Public Administration Capacity and Support for the EU: Before and After the Eurozone Crisis

Contents

Introduction

This research project aims to bring together theories of EU (European Union) integration and public administration policy capacity to scrutinise trends in popular support for the EU. Using Eurobarometer data and World Bank governance indicators, this project shall apply multiple linear regression analysis methods to longitudinal trends in Estonia and Sweden to gain insight into whether domestic public administration capacity influences support for the EU.

Literature Review

EU Legislative Process

With its vast scale and scope, the EU is a collective political and economic system like few others. Despite including traditional government branches — executive, legislative and judicial — it is not comparable to the 27 states which constitute its membership when considering the Union's lack of formal government. Rather, the EU is categorised as a 'system of governance' (McCormick, 2018, p299); its authority and responsibilities are shared over several institutions.

Simon Hix (1994) describes the EU as an 'internal political arena' in which not only member states deliberate and conflict, but so too do institutions and regulatory processes (Buonanno and Zahariadis, 2018, p2). Whilst other scholars label the EU either as federalist, confederal or something else (typically due to differences in definitions surrounding power balances and transfers/pooling of sovereignty), none of these change the reality that processes are dispersed amongst different EU institutions. Chief amongst them is the European Commission: the top executive responsible for managing EU law proposals and implementation. Proposals of whom go to the European Parliament, an elected chamber with representatives from across Europe, which power-shares with the Council of Ministers, a chamber of national government ministers from across Europe. The European Council, similarly, is composed of heads of states from across the EU. It concerns wider-scope strategies for Europe in a more contemporary intergovernmental fashion than other institutions. However, the institution with the largest reach and scope is the European Court of Justice, responsible for interpreting all EU law and founding treaties (McCormick, 2018, pp303-305).

Unlike traditional nation states, however, the EU does not implement its own policy. Whilst the main body for ensuring correct implementation is the European Commission, the EU itself does no 'on the ground' enforcement. This is instead the responsibility of constituent member states and their respective parliaments and public administrations. Member states may comply with EU law in different ways, but if obligations are not met, matters may be escalated to the European Court of Justice by the European Commission (Falkner, 2018, p324).

Legitimacy Crisis and Social Policy

As a regulatory governance body, the EU has pluralised authority amongst a range of actors, institutions and processes, both formal and informal. For instance, with a limited scope over certain policy areas, such as tax, education and health care (McCormick, 2018, p303), regulation in the EU comes via 'the removal of existing barriers' or 'an incremental construction of common rules, laws and standards', and rarely hyper-specific policy (Cagossi, 2018, p28). Of which requires the crossing of international borders and traditional state-level policy processes.

This above necessity of EU policymaking, as well as with institutional factors such as limited European Parliament power and a powerful nonelected body in the European Commission, make up the traditional argument on the EU's democratic deficit (Sánchez-Cuenca, 2017, p353).

The 2009 Eurozone crisis worsened the EU's democratic deficit markedly on multiple levels, most notably from the Union's response to the economic crisis. Inequality between EU states was exasperated by the EU's disproportionate punishment of irresponsible borrower-states vis-à-vis lender-states to stabilise the euro, with harsh austerity conditions (Sánchez-Cuenca, 2017, p361). One example that embodies this shift to neoliberalism is that: from 2010 to 2016, no social partner agreements were made via the European social dialogue (Vanhercke et al., 2020, p23).

From 2015, social policy remained limited in the EU, with anti-European parties gaining traction after the migrant crisis and the UK being the first member to leave the Union. The European Commission soon began to weigh the risks of limited social policy against wider EU integration deterioration and new President Jean-Claude Juncker promised a social dimension (ibid, p25).

2017 saw the adoption of the European Pillar of Social Rights, focused towards social and labour policy (ibid, pp25-28), and the consolidation of the Union's cohesion policy to, amongst other things, tackle poverty, inefficiencies in public administrations, invest in education and improve workplace conditions—especially in Central and Eastern European countries (Dudek, 2018, p89). The newest President in late 2019, Ursula von der Leyen, has built on this trend by supporting an enhanced European Pillar of Social Rights (von der Leyen, 2019).

Public Administration Policy Capacity

For public policy to be realised, it is required to be implemented effectively. Policies without effective work done in its development and implementation are simply empty ideas, never to gain traction. It is because of exactly this that executives and legislatures ultimately rely on public administrations for the majority of government work.

The public sector is inherently limited by what resources are available to them, both in efforts to shape policy in the policymaking stages and in efforts to implement them when delivering services. Peters (2015) highlights that technical knowledge and domain knowledge greatly impact the success of policy; training of political processes and organisational structures help actors to navigate effectively, and experience of real-world conditions helps policy proposals and civil servants to address root causes of issues (ibid, p220). These specifics may be useless or non-existent if, for instance, the correct coordinations are not in place, however. If consultations or deliberations are rare, or there exists no effective method to connect legislation to those who will be affected by it, policy success will be limited. Moreover, in systems with political interference in bureaucracies or generally unstable public administrations, policy scopes may narrow to unrepresentative and elite interests, and total policy implementation capacity may likely decrease significantly (Peters, 2015, pp220-225).

Theoretical Framework

This research project aims to combine the existing literature on the EU's legislative process, the EU's new legitimising strategies via social policy reform in light of the Eurozone crisis and public administration policy capacity theory. The remainer of this section shall attempt to build a cohesive theory of EU support in regards to differentiated EU law implementation across member states by marrying theories of European integration and public administration policy capacity theory.

As detailed above, the EU system of policymaking and regulatory governance is both ambiguous and pluralistic. The European project itself is characterised by overlapping domains, dispersed institutional processes and deliberation. In both theory and practice, for an EU government to implement all its own policy itself would be extremely difficult, given the literal continental scale and scope. As a result of pooled sovereignty, however, the EU can (and typically *must*) carry out policy implementation via its member sovereignties. Hence our first sub-hypothesis:

H_{1a} The EU relies on constituent member state parliaments and public administrations for the effective implementation of EU policy.

This transfer of power to an ambiguous political union is highlighted as one of the main criticisms of the EU. As has been realised in the rise of Europsceptic political parties, the EU is labelled as unaccountable and undemocratic (Sánchez-Cuenca, 2017, p359). In recent years, backlash at the EU's dominant 'technocratic' governance methods, austerity policies and neoliberal bias have only worsened the stains on its legitimacy (Sánchez-Cuenca, 2017, p356 and p359). Scholars agree that the EU can no longer take for granted its continued support amongst Europeans, as citizens and constituent states have demonstrated that the political will required for the transfer of power to a supranational body can be revoked if the utility of membership is deemed too little (Hobolt and de Vries, 2016). One such utility is that of social and labour policy, where, for instance, support for European integration is highest in countries with high wealth inequality and generally lower in states with established welfare systems (Brinegar and Jolly, 2005; Brinegar et al., 2004; Burgoon, 2009; Garry and Tilley, 2009 and 2015). This directly ties in to our second sub-hypothesis:

H_{1b} Support for the EU, particularly after the Eurozone crisis, is influenced by the utility of EU policy.

Policy is only as effective as those who implement it, as outlines Peters (2015). Resources, coordination efforts, control on corruption and political inference greatly define how policy is drafted and realised. Strong public sectors can translate government policy effectively and provide the foundation for future proposals, whilst weaker ones do the very opposite. Finally, considering the different levels of public administration capabilities and structures across EU member states, our main hypothesis can be derived from the following:

H_{1c} The capacity of state governments and public administrations influence the quality of public policy.

H_1 Support for the EU is influenced by the capacity of constituent member states' public administrations.

Data and Measurement

This research project shall make use of multiple linear regression using time series datasets. The dependent variable we are aiming to predict is support for the EU, this is to be captured by the Eurobarometer. This is a bi-annual survey conducted in every EU member state and some periphery countries concerning social, economic and political issues in Europe. One of the most consistent questions in the survey asks respondents about whether membership of the EU for their respective countries is good or bad, with an ordinal response list from 1-4. It allows for longitudinal trends in attitudes towards the EU to be captured by country (EB, nd). The data used here is to only show the positive responses as a percentage of the total response rate, with 100% being completely positive responses and 0% being none at all. This comprises one of the four previously mentioned ordinal responses, typically coded as '1' ('good'). All other responses are either negative, neutral or no response; these remainer responses are ignored for this analysis.

The independent variables for this analysis come from the World Bank's Worldwide Governance Indicators: a percentile score for all countries regarding the quality of government (with 100% being the most effective country in the world, and 0% the least). For this, the World Bank aggregates scores from over 30 expert thinktanks and international organisations for a publication annually (World Bank, 2023). This research project shall make use of five of its six dimensions: voice and accountability, government effectiveness, regulatory quality, rule of law and control of corruption.

The case studies for this research project shall include one 'established' EU member state and one 'establishing' EU member state. That is to say, the established case study is to demonstrate relatively high-quality and stable public administration capacity, whilst the establishing case aims to focus on a state which is trending upwards in this regard. This will allow for a comparison between EU support in improving countries and EU support in established countries as well as other inferences that may be able to be captured from their individual study.

An ideal candidate for the latter is an EU-expansion state, Estonia, which in 2003 had a public administration characterised by lack of trust, lack of coordination and immaturity in only recently gaining independence as a former Soviet state (Drechsler, 2004, p. 390; Sarapuu and Saarniit, 2020, p317). As in many other states, New Public Management dominated Estonia for much of the 1990s, 2000s and 2010s and public administration higher education expanded. Whilst this encouraged a merit-bases system, it was in 2011 that Estonia began reforms to centralise and coordinate public administration efforts with EU structural funds on the back of a critical OECD report (Sarapuu and Saarniit, 2020, pp323-324). The Baltic state now scores highly on indicators such as government effectiveness, public investment and government employment as a percentage of total employment (Mackie et al., 2020).

Sweden is to be used as an established case; it has a long tradition of strong public investment and services, robust governance practices and a generous welfare state. Although aspects are decentralised, such as government employment and ministries, policy coordination and consensus-building ensure a responsive and active public administration (OECD, 2023, pp 11-24).

Whereas establishing states may seek EU membership to enhance domestic welfare systems, established states, such as Sweden, may view Europeanisation as supranational

overreach at risk of liberalising socialised institutions, such as welfare systems (Hobolt and de Vries, 2016, p420). As such, the below typology provides a basis for the case study selection.

Table 1: Typology of EU Support and Public Administration Capacity

	Less EU Support	More EU Support
Weaker Public Admins.	I	II Estonia
Stronger Public Admins.	III Sweden	IV

As laid out in the literature review above, EU legitimising strategies and approaches to social policy changed after the Eurozone crisis. Therefore, analysis shall be conducted before and after 2009. Analysis starts in 2004, which is when Estonia joined the EU, to 2022. This will help to pick out and separate differences in trends in support for the EU that are potentially influenced by dominant outside factors, such as the 2009 Eurozone crisis, 2015 migrant crisis and 2020 covid-19 pandemic.

Although the legislative cycle in the EU is not instant, and policy implementation and its effects are not realised immediately also, the research project favours adding a one-year lag to the dataset, specifically the dependent variable. For example, to view the effects of governance effectiveness scores in 2006, support for the EU in the next year 2007 would be examined. Although this would be ideal, the limited observations from this time series analysis would suffer from removing an entire year's worth of valuable data. This research project recognises this as a notable limitation.

Analysis

The primary hypothesis for this research project concerns the rate of change on EU support in Estonia from the beginning of its membership to the near-present. Not only will findings from the analysis uncover trends in Estonia alone, but it will also allow for insights into Estonia in a comparative sense when compared to Sweden. Both countries show upward trends

in support for the EU since 2004, see figure 1, despite major events potentially damaging the Union.

Figure 1: EU Support in Estonia and Sweden
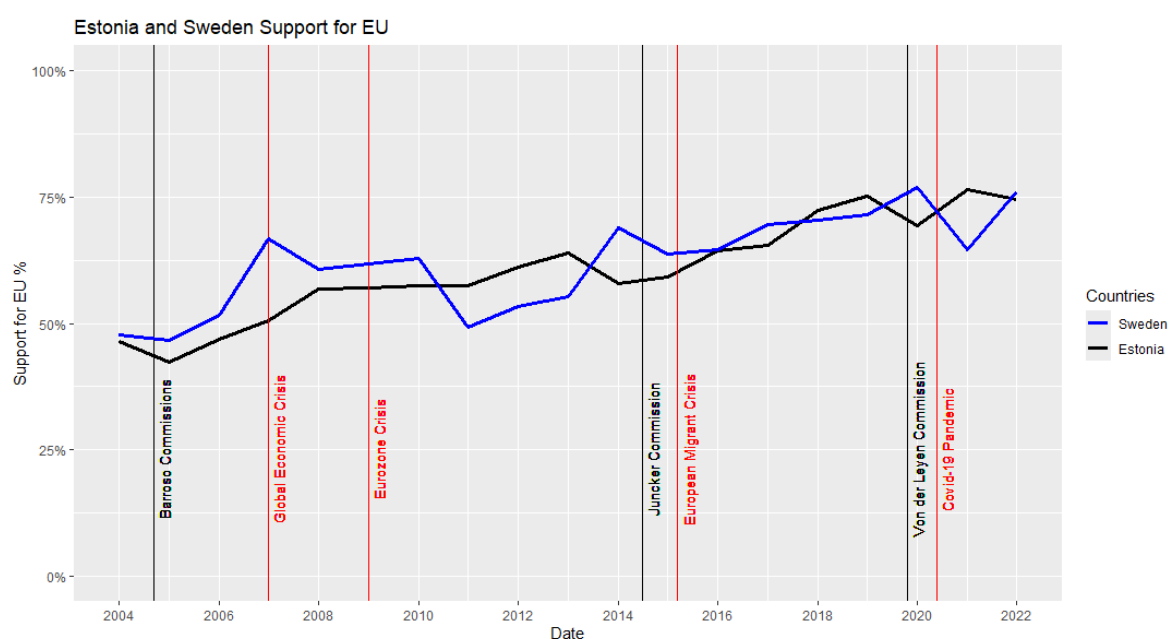
As seen in table 2 below, a model which includes five governance predictor variables for EU support in Estonia includes no statistically significant findings ($p > 0.05$), meaning that the results are outwith our 95% confidence interval (used to determine if a trend happened by chance or not). Therefore, this model fails to reject the null hypothesis that as public administration capacity increases (or decreases), the rate of change in support for the EU in Estonia remains unaffected. However, the results here are perhaps unsurprising considering the multifaceted nature of support for EU integration and the turbulent period from 2004 to 2022 which also affected views towards the EU. Such as the Eurozone crisis, migrant crisis and covid-19 pandemic.

Table 2: Governance Indicators World-Wide Percentile on Support for EU in Estonia (2004-2022)

	Dependent variable: Support for EU %, Eurobarometer			
	Estimate	Std. Error	T-value	P-value
Intercept	-155.4099	72.0451	-2.157	0.0503
Governance Effectiveness	0.5871	0.8287	0.708	0.4912
Regulatory Quality	0.4725	2.7124	0.174	0.8644
Control of Corruption	0.7793	0.8071	0.966	0.3519
Voice and Accountability	-0.1437	1.9731	-0.073	0.9431
Rule of Law	0.8458	1.0840	0.780	0.4492
Adjusted R-Squared	0.5129			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

EU Support in Sweden, however, partially follows the typology outlined in table 1. Table 3 demonstrates that for every positive unit of change in governance effectiveness world-wide percentile rank in Sweden, support for the EU drops by 2.17%. In the context of established states being wary of supranational overreach into domestic welfare systems, this finding remains theoretically sound. It is statistically significant ($p<0.05$), meaning—at least for the governance effectiveness indicator alone—we can reject the null hypothesis that as governance effectiveness decreases (or increases), there is no change in support for the EU in Sweden. However, another statistically significant finding suggests that our working typology is too shallow. It was found that as regulatory quality percentile score increases, EU support in Sweden increases by 3.28%. This overall model accounts for 62% of variation in EU support in Sweden, albeit with majority of statistically insignificant predictors.

Table 3: Governance Indicators World-Wide Percentile on Support for EU in Sweden (2004-2022)

	Dependent variable: Support for EU %, Eurobarometer			
	Estimate	Std. Error	T-value	P-value
Intercept	-147.0845	375.1989	-0.392	0.70140
Governance Effectiveness	-2.1785	0.8287	-2.515	0.02587 *
Regulatory Quality	3.2894	1.0640	3.092	0.00859 **
Control of Corruption	5.1169	4.1037	1.247	0.23444
Voice and Accountability	-1.1833	2.6702	-0.443	0.66494
Rule of Law	-2.9085	1.9697	-1.477	0.16358
Adjusted R-Squared	0.6221			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Before the Eurozone crisis, Estonian support for the EU shows no statistically significant relationship with governance indicators, as seen in table 4. This means that for the period from 2004 to 2008, we fail to reject the null hypothesis that variations in governance indicators from Estonia have no effect on support for the EU.

Only governance effectiveness and regulatory quality are used for the multiple linear regression models between 2004 and 2008, as including all variables means the models have equal number of variables as observations, which cannot generate findings. These kept variables relate most closely to the subject matter of this project.

Table 4: Select Governance Indicators World-Wide Percentile on Support for EU in Estonia (2004-2008)

		Dependent variable: Support for EU %, Eurobarometer		
	Estimate	Std. Error	T-value	P-value
Intercept	-134.7659	737.9677	-0.183	0.872
Governance Effectiveness	1.6624	8.9317	0.186	0.870
Regulatory Quality	0.6123	16.3847	0.037	0.974
Adjusted R-Squared	-0.3209			

* p < 0.05, ** p < 0.01, *** p < 0.001

Much is the same for Sweden, demonstrated by table 5, in that before the Eurozone crisis, variations in governance indicators show no impact on support for the EU. Therefore, we fail to reject its null hypothesis.

Table 5: Select Governance Indicators World-Wide Percentile on Support for EU in Sweden (2004-2008)

		Dependent variable: Support for EU %, Eurobarometer		
	Estimate	Std. Error	T-value	P-value
Intercept	-90.496	258.329	-0.350	0.760
Governance Effectiveness	-1.202	3.993	-0.301	0.792
Regulatory Quality	2.734	3.260	0.839	0.490
Adjusted R-Squared	-0.3564			

* p < 0.05, ** p < 0.01, *** p < 0.001

Whilst Estonian support for the EU declined after the Eurozone crisis, it soon increased again markedly in 2014 at 69% then again to 76% in 2020 and 2022. Table 6 gives evidence that control over corruption in Estonia's domestic public administration played a statistically significant ($p<0.05$) role in influencing EU support. It was found that for every percentile change in Estonia's control over corruption score compared world-wide, support for the EU increased by 2.02%. We can reject the null hypothesis that changes in control over corruption in Estonia after the Eurozone crisis have no effect on EU support. Together with other, though not statistically significant, predictors, this model accounts for 63.92% of variation in support for the EU in Estonia post-Crisis.

Table 6: Governance Indicators World-Wide Percentile on Support for EU in Estonia (2009-2022)

		Dependent variable: Support for EU %, Eurobarometer		
	Estimate	Std. Error	T-value	P-value
Intercept	125.4301	139.4756	0.899	0.3948
Governance Effectiveness	0.5121	0.7617	0.672	0.5203
Regulatory Quality	-0.5341	3.0088	-0.178	0.8635
Control of Corruption	2.0213	0.8099	2.496	0.0372 *
Voice and Accountability	-1.2030	1.8688	-0.644	0.5378
Rule of Law	-1.4300	1.7411	-0.821	0.4352
Adjusted R-Squared	0.6392			

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 7 also reports a statistically significant (p<0.05) finding after the Eurozone crisis. In Sweden, this model found that for unit decreases in world-wide percentile scores for rule of law, support for the EU decreases by 4.68%, in a model as a whole that accounts for 70% of variation in EU support. Whilst not inline with the earlier typology, we are able to reject the null hypothesis that decreases in rule of law scores in Sweden have no effect on support for the EU. However, in regard to rising Euroscepticism in Sweden off the back of the 2015 migrant crisis and rising crime rates amongst asylum seekers as a proportion of the country's population (Adamson, 2020), the finding here would soundly fit in the wider literature.

Table 7: Governance Indicators World-Wide Percentile on Support for EU in Sweden (2009-2022)

		Dependent variable: Support for EU %, Eurobarometer		
	Estimate	Std. Error	T-value	P-value
Intercept	-423.6195	515.8636	-0.821	0.4353
Governance Effectiveness	-2.5528	1.2490	-2.044	0.0752
Regulatory Quality	1.2700	1.0328	1.230	0.2538
Control of Corruption	11.4591	6.5272	1.756	0.1172
Voice and Accountability	-0.5786	2.1794	-0.265	0.7973
Rule of Law	-4.6893	1.7842	-2.628	0.0303 *
Adjusted R-Squared	0.7068			

* p < 0.05, ** p < 0.01, *** p < 0.001

Conclusion and Recommendations

Estonia and Sweden both have statistically significant findings but all in different governance effectiveness indicators, which suggests that the simple typology derived from this research project's literature review and theoretical framework requires expansion.

From 2004 to 2022, it was found that governance indicators—specifically governance effectiveness and regulatory quality—were greater predictors of support for the EU in Sweden

than in Estonia. Closer inspection revealed that before the Eurozone crisis, neither Sweden or Estonia featured statistically significant relationships between EU support and public administration capacity indicators. After the Crisis, however, notable predictors for increased EU support and decreased EU support, respectively, were found. Modernisation and state-consolidation efforts in Estonia's civil service have suppressed corruption in the Baltic state after independence. Following this project's theoretical framework, this has allowed for greater implementation of EU legitimising policies, such as decreased income inequality via stronger institutions. In Sweden, rule of law concerns together with recent crime statistics demonstrated a negative correlation with EU support where, as theory suggests, regressing utility of EU membership may be undermining domestic structures.

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Appendix

Notes for data sourcing

data collected to be from 2004 - 2022(inclusive): Estonia joinedin 2004. EB good/bad data not available for 2023 & 2024.

for 'membership good/bad' variable column, see: https://www.gesis.org/en/eurobarometer-data-service/search-data-access/eb-trends-trend-files/list-of-trends/membership-goodbad

for list of Standard EBs, see: https://www.gesis.org/fileadmin/upload/dienstleistung/daten/umfragedaten/eurobarometer/eb_standard/standardEB_overview.pdf

for finding download links to Standard EBs, see: https://www.gesis.org/en/eurobarometer-data-service/survey-series/standard-special-eb/study-overview

List of EBs & variable name:

#2004	61	Q.8	var [estonia not included, not using]
#2004	62	Q.11	var [not available]
#2004	62.2	Q.A1	var x
#2005	63.4	Q.A8A	var x
#2005	64.2	Q.A8A	var x
#2006	65.1	Q.A7	var x
#2006	65.2	Q.A11A	var x
#2006	66.1	Q.A7A	var x
#2007	67.2	Q.A9A	var x
#2007	68.1	Q.A12A	[no variable report]
#2008	69.2	Q.A7A	var x
#2008	70.1	Q.A9A	var x
#2009	71.1	Q.A6A	var x
#2009	71.3	Q.A6A	var x
#2009	72.4	Q.A7A	var x
#2010	73.4	Q.A9A	var x
#2010	74.2	Q.A10C	var x
#2011	75.3	QA10C	var x
#2012	77.4	QP23	var x

```
#2013  79.5          QP22    var x

#2013  80.1          QA7A    var [ dont have]

#2014  82.4          QP13    var x

#2015  84.1          Q20    var x

#2016  86.1          QA12    var x

#2017  88.1          QA10    var x

#2018  89.2          QA23   var x

#2018  90.1          QA15    dta x

#2019  91.1          QA11    dta x

#2019  91.5          QF1    dta x

#2019  92.2          QB12    dta x

#2020  94.1          QA26    dta x

#2020  94.2          QA9    dta x

#2021  96.1          D21    dta x

#2021  96.2          QA7    dta x

#2022  97.3          QA7    dta x

# x = downloaded2019


#### Notes about analysis ####


# we are collecting % of 'good thing' answers only

# countries collected will be Estonia (EE) and Sweden (SE)

# EB has 1-3 observations each year, and world bank has only 1, so EBs will be aggregated
together to represent one year.


rm(list=ls())

options(scipen=999)


#### Libraries ####


library(ggplot2)
```

```r
library(haven)

library(dplyr)

library(tidyr)

library(foreign)

library(scales)


#### Functions ####


filter_estonia <- function(data, col, row) { # dataset (eb version), column where unique country
tag is, column where 'membership good/bad' question is

  data <- filter(data, !!sym(col)=="EE")

  data <- select(data, !!sym(row))

  return(data)

}


filter_sweden <- function(data, col, row) { # dataset (eb version), column where unique country
tag is, column where 'membership good/bad' question is

  data <- filter(data, !!sym(col)=="SE")

  data <- select(data, !!sym(row))

  return(data)

}


find_good_percentage <- function(data, col) {

  data <- drop_na(data)

  total <- NROW(data)

  #good_count_raw <- data[data[[col]]==1, ] # be sure to check that 'good thing' coded as 1 is
consistent across all datasets.

  good_count <- sum(data[[col]]==1, na.rm=TRUE)

  #good_count <- nrow(good_count_raw)

  good_percentage <- good_count / total * 100

  return (good_percentage)

}
```

```r
find_eb_average <- function(percentage1, percentage2) { #eg: se_2008a, se_2008b

  avg <- (percentage1 + percentage2) / 2

  return(avg)

}
```

Code

```r
setwd("C:/Users/Aidan/Documents/Files/University/Strathclyde/Semester 2/Quantitative
Methods/Research Project/Project/EB Data")


# file imports


eb_2018b <- read_dta("2018b.dta")

eb_2019a <- read_dta("2019a.dta")

eb_2019b <- read_dta("2019b.dta")

eb_2019c <- read_dta("2019c.dta")

eb_2020a <- read_dta("2020a.dta")

eb_2020b <- read_dta("2020b.dta")

eb_2021a <- read_dta("2021a.dta")

eb_2021b <- read_dta("2021b.dta")

eb_2022a <- read_dta("2022a.dta")
var <- read.csv("var.csv")


#### processing data ####


## filtering


ee_2018b <- filter_estonia(eb_2018b, 'isocntry', 'qa15')
se_2018b <- filter_sweden(eb_2018b, 'isocntry', 'qa15')
```

```r
ee_2019a <- filter_estonia(eb_2019a, 'isocntry', 'qa11')
se_2019a <- filter_sweden(eb_2019a, 'isocntry', 'qa11')


ee_2019b <- filter_estonia(eb_2019b, 'isocntry', 'qf1')
se_2019b <- filter_sweden(eb_2019b, 'isocntry', 'qf1')


ee_2019c <- filter_estonia(eb_2019c, 'isocntry', 'qb12')
se_2019c <- filter_sweden(eb_2019c, 'isocntry', 'qb12')


ee_2020a <- filter_estonia(eb_2020a, 'isocntry', 'qa26')
se_2020a <- filter_sweden(eb_2020a, 'isocntry', 'qa26')


ee_2020b <- filter_estonia(eb_2020b, 'isocntry', 'qa9')
se_2020b <- filter_sweden(eb_2020b, 'isocntry', 'qa9')


ee_2021a <- filter_estonia(eb_2021a, 'isocntry', 'd21')
se_2021a <- filter_sweden(eb_2021a, 'isocntry', 'd21')


ee_2021b <- filter_estonia(eb_2021b, 'isocntry', 'qa7')
se_2021b <- filter_sweden(eb_2021b, 'isocntry', 'qa7')


ee_2022a <- filter_estonia(eb_2022a, 'isocntry', 'qa7')
se_2022a <- filter_sweden(eb_2022a, 'isocntry', 'qa7')

## finding good %
ee_2018b_goods <- find_good_percentage(ee_2018b, 'qa15')
se_2018b_goods <- find_good_percentage(se_2018b, 'qa15')


ee_2019a_goods <- find_good_percentage(ee_2019a, 'qa11')
se_2019a_goods <- find_good_percentage(se_2019a, 'qa11')
```

```r
ee_2019b_goods <- find_good_percentage(ee_2019b, 'qf1')
se_2019b_goods <- find_good_percentage(se_2019b, 'qf1')


ee_2019c_goods <- find_good_percentage(ee_2019c, 'qb12')
se_2019c_goods <- find_good_percentage(se_2019c, 'qb12')


ee_2020a_goods <- find_good_percentage(ee_2020a, 'qa26')
se_2020a_goods <- find_good_percentage(se_2020a, 'qa26')


ee_2020b_goods <- find_good_percentage(ee_2020b, 'qa9')
se_2020b_goods <- find_good_percentage(se_2020b, 'qa9')


ee_2021a_goods <- find_good_percentage(ee_2021a, 'd21')
se_2021a_goods <- find_good_percentage(se_2021a, 'd21')


ee_2021b_goods <- find_good_percentage(ee_2021b, 'qa7')
se_2021b_goods <- find_good_percentage(se_2021b, 'qa7')


ee_2022a_goods <- find_good_percentage(ee_2022a, 'qa7')
se_2022a_goods <- find_good_percentage(se_2022a, 'qa7')

#### finding god in var (archive report) ####
var
ee_2004_goods <- filter(var, year=="2004")
ee_2004_goods <- select(ee_2004_goods, EE)


se_2004_goods <- filter(var, year=="2004")
se_2004_goods <- select(se_2004_goods, SE)


#--
```

```r
ee_2005_goods <- filter(var, year=="2005")
ee_2005_goods <- select(ee_2005_goods, EE)


se_2005_goods <- filter(var, year=="2005")
se_2005_goods <- select(se_2005_goods, SE)


#--


ee_2006_goods <- filter(var, year=="2006")
ee_2006_goods <- select(ee_2006_goods, EE)


se_2006_goods <- filter(var, year=="2006")
se_2006_goods <- select(se_2006_goods, SE)


#--


ee_2007_goods <- filter(var, year=="2007")
ee_2007_goods <- select(ee_2007_goods, EE)


se_2007_goods <- filter(var, year=="2007")
se_2007_goods <- select(se_2007_goods, SE)


#--


ee_2008_goods <- filter(var, year=="2008")
ee_2008_goods <- select(ee_2008_goods, EE)


se_2008_goods <- filter(var, year=="2008")
se_2008_goods <- select(se_2008_goods, SE)
```

```r
#--

ee_2009_goods <- filter(var, year=="2009")
ee_2009_goods <- select(ee_2009_goods, EE)


se_2009_goods <- filter(var, year=="2009")
se_2009_goods <- select(se_2009_goods, SE)


#--

ee_2010_goods <- filter(var, year=="2010")
ee_2010_goods <- select(ee_2010_goods, EE)


se_2010_goods <- filter(var, year=="2010")
se_2010_goods <- select(se_2010_goods, SE)


#--

ee_2011_goods <- filter(var, year=="2011")
ee_2011_goods <- select(ee_2011_goods, EE)


se_2011_goods <- filter(var, year=="2011")
se_2011_goods <- select(se_2011_goods, SE)


#--

ee_2012_goods <- filter(var, year=="2012")
ee_2012_goods <- select(ee_2012_goods, EE)


se_2012_goods <- filter(var, year=="2012")
se_2012_goods <- select(se_2012_goods, SE)
```

```
#--

ee_2013_goods <- filter(var, year=="2013")
ee_2013_goods <- select(ee_2013_goods, EE)


se_2013_goods <- filter(var, year=="2013")
se_2013_goods <- select(se_2013_goods, SE)


#--

ee_2014_goods <- filter(var, year=="2014")
ee_2014_goods <- select(ee_2014_goods, EE)


se_2014_goods <- filter(var, year=="2014")
se_2014_goods <- select(se_2014_goods, SE)


#--

ee_2015_goods <- filter(var, year=="2015")
ee_2015_goods <- select(ee_2015_goods, EE)


se_2015_goods <- filter(var, year=="2015")
se_2015_goods <- select(se_2015_goods, SE)


#--

ee_2016_goods <- filter(var, year=="2016")
ee_2016_goods <- select(ee_2016_goods, EE)


se_2016_goods <- filter(var, year=="2016")
```

```r
se_2016_goods <- select(se_2016_goods, SE)


#--


ee_2017_goods <- filter(var, year=="2017")
ee_2017_goods <- select(ee_2017_goods, EE)


se_2017_goods <- filter(var, year=="2017")
se_2017_goods <- select(se_2017_goods, SE)


#--


ee_2018a_goods <- filter(var, year=="2017")
ee_2018a_goods <- select(ee_2017_goods, EE)


se_2018a_goods <- filter(var, year=="2018")
se_2018a_goods <- select(se_2018a_goods, SE)




#### finding averages ####


## averages with 2 instances per year from dta files
# 2021, 2020, 2018 (one is from avr file)
ee_2021_avg <- find_eb_average(ee_2021a_goods, ee_2021b_goods)
ee_2020_avg <- find_eb_average(ee_2020a_goods, ee_2020b_goods)
ee_2018a_goods <- as.numeric(ee_2018a_goods)
ee_2018_avg <- find_eb_average(ee_2018a_goods, ee_2018b_goods)


se_2021_avg <- find_eb_average(se_2021a_goods, se_2021b_goods)
```

```r
se_2020_avg <- find_eb_average(se_2020a_goods, se_2020b_goods)

se_2018a_goods <- as.numeric(se_2018a_goods)

se_2018_avg <- find_eb_average(se_2018a_goods, se_2018b_goods)


# averages with 2 in avr file: 2010, 2008, 2005

ee_2005_avg <- mean(ee_2005_goods$EE)

ee_2008_avg <- mean(ee_2008_goods$EE)

ee_2010_avg <- mean(ee_2010_goods$EE)


se_2005_avg <- mean(se_2005_goods$SE)

se_2008_avg <- mean(se_2008_goods$SE)

se_2010_avg <- mean(se_2010_goods$SE)


## averages with 3 instances per year, all from avr file

# 2006, 2009

ee_2006_avg <- mean(ee_2006_goods$EE)

ee_2009_avg <- mean(ee_2009_goods$EE)


se_2006_avg <- mean(se_2006_goods$SE)

se_2009_avg <- mean(se_2009_goods$SE)


# dta files with 3 instances per year to avg

ee_2019_avg <- (ee_2019a_goods + ee_2019b_goods + ee_2019c_goods) / 3

se_2019_avg <- (se_2019a_goods + se_2019b_goods + se_2019c_goods) / 3


## others, making numeric (2017, 2016, 2015, 2014, 2013, 2012, 2011, 2007, 2004)

ee_2022_avg <- as.numeric(ee_2022a_goods)

ee_2017_avg <- as.numeric(ee_2017_goods)

ee_2016_avg <- as.numeric(ee_2016_goods)

ee_2015_avg <- as.numeric(ee_2015_goods)

ee_2014_avg <- as.numeric(ee_2014_goods)
```

```
ee_2013_avg <- as.numeric(ee_2013_goods)

ee_2012_avg <- as.numeric(ee_2012_goods)

ee_2011_avg <- as.numeric(ee_2011_goods)

ee_2007_avg <- as.numeric(ee_2007_goods)

ee_2004_avg <- as.numeric(ee_2004_goods)


se_2022_avg <- as.numeric(se_2022a_goods)

se_2017_avg <- as.numeric(se_2017_goods)

se_2016_avg <- as.numeric(se_2016_goods)

se_2015_avg <- as.numeric(se_2015_goods)

se_2014_avg <- as.numeric(se_2014_goods)

se_2013_avg <- as.numeric(se_2013_goods)

se_2012_avg <- as.numeric(se_2012_goods)

se_2011_avg <- as.numeric(se_2011_goods)

se_2007_avg <- as.numeric(se_2007_goods)

se_2004_avg <- as.numeric(se_2004_goods)


#### putting values into list ####


ee_eb <- list(ee_2004_avg, ee_2005_avg, ee_2006_avg, ee_2007_avg, ee_2008_avg,
ee_2009_avg, ee_2010_avg,

      ee_2011_avg, ee_2012_avg, ee_2013_avg, ee_2014_avg, ee_2015_avg, ee_2016_avg,
ee_2017_avg,

      ee_2018_avg, ee_2019_avg, ee_2020_avg, ee_2021_avg, ee_2022_avg)




se_eb <- list(se_2004_avg, se_2005_avg, se_2006_avg, se_2007_avg, se_2008_avg,
se_2009_avg, se_2010_avg,

      se_2011_avg, se_2012_avg, se_2013_avg, se_2014_avg, se_2015_avg, se_2016_avg,
se_2017_avg,

      se_2018_avg, se_2019_avg, se_2020_avg, se_2021_avg, se_2022_avg)
```

```
#### importing governance data ####


govn <- read.csv("P_Data_Extract_From_Worldwide_Governance_Indicators.csv")


# va: voice and accountability, rl: rule of law, rq: regulatory quality, ge: government
effectiveness, cc: control of corruption.


ee_va <- filter(govn, Series.Code=="VA.PER.RNK")

ee_va <- filter(ee_va, Country.Code=="EST")

ee_va <- select(ee_va, X2004..YR2004.:X2022..YR2022.)

ee_va <- gather(ee_va)

ee_va <- select(ee_va, value)


ee_rl <- filter(govn, Series.Code=="RL.PER.RNK")

ee_rl <- filter(ee_rl, Country.Code=="EST")

ee_rl <- select(ee_rl, X2004..YR2004.:X2022..YR2022.)

ee_rl <- gather(ee_rl)

ee_rl <- select(ee_rl, value)


ee_rq <- filter(govn, Series.Code=="RQ.PER.RNK")

ee_rq <- filter(ee_rq, Country.Code=="EST")

ee_rq <- select(ee_rq, X2004..YR2004.:X2022..YR2022.)

ee_rq <- gather(ee_rq)

ee_rq <- select(ee_rq, value)


ee_ge <- filter(govn, Series.Code=="GE.PER.RNK")

ee_ge <- filter(ee_ge, Country.Code=="EST")

ee_ge <- select(ee_ge, X2004..YR2004.:X2022..YR2022.)

ee_ge <- gather(ee_ge)

ee_ge <- select(ee_ge, value)
```

```r
ee_cc <- filter(govn, Series.Code=="CC.PER.RNK")
ee_cc <- filter(ee_cc, Country.Code=="EST")
ee_cc <- select(ee_cc, X2004..YR2004.:X2022..YR2022.)
ee_cc <- gather(ee_cc)
ee_cc <- select(ee_cc, value)


#-


se_va <- filter(govn, Series.Code=="VA.PER.RNK")
se_va <- filter(se_va, Country.Code=="SWE")
se_va <- select(se_va, X2004..YR2004.:X2022..YR2022.)
se_va <- gather(se_va)
se_va <- select(se_va, value)


se_rl <- filter(govn, Series.Code=="RL.PER.RNK")
se_rl <- filter(se_rl, Country.Code=="SWE")
se_rl <- select(se_rl, X2004..YR2004.:X2022..YR2022.)
se_rl <- gather(se_rl)
se_rl <- select(se_rl, value)


se_rq <- filter(govn, Series.Code=="RQ.PER.RNK")
se_rq <- filter(se_rq, Country.Code=="SWE")
se_rq <- select(se_rq, X2004..YR2004.:X2022..YR2022.)
se_rq <- gather(se_rq)
se_rq <- select(se_rq, value)


se_ge <- filter(govn, Series.Code=="GE.PER.RNK")
se_ge <- filter(se_ge, Country.Code=="SWE")
se_ge <- select(se_ge, X2004..YR2004.:X2022..YR2022.)
se_ge <- gather(se_ge)
```

```r
se_ge <- select(se_ge, value)


se_cc <- filter(govn, Series.Code=="CC.PER.RNK")

se_cc <- filter(se_cc, Country.Code=="SWE")

se_cc <- select(se_cc, X2004..YR2004.:X2022..YR2022.)

se_cc <- gather(se_cc)

se_cc <- select(se_cc, value)




##### Analysing prep
# working variables



ee_eb

se_eb


nrow(ee_va)

ee_rl

ee_rq

ee_ge

ee_cc


se_va

se_rl

se_rq

se_ge

se_cc


# including time in EB scores
```

```r
time_scale <- list('2004', '2005', '2006', '2007', '2008', '2009', '2010', '2011', '2012', '2013', '2014', '2015', '2016',
          '2017', '2018', '2019', '2020', '2021', '2022')

time_scale <- as.numeric(time_scale)


ee_eb <- as.numeric(ee_eb)

ee_eb <- data.frame(date=time_scale, score=ee_eb)


se_eb <- as.numeric(se_eb)

se_eb <- data.frame(date=time_scale, score=se_eb)



ee_eb_all_govt <- cbind(ee_eb, setNames(ee_va, 'va'), setNames(ee_rl, 'rl'),
          setNames(ee_rq, 'rq'), setNames(ee_ge, 'ge'), setNames(ee_cc, 'cc'))


se_eb_all_govt <- cbind(se_eb, setNames(se_va, 'va'), setNames(se_rl, 'rl'),
          setNames(se_rq, 'rq'), setNames(se_ge, 'ge'), setNames(se_cc, 'cc'))


#### Analysis


### Linear Models



## Estonia
# total


ee_total <- lm(score ~ ge + rq + cc + va + rl, data=ee_eb_all_govt)

summary(ee_total)


# 2004 - 2009(not including)
```

```
ee_before_crisis <- lm(score ~ ge + rq + cc + va + rl, data=subset(ee_eb_all_govt, date >= 2004 &
date <= 2008))
```

I think this doesn't work because we have equal amount of predictor variables and
observations. # For this we'll just use GE and RQ, since those are most closely related to public
policy itself, and not a wider political or socio-economic system.

```
summary(ee_before_crisis)
```


```
ee_before_crisis2 <- lm(score ~ ge + rq, data=subset(ee_eb_all_govt, date >= 2004 & date <=
2008))
```

```
summary(ee_before_crisis2)
```


2009(including) - 2022


```
ee_after_crisis <- lm(score ~ ge + rq + cc + va + rl, data=subset(ee_eb_all_govt, date >= 2009 &
date <= 2022))
```

```
summary(ee_after_crisis)
```


Sweden

total


```
se_total <- lm(score ~ ge + rq + cc + va + rl, data=se_eb_all_govt)
```

```
summary(se_total)
```


2004 - 2009(not including)


```
se_before_crisis2 <- lm(score ~ ge + rq, data=subset(se_eb_all_govt, date >= 2004 & date <=
2008))
```

```
summary(se_before_crisis2)
```

```
# 2009(including) - 2022


se_after_crisis <- lm(score ~ ge + rq + cc + va + rl, data=subset(se_eb_all_govt, date >= 2009 &
date <= 2022))

summary(se_after_crisis)




### Linear Models End




#### Graphs


estonia_test <- data.frame(t(ee_eb))


colnames(estonia_test) <- estonia_test[1, ]


ee_col <- c('EE', 'EE')


estonia_test <- cbind(New_Column_Name = ee_col, estonia_test)


sweden_test <- data.frame(t(se_eb))

colnames(sweden_test) <- sweden_test[1, ]

se_col <- c('SE', 'SE')

sweden_test <- cbind(New_Col_Name = se_col, sweden_test)
```

```r
current_estonia_names <- colnames(estonia_test)

current_estonia_names[1] <-'Country'

colnames(estonia_test) <- current_estonia_names


current_sweden_names <- colnames(sweden_test)

current_sweden_names[1] <-'Country'

colnames(sweden_test) <- current_sweden_names


both_test_2 <- rbind(estonia_test, sweden_test)


# graph


plot1 <- ggplot(data=se_eb_all_govt, aes(x=date, y=score / 100)) +

 geom_line(aes(color='blue'), size=1.2) +

 scale_y_continuous(labels = percent, limits = c(0, 1)) +

 scale_x_continuous(breaks = scales::pretty_breaks(n = 14)) +

 geom_vline(xintercept = 2009, colour='red') +

 geom_text(aes(x=2009, label="\nEurozone Crisis", y=.25), colour="red", angle=90, size=3.5) +

 geom_vline(xintercept = 2007, colour='red') +

 geom_text(aes(x=2007, label="\nGlobal Economic Crisis", y=.25), colour="red", angle=90,
size=3.5) +

 geom_vline(xintercept = 2020.4, colour='red') +

 geom_text(aes(x=2015.2, label="\nEuropean Migrant Crisis", y=.25), colour="red", angle=90,
size=3.5) +

 geom_vline(xintercept = 2015.2, colour='red') +

 geom_text(aes(x=2020.4, label="\nCovid-19 Pandemic", y=.25), colour="red", angle=90,
size=3.5) +

 geom_vline(xintercept = 2004.7) +

 geom_text(aes(x=2004.7, label="\nBarroso Commissions", y=.25), colour="black", angle=90,
size=3.5) +

 geom_vline(xintercept = 2014.5) +

 geom_text(aes(x=2014.5, label="\nJuncker Commission", y=.25), colour="black", angle=90,
size=3.5) +
```

```r
  geom_vline(xintercept = 2019.8) +

  geom_text(aes(x=2019.8, label="\nVon der Leyen Commission", y=.25), colour="black",
angle=90, size=3.5)


plot1 <- plot1 + geom_line(data=ee_eb_all_govt, aes(x=date, y=score / 100, colour='black'),
size=1.2) +

  labs(x = "Date", y = "Support for EU %", title = "Estonia and Sweden Support for EU")


plot1 <- plot1 + scale_color_manual(name='Countries', values=c('blue', 'black'),
labels=c('Sweden', 'Estonia'))


plot1
```