The Effects of Decriminalization of Drug Use in Portugal

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Portugal's Law 30/2000

Introduction

- **Effective Date:** July 2001

- **Key Change:** Decriminalization of drug use, possession, and acquisition for personal use (up to 10 days' supply).

Key Features

- **Ending Penal Sanctions:**
  - Prior: fines or up to 1 year in prison for possession.
  - Now: no penal sanctions for personal possession.
- **Referral System:**
  - Introduction of Commissions for the Dissuasion of Drug Addiction.
  - Commissions consist of social workers, legal advisors, and medical professionals.

Process of Drug Users

- **Police Referral:** Individuals found with drugs are referred to CDDAs.
- **Appearance:** Users appear before the CDDAs within 72 hours.
- **Assessment:** CDDAs determine if the user is occasional or dependent.
- **Targeted Responses:**
  - Occasional: sanctions
  - Dependent: focus on treatment

Strategic goals

Focus on Traffickers

Shift police resources to target drug traffickers.

Public Health Approach

Prioritize health and treatment for users.

Comprehensive Strategy

Includes prevention, social reintegration, and increased funding for treatment services.

Key Metrics

Death Rate

Unemployment rate

Homicide

Tourists arrivals

Population

Data sets

Metrics	Sources
Drugs use disorder Death Rate	Institute for Health Metrics and Evaluation
Unemployment Rate	OECD Data Explorer
Intentional Homicides Rate	United Nations Office on Drugs and Crime
Tourists Arrivals	OECD Data Explorer
Population	Our World in Data

Difference-in-Differences

DiD was chosen because...

- data available included assessment *before* and *after* the policy intervention (pre/post period);
- it was assumed that Portugal (treatment) and Spain (control), where drugs are not decriminalized, are similar in terms of factors such as geography, culture, and socioeconomic conditions, in order to evaluate the impact of the treatment of drug deaths rate.

Comparing pre and post period, and treatment and control group, we can isolate the treatment effect.

The Difference-in-Difference regression model

$$Outcome\ variable = \beta_0 + \delta_0 Post + \beta_1 Portugal + \delta_1 Post * Portugal + u$$

	Portugal	Spain	Diff
Before invention	$\beta_0 + \beta_1$	β_0	β_1
Post invention	$\beta_0 + \delta_0 + \beta_1 + \delta_1$	$\beta_0 + \delta_0$	$\beta_1 + \delta_1$
Diff	$\delta_0 + \delta_1$	δ_0	δ_1

δ_1: DID in the outcome variable caused by the decriminalization of drugs in Portugal

Deaths by Drug use disorders

All following plots use a logarithmic scale to emphasize the trend in Portugal and provide a clearer graphical representation of the data.

All tables report the unit of measurement corresponding to the observed variable.

The following is a Weighted Difference-in-Differences, applying more weight to years closer to the implementation of the policy.

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[1994, 1996, 1998, 2000] [0.2, 0.4, 0.6, 0.8]
[2002, 2004, 2006, 2008] [0.8, 0.6, 0.4, 0.2]
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|	location	1994	1996	1998	2000	2002	2004	2006	2008	DiD
0	Portugal	133.928992	149.226893	149.645092	144.248819	130.369712	116.591747	105.620878	115.990073	-51.965482
1	Spain	870.713661	924.076815	875.056469	825.385568	803.779895	816.093750	802.694091	821.886993	-110.980593
2	Diff	-736.784668	-774.849923	-725.411377	-681.136749	-673.410183	-699.502003	-697.073213	-705.896920	59.015111

Deaths by Drug use disorders
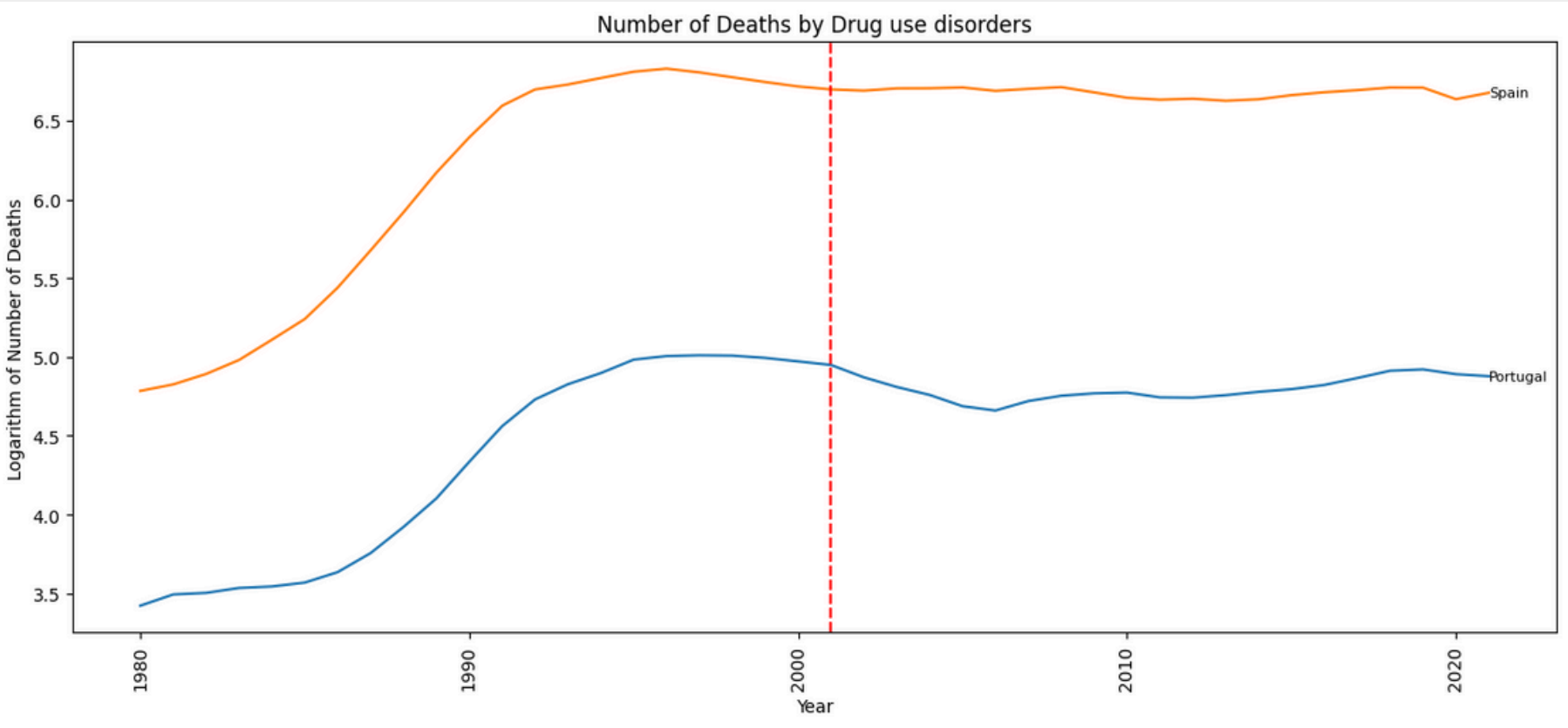
Number of Deaths by Drug use disorders

There is no substantial difference in the death rate by overall drug use disorders.

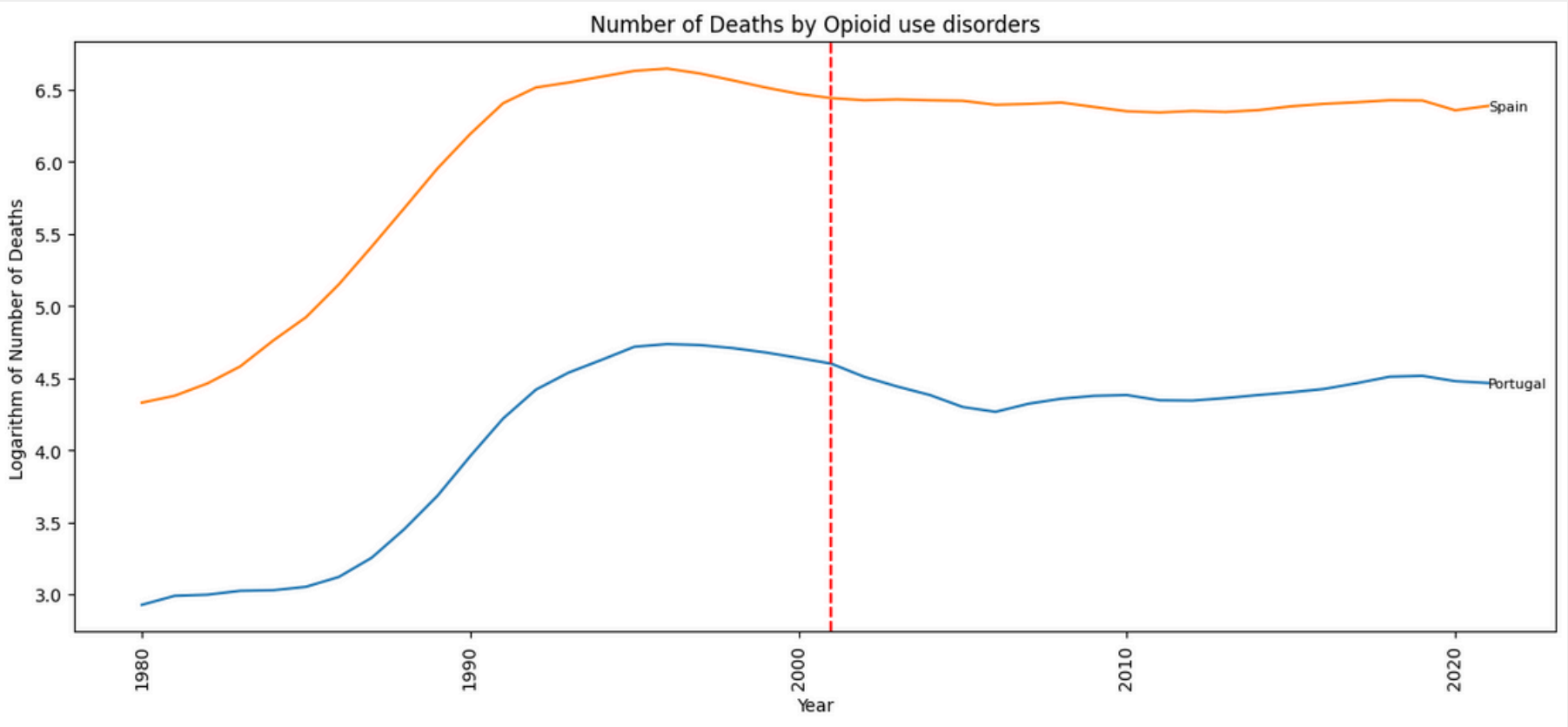|	location	1997	2000	2002	2005	DiD
0	Portugal	149.942628	144.248819	130.369712	108.547285	-55.274450
1	Spain	902.326060	825.385568	803.779895	820.112715	-103.819019
2	Diff	-752.383432	-681.136749	-673.410183	-711.565429	48.544569

Deaths by Cocaine and by Amphetamine

Number of Deaths by Cocaine use disorders
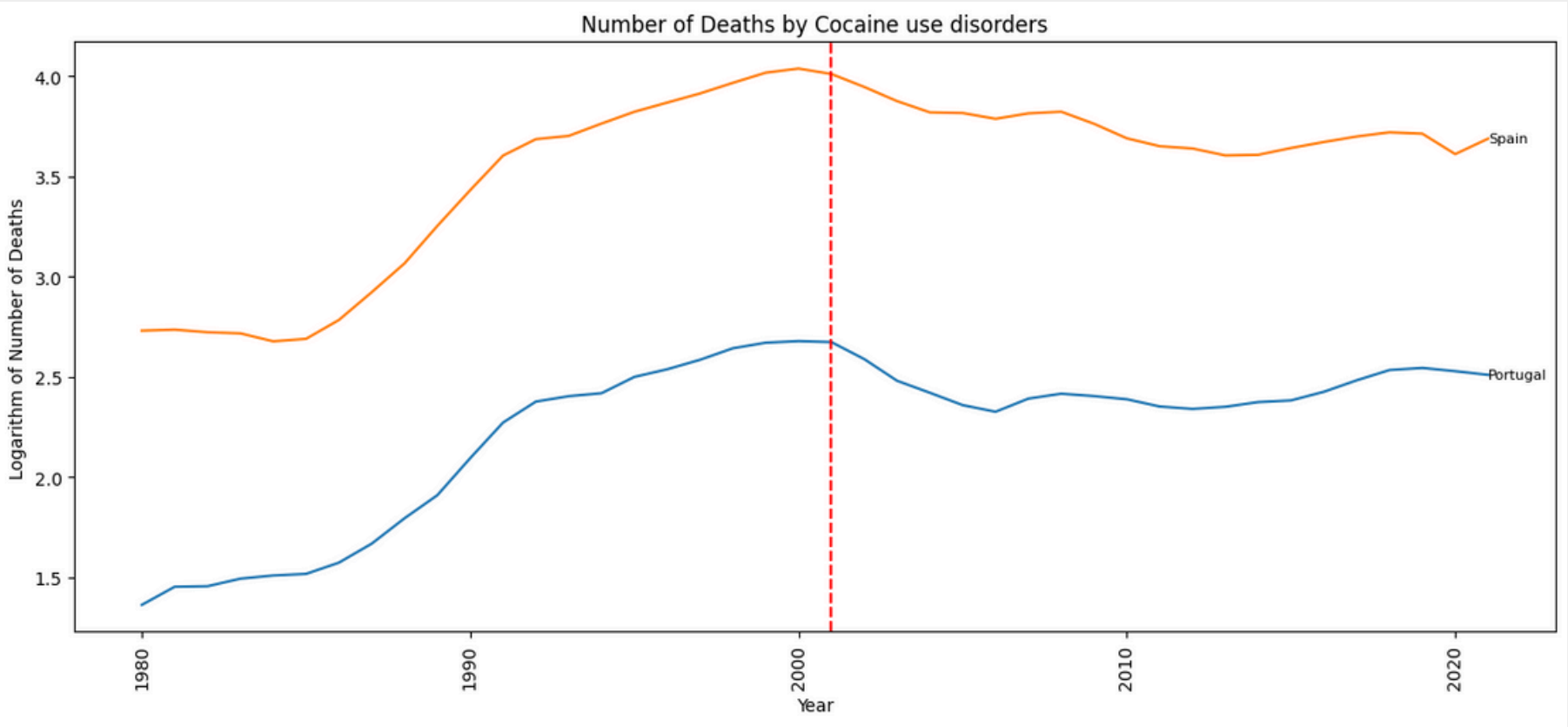
	location	1997	2000	2002	2005	DiD
0	Portugal	13.256282	14.549005	13.302613	10.570829	-3.931846
1	Spain	50.082544	56.708902	51.741243	45.422740	-9.627463
2	Diff	-36.826262	-42.159896	-38.438630	-34.851911	5.695617

Number of Deaths by Amphetamine use disorders
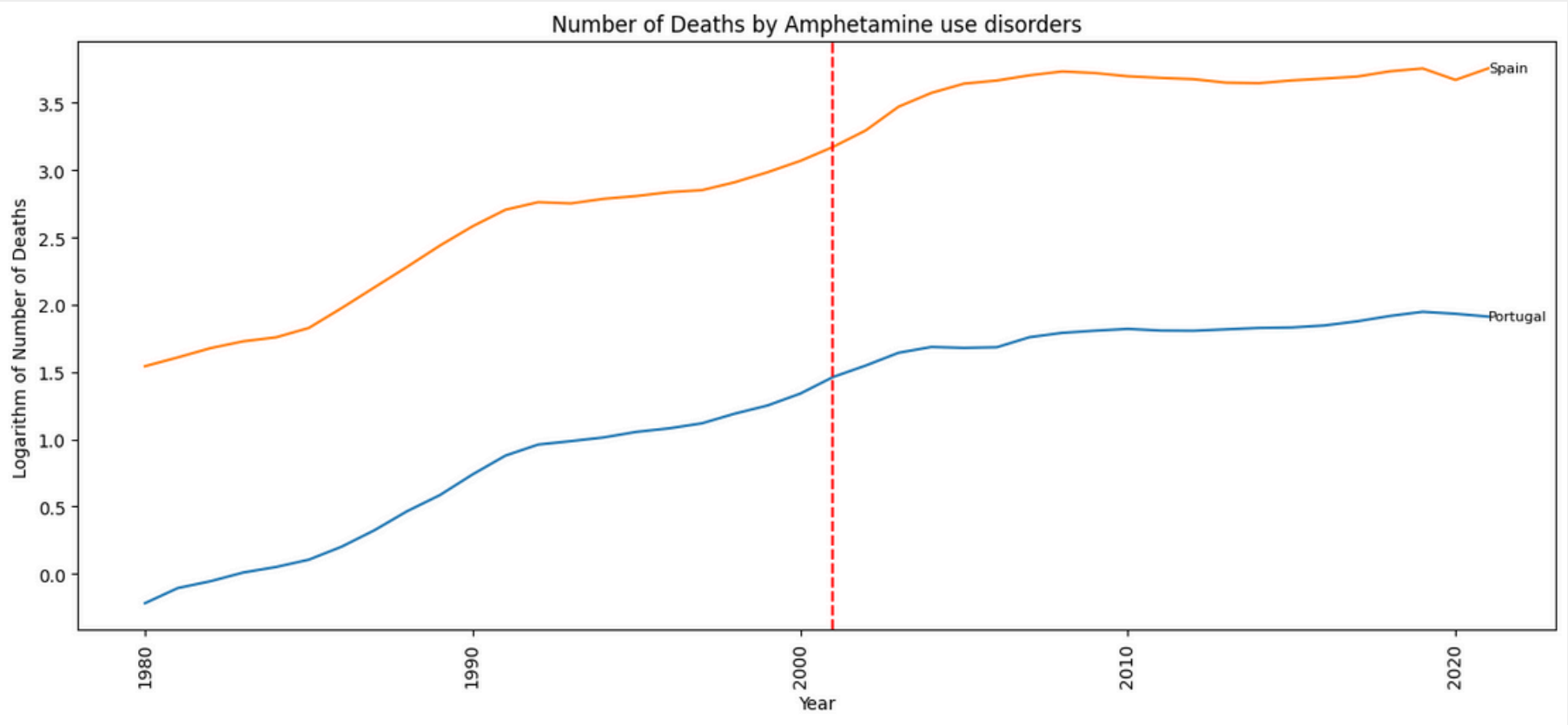
	location	1997	2000	2002	2005	DiD
0	Portugal	3.060132	3.816036	4.701509	5.360578	3.185919
1	Spain	17.310321	21.512287	26.992270	38.205669	26.375331
2	Diff	-14.250189	-17.696250	-22.290761	-32.845091	-23.189413

Deaths by Opiod and by Other drugs

Number of Deaths by Opioid use disorders

	location	1997	2000	2002	2005	DiD
0	Portugal	113.156012	103.491120	90.762773	73.622642	-52.261717
1	Spain	744.769632	646.913068	618.691460	616.420996	-156.570244
2	Diff	-631.613620	-543.421949	-527.928687	-542.798354	104.308527

Number of Deaths by Other drug use disorders
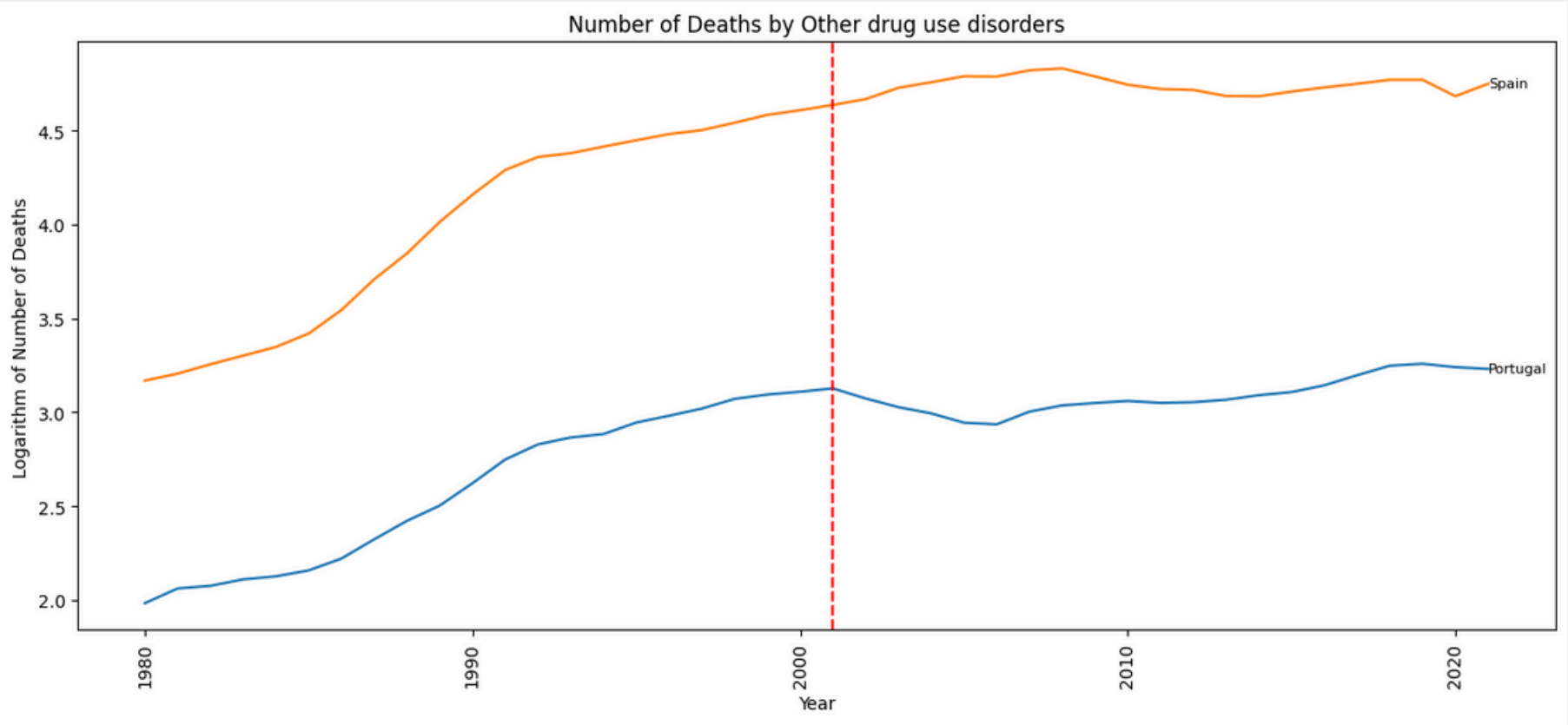
	location	1997	2000	2002	2005	DiD
0	Portugal	20.470202	22.392657	21.602817	18.993236	-2.266806
1	Spain	90.163562	100.251311	106.354921	120.063310	36.003357
2	Diff	-69.693360	-77.858654	-84.752104	-101.070073	-38.270163

Unemployment rate

location	1997	1999	2002	2005	DiD	DiD_%Change
Portugal	0.000064	0.000182	0.000208	0.000315	0.000277	432.14
Spain	0.000171	0.000536	0.000416	0.000352	0.000060	34.97
Diff	-0.000107	-0.000354	-0.000208	-0.000036	0.000217	397.17

After the intervention, in Portugal there is a larger increase of the unemployment rate.
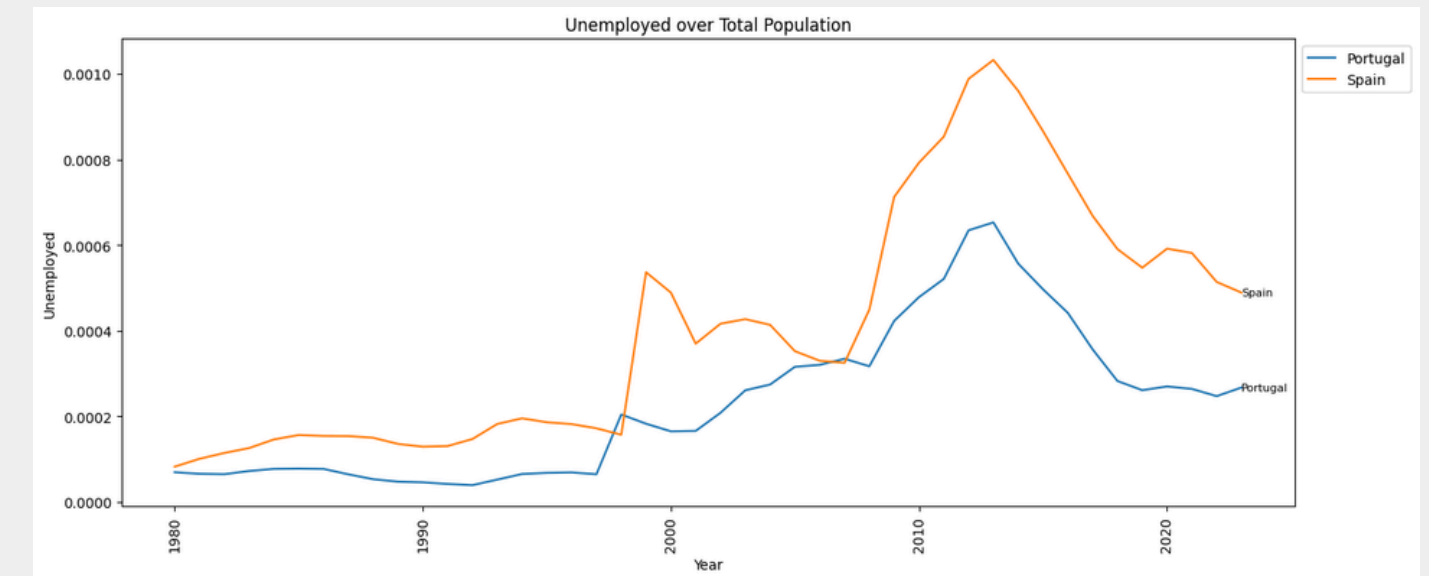
Homicides rate

location	1997	1999	2002	2005	DiD	DiD_%Change
Portugal	1.125309	1.065143	1.140840	1.282866	0.233253	20.73
Spain	1.152313	1.198750	1.359768	1.185752	0.194457	16.88
Diff	-0.027004	-0.133607	-0.218929	0.097114	0.038797	3.85

Homicide rates change similarly in Portugal and Spain.
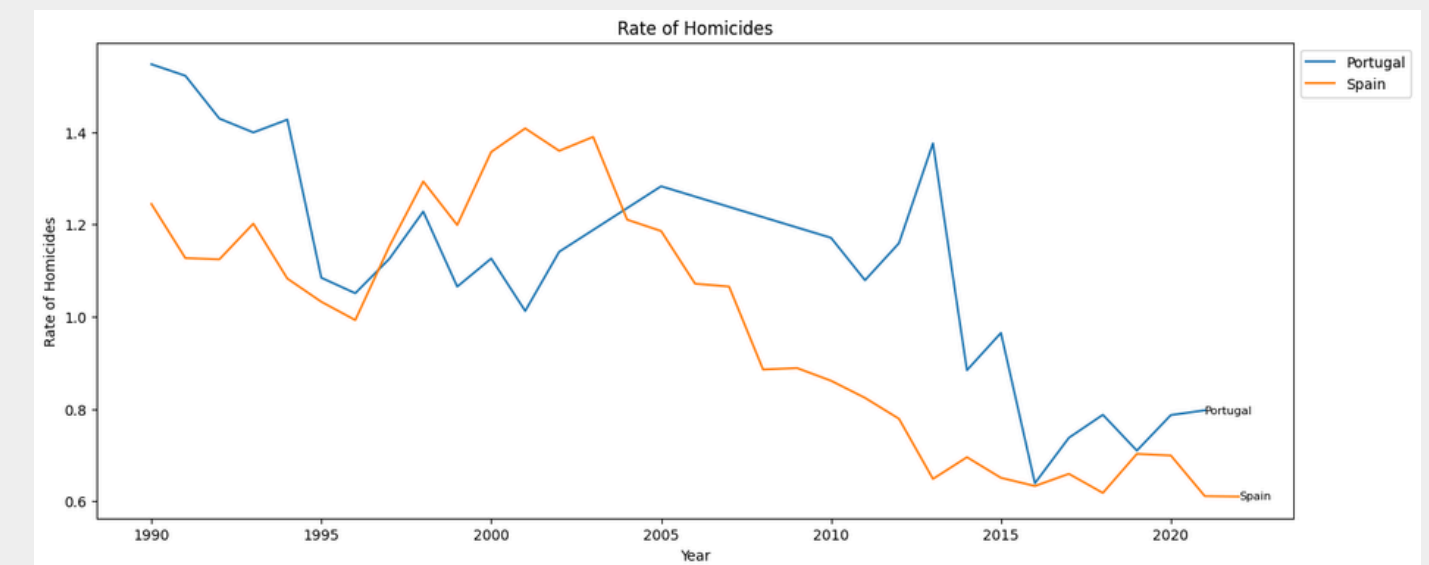
Population

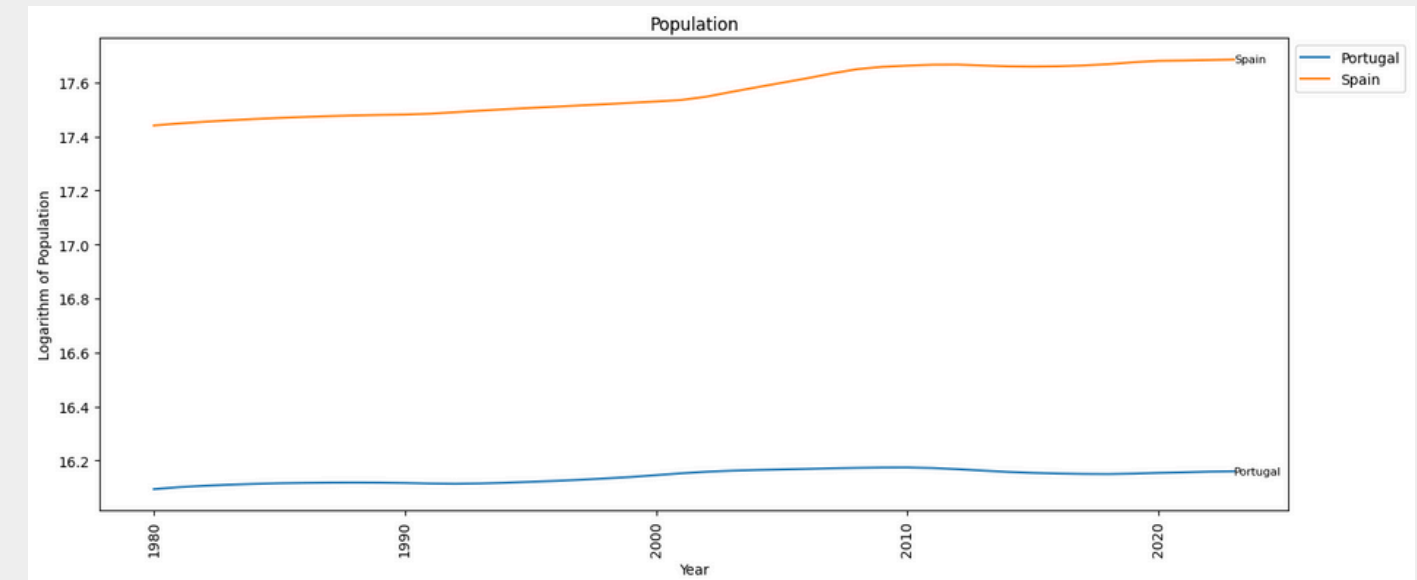| location	1997	1999	2002	2005	DiD	DiD_%Change
Portugal	10110548.0	10214877.0	10413046.0	10502994.0	590615.0	5.84
Spain	40423823.0	40812855.0	41755702.0	43958884.0	4477908.0	11.08
Diff	-30313275.0	-30597978.0	-31342656.0	-33455890.0	-3887293.0	-5.24

Population changes similarly in Portugal and Spain.

Tourism

location	1997	1999	2002	2005	DiD	DiD_%Change
Portugal	10172000	11632000	11644000	10612000	452000	4.443571
Spain	62415000	72040000	79313000	92563000	37421000	59.955139
Diff	-52243000	-60408000	-67669000	-81951000	-36969000	-55.511568

After the intervention in Portugal there is a larger increase of the tourism arrivals in the Spain.
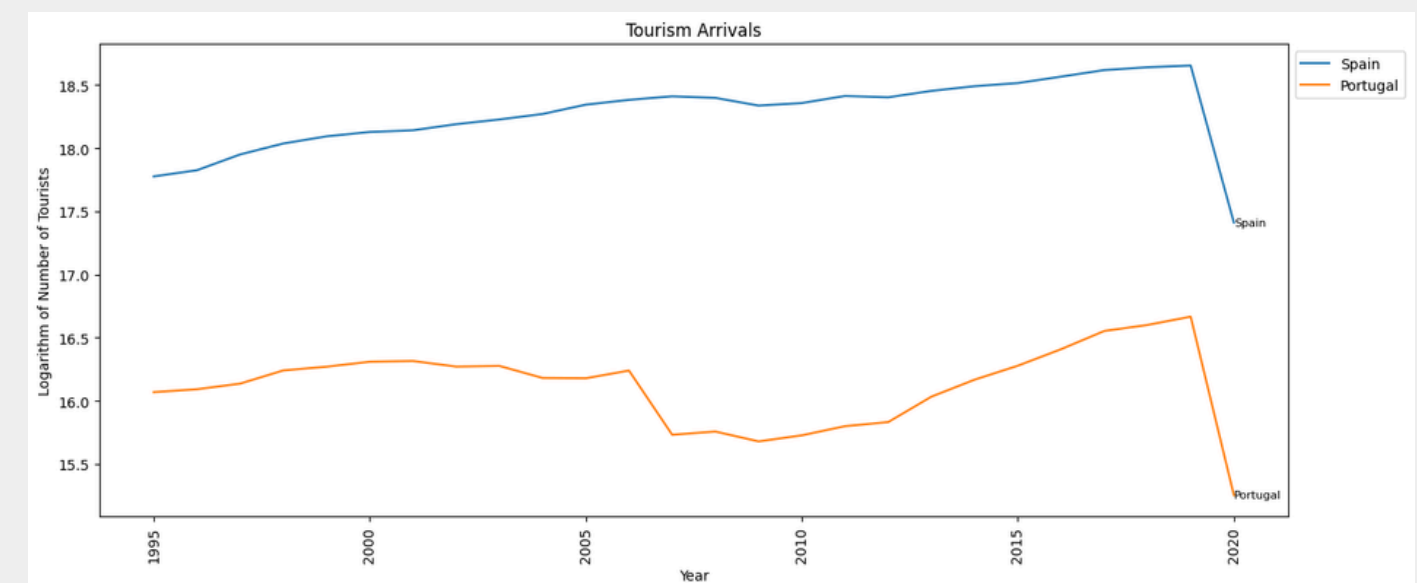
Regression

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                         OLS Regression Results
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Dep. Variable:                   val   R-squared:                      0.762
Model:                           OLS   Adj. R-squared:                 0.753
Method:                Least Squares   F-statistic:                    4329.
Date:               Tue, 01 Oct 2024   Prob (F-statistic):          2.15e-88
Time:                       19:44:06   Log-Likelihood:               -547.77
No. Observations:                 84   AIC:                            1104.
Df Residuals:                     80   BIC:                            1113.
Df Model:                          3
Covariance Type:                 HC3
================================================================================
                                 coef    std err          z      P>|z|      [0.025      0.975]
--------------------------------------------------------------------------------
Intercept                     89.2685     10.970      8.137      0.000      67.768     110.770
location[T.Spain]            464.5824     71.539      6.494      0.000     324.368     604.797
location_post_2001[T.Portugal]  -58.5522     24.781     -2.363      0.018    -107.122      -9.982
location_post_2001[T.Spain]  149.0894     47.420      3.144      0.002      56.147     242.031
post_2001                     90.5372     23.928      3.784      0.000      43.639     137.435
================================================================================
Omnibus:                       8.701   Durbin-Watson:                  1.210
Prob(Omnibus):                 0.013   Jarque-Bera (JB):              12.014
Skew:                         -0.429   Prob(JB):                     0.00246
Kurtosis:                      4.642   Cond. No.                     1.87e+16
================================================================================

Notes:
[1] Standard Errors are heteroscedasticity robust (HC3)
[2] The smallest eigenvalue is 4.14e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
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Time period:
1980 - 2021

Dependent variable:
Deaths by Drug use Disorder

Key findings

Difference-in-Differences
- There is no substantial difference in the death rate by overall drug use disorder.
- After the intervention unemployment rate increased more in Portugal.
- No differences for Homicide rate and Population.

Regression
- After 2001 there was an increase of the death rate by drug use disorder in Spain, while there was a decrease of the death rate in Portugal.

Limitations

Difficulties to find suitable data sets

Different country size makes it hard to compare

Chosen timespan has a great influence on the analysis outcome

Unobserved heterogeneity

Thank you for the attention.

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