THEFT AS OCCUPATION: ASSESSING THE RELATIONSHIP OF CRIME WITH UNEMPLOYMENT RATES AND BENEFIT EXPENDITURE IN SPAIN

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THEFT AS OCCUPATION: ASSESSING THE RELATIONSHIP OF CRIME WITH UNEMPLOYMENT RATES AND BENEFIT EXPENDITURE IN SPAIN FROM

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Economics

Abstract

This paper will examine the relationship that unemployment benefit expenditure and unemployment rates have on crime rates. The study will focus on Spain, but will include analysis of five other European Union member states in the years 1993 to 2012. In times of unemployment and poor economic health, more individuals choose to perform criminal acts to make ends meet. We will use data from the European Commission and OECD databanks to create a reduced-form OLS model that is controlled for time. We found that this reduced-form is insufficient for analyzing the complex behavioral economics that go into the financial motivations for committing a crime. Our research did present opportunities and guidelines for further research to be done focusing on Spain's metropolitan districts.

KEYWORDS: (Unemployment, Crime, Benefits, Welfare, Spain, European Union)
JEL CODES: (J65, J200, Z130, F150)

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ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED
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Signature

TABLE OF CONTENTS

Introduction

Unemployment heavily influences an individual's satisfaction levels. It undermines financial comfort, the ability to support a family, and the image of the self. In this financial state, some turn to crime as an alternative method for gaining income. The relationship between crime and unemployment has been studied since the end of the Great Depression in the United States, with greater seriousness after World War II. While levels of violent crime or crimes against persons seem unaffected, petty crimes and crimes against property have been shown to increase in communities with growing levels of unemployment. This has shown to be especially evident in many Southern-European cities, most notably in the metropolitan districts of Spain. This combined with the unique makeup of Spain's economy that integrates characteristics of different welfare regimes makes Spain a fascinating platform on which to study economic behavior. Individuals resorting to crime see it as an *alternative* to the lifestyle changes and insecurities that result from a loss of steady income. Crime is a reaction to the realities of unemployment.

Governments must both protect their citizens and keep them from the disturbances of fearing crime. There are always times when the public fear towards crime is augmented. Fittingly, one of these times follows newly increased levels of unemployment. The fear of crime comes from feelings of insecurity and the perception of being helpless against the society in which you live. It is a transition to seeing your society as a threat, which is harmful to a nation working towards optimal function. Fear is felt on an individual level, but is augmented and multiplied by its perception in mass media. It consists mainly of public intolerance of certain social groups, and responses to specific regional crimes or events. Both local and Federal governments react to increases

in unemployment by expanding law enforcement measures, as well as augmenting punishments for those found guilty.

Many nations have introduced measures to lessen the blow resulting from an unemployment increase, the most popular of which being unemployment benefits. These systems became popular after WWII, when many nations began moving towards becoming welfare states. Funded predominantly by income taxes, social security benefits offer income to individuals who are out of and currently seeking work. Both of these characteristics are necessary in being classified as *unemployed.* There is an emphasis on the act of seeking and being able to work, which requires a *job search*. This introduces unemployment benefits to the job search paradigm.

This paradigm is a state of mind where despite not having work, the benefits you are receiving make unemployment increasingly attractive. This predicament throws off the careful balance that policymakers consider when designing benefits packages. These packages help people enter back into the role of a productive member of the economy. The abuse of these government welfare plans has a cost to society by causing adjustments in tax structure. Another option, crime, also has costs to society. Many economists have examined the relationships between crime and benefits individually against unemployment. Few economists have combined both to find an optimal balance: one that offers support to deter against crime, but not enough to tempt one to remain unemployed.

When accounting for variations in average tax rates compared to the difference between pre-unemployment wages and unemployment benefits, certain people may be discouraged to remain employed. This is why studies show that in Spain, reduction in

social security compensations by *employers* decrease unemployment rates. When employers pay less for benefits, individuals pay more. Less expenditure by employers eliminates the decreases to GDP, but more expenditure by individuals increases the public deficit. The most effective solution in Spain to help with unemployment would be to offer incentives with sanctions. The sanctions would deter individuals from exploiting government welfare plans. It is of the utmost importance for policymakers to *not* implement benefits that make remaining unemployed seem more tempting. It is difficult to monitor actions of the unemployed, and the best indicator of their productivity can be seen in the time spent unemployed. Unemployment benefits lead to greater satisfaction with the job acquired as well as cumulative income post-unemployment. Unemployment benefits prolong the time that individuals spend unemployed.

Social protection at the state level lowers public fear by lessening individual and social stresses that may result in criminal offenses. There are both direct and indirect costs of crime to be considered. Increased personnel on the streets to catch perpetrators is a costly installment. It does, however, mitigate fear and decrease the cost spent to remedy damages from property and petty crimes. There is also a cost to implement and maintain welfare and benefit systems. Tax dollars go to both of these branches, crime control and social security, with an optimal balance existing for each nation.

Spain's Post-Franco Era began in 1975 with a long period of sluggish growth, with the economy struggling to remedy the overwhelming inflation that continued well into the 1980's. In the second half of the '80s, the economy took a sharp turn for the better, with the new Socialist government strongly expanding output and employment

while slowing down inflation. This shift from right-wing dictatorship to constitutional monarchy supported Spain's entrance into the European Union in 1986. The EU at this time was functioning primarily as a trade union, a role that helped Spain greatly in letting economic growth and European integration grow parallel to one another. Despite many advancements in infrastructure and social services, Spain's economic maturity was still behind compared to most of Western Europe.

The police function in Spain has fluctuated greatly according to the country's political history. There has been little separation between Spain's military and the police force in the past. Francisco Franco's Fascist regime advanced this connection by assigning different roles to each of the three main law enforcement organizations, but all were acting under direct order of Franco himself. After Franco, there was a need to bring law enforcement into accord with the new era of constitutional monarchy. The police abandoned their military ties and all organizations were put under civilian leadership. There was a shift from the public viewing the law as a force of surveillance and oppression to one that defends individual liberties. This trusting and non-oppressive impression is one that the majority of Spanish citizens hold today.

This social dynamic contributed to the influence that culture had on the development of Spanish economic function. This function and structure then contributed to the welfare system. The welfare system of Spain has individuals relying heavily on family support as opposed to the State or labor market, while still having the government provide welfare benefit options. This makes Spain a unique hybrid of the Southern-European and liberal-welfare regimes. Certain choices are generous enough to be

comparable to states such as the United Kingdom whose cultures hardly stress family support. Still, Spain continues to suffer from infamous unemployment rates and be notorious for its petty crime networks, particularly in the metropolitan area of Barcelona.

In this study, we will view the correlation between benefit expenditure and unemployment with national crime rates. If it is proven that crime responds to increased benefit expenditure in Spain, new structures can be implemented. From here, sanctions can be placed on the benefit system to reach the optimal balance in the Spanish regime. A reduced-form OLS model will be used, logging values to control for proportional differences resulting from varied population sizes. We will look at unemployment rates in the year following the exhaustion of unemployment benefits. International labor literature as well as raw data from the European Commission Databank and the Organization for Economic Cooperation and Development (OECD) will be used to analyze the relationships.

While drawing data from six countries in different welfare regimes to draw theoretical conclusions, specific policy recommendations will remain exclusive to Spain. The remainder of this paper will contain a literature review, overview of the data, and analysis of data collected before moving on to results, policy implications, recommendations, and a conclusion.

Literature Review

Unemployment is one of the most telling indicators of the health of an economy. Through many macroeconomic principles, we know of a connection between unemployment against inflation and recession. From there we see its correlations with exchange rates and GDP growth. It is a revealing signifier of the overall market, mirroring slowdowns in both consumption and production levels in all reaches of the income distribution. What sets unemployment apart from other indicators is its tendency to influence both our financial and psychological health. To identify as employed validates your standing in the local and international community, as well as augmenting your satisfaction levels. In reaction to shocks in the economy, unemployment levels have shown to increase as economic health decreases. Unemployment increases hit households by taking away income, which is the basis of most livelihood. A shock to income may cause some to resort to alternative methods to maintain a reasonable standard of living.

For decades, economists have explored the correlation between national unemployment levels and crime rates. The first wave of credited research followed World War II, when labor forces returned home to scattered job markets. Many could not quickly settle back into their pre-war comforts, and fell into the ranks of individual and organized crime networks to make ends meet. The decision to resort to crime follows a comparison of the expected costs and benefits of legal and illegal activities (Fougère, Pouget, Kramarz). Crime proved to be a reaction to stimuli as well as the result of a predisposed rebellion complex. Each stimuli include expected punishments as well as returns and costs. Strain theories emerged in the 1960's to argue crime as a result of the inability to achieve goals through legitimate means (Merton, 1957).

The Becker Model was introduced in 1968, placing unemployment as a tool to view how potential criminals fare in the legitimate job market. Becker argues that the optimal amount of enforcement depends on the financial repercussions of the crime committed, as well as the cost of obtaining offenders. This includes costs of arrest, processing, trial, and incarceration. By analyzing these costs, Becker discovered ways to minimize the social cost of crime to the public, and proclaimed optimal policies for combatting illegal activities to be a key ingredient in allocating a nation's budget (Becker). The same study introduced the importance of clearly distinguishing the type of crime committed as a variable when regressing to find correlations.

The most important line drawn was that between property and personal crimes. Economists continue to agree unanimously that the elasticity of crime in relation to unemployment is significant only in reference to petty or property crimes. Those who commit crimes as a response to stimuli rather than personal nature are referred to as rational offenders. Rational offenders primarily commit crimes against the property as opposed to crimes against the person. Crimes against the person are more likely to be influenced by personal vendettas or skewed morals, rather than reactions to economic shocks, and are considered highly individualistic (Andresen).

To control the population of rational offenders, many nations increase punishment and enforcement of the law during times of economic turmoil (Zenakis & Cheliotis). These actions are designed to both anticipate the potential for new criminal tendencies, as well as to reassure the public that measures towards their safety are being taken. It is believed that the

> Increased use of imprisonment is not a direct response to any rise in crime, but is an ideologically motivated response to the perceived level of crime posed by the swelling population. This position does not deny the possibility of increasing crime accompanying unemployment, but states instead that unemployment levels have an effect on the rate and severity of imprisonment over and above the changes in the volume and pattern of crime. (Box & Hale, 1982)

In response to this, theorists Cantor & Land published groundbreaking research in 1985 correcting and adding to previous conclusions about the relationship between unemployment and crime. They found that all prior research emphasized the distinction between assuming that unemployment *causes* the individuals to commit a crime. They concluded that the true argument should concern the influence that the realities of unemployment have on the realization that committing a crime is more opportunistic than settling into a new and less comfortable life. Cantor & Land's findings set a new standard to how research approaches the relationship between crime and unemployment.

There is a range of motivation to commit a crime, and all individuals in a given population fall somewhere on this line. As unemployment shifts, the density of the distribution of the population willing to commit an offense moves upward on this trend line. Then, the mean and median shift accordingly (Cantor & Land). By the nature of this distribution and how it is affected by shocks, we deduce that the result is an increase in crime rates. Applied, this increase is a result of two distinct mechanisms that are activated by unemployment increases: *criminal opportunity* and *criminal motivation*. A complete theoretical prediction of crime rates must involve both (Hohstetler & Shover).

The prime motivator for involvement in crime has long been triggered by lack of a better option in times of sparse opportunities that accompany economic slumps. One strategy for lessening the negative ramifications of joblessness lies in national unemployment benefits and welfare systems. A state-level program for social protection also serves to cushion the population's fear of an unemployed life. It does this by lessening individual economic fears that could otherwise materialize into the performance of a crime. When used appropriately, this could limit the effects of *criminal motivation*. Many would prefer to rely on these systems rather than commit crimes. The cost of said programs should consider the difference between the investment towards law enforcement systems and the social cost of crimes committed, both of which are sourced from tax dollars. Unfortunately, it is not as simple as trading out the cost of crimes with the payment towards benefits. There exist many repercussions to offering unemployment benefits, many of which have been researched in recent decades as complex welfare systems no longer remain exclusive to highly developed countries.

The influx of welfare states and systems gave way to high levels of system customization for each nation. Many have attempted to compartmentalize the different levels of support presented in the systems, with categories differing between studies in economics, sociology and criminology, as well as over time. Konstantinos Tatsiramos's offers a current and economic table of classifications that will be used in this paper to differentiate between welfare programs. All modern systems fall under the title of one of these four regimes: the *universal*, the *conservative*, the *liberal welfare, and* the *Southern-European state*. *Universal welfare* systems such as those in Scandinavian nations are defined by flexible labor markets and generous policies sourced from high taxes on labor

income. *Conservative welfare* states include Germany, Austria, France, Belgium, and the Netherlands. Similar to the Scandinavian universal welfare systems in terms of generosity, these states operate depending on previous income earnings, with "means-tested social transfers [acting] as a residual safety net" (Tatsiramos, 2009). Almost all Anglo-Saxon countries function through *liberal welfare*. These systems are characterized by flexible labor markets and means-tested social transfers. Investment rates remain lower than those in universal and conservative regimes. *Southern-European* nations such as Spain, Italy, Greece, and Portugal traditionally weigh heavier reliance on the family rather than government social programs. Culturally, children live at home for much longer and have a higher tendency to remain near their extended families when finally moving out. Mandatory social security contributions in these countries are much lower relative to the previous groupings.

Many national systems have entertained the idea of unemployment benefits with sanctions and restrictions. Issues arise when individuals use these benefits as an unfair crutch, taking advantage of welfare to enjoy a prolonged streak of unemployment. In the long run, this harms both families and nations as a whole. Benefits have shown to influence the duration of unemployment as well as the intensity of the job search process. Since the beginning of the Great Recession, the *job search paradigm* has come under heavy examination, proving to be the best indicator for individual behavior while unemployed (Tatsiramos). The theory predicts that an increase in unemployment benefits increases the duration of unemployment. Those unemployed experience a lower opportunity cost in searching for a job until they near the point of benefit exhaustion (Lippman & McCall, Tatsiramos). Benefit sanctions are effective in counteracting the

paradigm, and influence the duration of unemployment through two main channels (Lalive, Zweimuller, van Ours). The first is *expost*, where increased search intensity is shown by the sanctioned individual as a result of a decreased attraction towards unemployment. The second is *exante*, where the risk of receiving a future sanction on benefits increases search behavior of the unemployed worker.

The common thread is that in times of economic hardship, governments take the initiative to enforce various punishments onto their citizens. These punishments are designed to counteract the increased attraction towards crime, both by making crime more socially costly, and by making employment more appealing. The decision of where to assign certain levels of punishment is the result of the above-mentioned economic and social factors, as well as cultural factors that help define individualistic operations of the citizens. Spain is a nation with a *Southern-European* welfare regime that offers *conservative* generosities, houses notorious petty crime systems, and features a developed economy shaped by a rocky political streak. It is the thriving influence of Spain's culture and its combining components of different regimes that prompted this study to focus its data research on the Kingdom of Spain.

Spain's reliance on the family is effective in lessening the difference between an unemployed adult and employed adult. In Spain, GDP per capita holds a correlation with crime rates that is in some years stronger than unemployment (Buonanno & Montolio). This is particularly applicable to those individuals under 35 years old who have entered an inhospitable labor market (Marsh & Alvaro). Many of those who choose crime in the face of unemployment are those without these strong family ties. Others are young men

and women who have become involved in petty theft networks in major cities, notably Barcelona.

The benefit entitlement system in Spain generates disincentives for some to remain employed. Fifty percent of those without these entitlements have reason to go from being employed to unemployed, since their variation in average tax rates will increase while unemployed. This shows that the tax-benefit system is flawed, and should perhaps implement stronger barriers (Labeaga, Molina, & Navarro).

Age structure has proven significant in affecting crime rates, with young males aged 15-19 playing the strongest role in the increasing numbers (Buonanno & Montolio). There has been growing concern in Spanish society regarding the increased delinquency in youths. The topic has also caught the attention of international media. The booming tourism industry is providing these small-time criminals with a flow of targets that has no end in sight.

Where incentives to remain unemployed and opportunities for illegal income while unemployed are strong and plentiful, Spain requires a reform to the balance of investment between social security benefits and law enforcement reactions to crime. To have the youth allocate their potential into positions that benefit the Spanish economy instead of victimizing its tourists would help Spain strengthen its economy as it moves further into the 21st century.

Discussion and Descriptive Analysis

The first step in creating this model was choosing the proper variables that would influence the dependent variable of crime rates. From this came two major categories of data: unemployment data and benefit expenditure data. Unemployment data was gathered from the OECD DataBank. Values for crime and benefit expenditure were gathered from the European Commission Eurostat Database.

In the following data set, eight variables were used. The first is Country. The countries we will study are Spain, Germany, Italy, Ireland, Hungary, and Sweden. First, this group contains one country from each of the four previously mentioned welfare categories. These four countries are Sweden (universal), Germany (conservative), Ireland (liberal)[1], and Spain (Southern-European). Italy was included to give a perspective of Southern-European welfare systems that is different from the focus of the study, Spain. Hungary was added to represent the nations of Eastern Europe that are an important part of the European Union.

The Year variable represents the passing of time in the data, beginning in 1993 and going up to 2012. This range provided the strongest available data in unemployment, benefits, and *reliable* crime reports. As the literature argued, few nations responsibly reported accurate crime rates before the year 1993. The Crime variable is the amount of non-violent crimes reported by the police in the country that year. Violent crimes and crimes against the person were excluded as a result of all relevant literature stating that

[11] Initially, the United Kingdom was chosen to represent the liberal welfare systems. Through several levels of research it was found that different databases include Northern Ireland and Scotland in values for the UK while others do not. This would skew the correlation coefficients, making the results unreliable. It was thus concluded that Ireland standing alone is the most reliable member country of the European Union under the liberal welfare system.

unemployment does not influence this nature of crime. The value we have is filtered to show the sum of robberies, domestic burglaries, and motor vehicle thefts. This excludes homicides, violent crimes, and trafficking. The Benefits variable tracks the government expenditure on benefits that are relevant to unemployment. It compiles full unemployment benefits (means and non-means tested), and partial unemployment (means and non-means tested). The scale used is Euro per inhabitant at constant 2005 prices. I expect to see that as expenditure on benefits increases, crime rates will decrease.

The unemployment variable was gathered for each of the six nations, and was then lagged either two or three years. The maximum amount of time in which to receive unemployment benefits in Spain is two years. We will thus look at Spain's values lagged three years. We will lag the values for the remaining nations by two years. These years correspond specifically with each nation, and show the unemployment in the year *following* the exhaustion of unemployment benefits that the citizens would receive. This would give the effect of unemployment time to influence the individual's decision-making. In the year after benefit exhaustion, one would be more likely to commit a crime and would likely have not found employment yet. I expect to see a positive correlation coefficient between unemployment and crime. I expect that when unemployment increases, crime rates will also increase.

The chosen variables will be a part of a reduced form regression. This will not be a complete model, and the variables were chosen as suggested by the literature. Our chosen structure will introduce worries about autocorrelation that will be addressed in the specification testing section.

All variables will be regressed under a natural log in order to view the final coefficient as an elasticity. This is also preferable since our crime data is not normally distributed. In the following regression, crime will be treated as the dependent variable. Benefit expenditure and unemployment will serve as independent variables. We will see how these variables influence the likelihood of individuals to choose a life of crime.[2]

[2] After viewing first round of data, it was noticed that there was an omitted variable in the model. The variable of Immigration was then added to the regression. Those individuals who have immigrated into one of our chosen countries will appear in unemployment rates and crime rates, but not be offered benefits. Their decision to become involved in crime therefore cannot be influenced by these welfare programs. The immigration values are collected as the number of individuals who have entered the country in a given year, and were taken from the OECD International Migration Database. They include inflows of foreign population, foreign workers, and foreign seasonal workers. Unfortunately, after running these numbers, it was still evident that the northern countries regression outcomes were not responding as predicted. Immigration did not help these countries yield more statistically significant values, and was harming the significance coming from the other countries. Therefore, the immigration variable was not included in the final regression.

Data Summaries

Spain:

```
. summarize  lnCrime lnBenefits lnUELag3 Year if Country == "Spain"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	19	12.55247	.2766009	11.51061	12.80616
lnBenefits	20	5.673794	.3276924	5.224725	6.168061
lnUELag3	18	7.90496	.302248	7.513752	8.442409
Year	20	2002.5	5.91608	1993	2012

Germany:

```
. summarize  lnCrime lnBenefits lnUELag2 Year if Country == "Germany"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	20	12.68885	.2616553	12.41809	13.13
lnBenefits	20	5.78328	.1267482	5.529072	6.008224
lnUELag2	19	8.13254	.1482013	7.81764	8.418265
Year	20	2002.5	5.91608	1993	2012

Ireland:

```
. summarize  lnCrime lnBenefits lnUELag2 Year if Country == "Ireland"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	20	9.476695	.1452052	9.035034	9.689056
lnBenefits	18	6.010449	.4558668	5.453053	6.824417
lnUELag2	19	4.892778	.4899219	4.189655	5.758902
Year	20	2002.5	5.91608	1993	2012

Italy:

```
. summarize  lnCrime lnBenefits lnUELag2 Year if Country == "Italy"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	20	13.14497	.1361973	12.94048	13.35221
lnBenefits	20	4.65397	.2822414	4.315887	5.247129
lnUELag2	19	7.68619	.1937827	7.304511	7.935861
Year	20	2002.5	5.91608	1993	2012

Hungary:

```
. summarize  lnCrime lnBenefits lnUELag2 Year if Country == "Hungary"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	20	10.54927	.2176237	10.27622	10.94903
lnBenefits	14	3.154992	.2153011	2.865623	3.56133
lnUELag2	19	5.807583	.2542995	5.455808	6.251769
Year	20	2002.5	5.91608	1993	2012

Sweden:

```
. summarize  lnCrime lnBenefits lnUELag2 Year if Country == "Sweden"
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lnCrime	20	11.35301	.1790433	10.99348	11.55047
lnBenefits	20	5.809477	.4601411	4.97763	6.380105
lnUELag2	17	5.807247	.230964	5.420978	6.098963
Year	20	2002.5	5.91608	1993	2012

The data used for this summary was collected through the online OECD DataBank and the online European Commission Databank over the fall of 2014. All observation values are low, and correspond with how many years of reliable data were found for each country. Hungary holds the lowest observations with 14, and this is because Hungary missed years in the late 1990's when reporting their official crime and unemployment rates. Despite its low amount of observations, Hungary was kept in the model to represent the Eastern and Central European system characteristics.

Regression Models

I ran this regression with Crime as the dependent variable. Benefit expenditure, the number of unemployed individuals, and Year served as the independent variables. The regressions were performed with a Bysort by Country. This allows us to look at the rates of each country individually without having them affect each other.

Root Model:

$Y = A + \beta_1 UE + \beta_2 \text{ Benefits} + \beta_3 \text{ Year} + e$

Spain:

Y= A + (-0.2697601) UELag3 + (0.09495) Benefits + (-0.0041263) Year + *e*

Germany:

Y= A + (-0.1775164) UELag2 + (-0.3319539) Benefits + (-0.0424385) Year + *e*

Italy:

Y= A + (0.0771374) UELag2 + (0.2023813) Benefits + (-0.0161968) Year + *e*

Ireland:

Y= A + (0.0692111) UELag2 + (-0.2659509) Benefits + (-0.0125354) Year + *e*

Hungary:

Y= A + (-0.1895293) UELag2 + (0.6433563) Benefits + (-0.0522755) Year + *e*

Sweden:

Y= A + (0.041247) UELag2 + (-0.2751396) Benefits + (-0.0276375) Year + *e*

Estimation Methods

I chose to use an OLS model because I have panel data with a time series for each country, and because it is the best linear unbiased estimator. This is only the case when none of the classical assumptions for OLS are violated, which will be checked through specification testing.

Specification Testing

I ran a series of different specification tests to make sure that my model was not violating any classical assumptions. All tests were done on each country separately. [3] Tests for normality were not seen as necessary since all data was treated as a logarithm that is normally distributed. Since all of the values are positive, the creation of natural log variables was not an issue. Number of crimes committed, number of individuals unemployed, and amount of money spent in any given year will always be greater than zero.

Since I worked with panel data, I found testing for autocorrelation essential. To do so, I performed a Durbin-Watson d-test on each country separately.[4] Germany and Italy failed the test, showing us that there is autocorrelation in the data. The remaining countries' results fell into the uncertainty zone. To err on the side of caution, I ran all regressions again using Year as an independent variable.

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[3] Histograms were generated to observe the normality in the distribution of crimes reported. The values were so small having only been reported since 1993 so the histograms were proven inconclusive and were not included in the final results or appendix.

[4] Appendix A

Next, I looked for issues in multicollinearity. To do so, I ran both a multicollinearity test[5] as well as a Variance Inflation Factor (vif) test.[6] I found both necessary because the former will show us the collinearity between all the variables explicitly, while the latter will tell us whether or not there is a problem at all. I found that there is multicollinearity between my variables. In the correlation table, the highest values came from the Year variable, showing that there is heavy correlation between time and other variables. The vif tests show that the multicollinearity in Spain and Germany is not high enough to cause serious issues with the data. In Spain, the correlation between Crime and Benefits is the only cause for alarm. Germany has no relationships stronger than 50% between the variables, showing no reason to be concerned. Both Italy and Hungary are borderline at-risk, with collinearities with the Crime variable. Ireland and Sweden suffer greatly from multicollinearity across the board. These results show that the model is flawed, and the multicollinearity may lead to inefficiency in the estimates.

[5] Appendix B
[6] Appendix C

Regression Results

SPAIN

```
. regress  lnCrime lnBenefits lnUELag3 Year if Country == "Spain"
```

Source	SS	df	MS		
Model	.147168244	3	.049056081	Number of obs	18
				F(3, 14)	8.16
Residual	.084198514	14	.00601418	Prob > F	0.0022
				R-squared	0.6361
				Adj R-squared	0.5581
Total	.231366757	17	.013609809	Root MSE	.07755

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.2697601	.0818287	-3.30	0.005	-.4452652	-.0942549
lnUELag3	.09495	.0783991	1.21	0.246	-.0731994	.2630994
Year	-.0041263	.0046014	-0.90	0.385	-.0139953	.0057427
_cons	21.64534	9.268853	2.34	0.035	1.765632	41.52506

GERMANY

```
-> Country = Germany
```

Source	SS	df	MS		
Model	1.01015799	3	.336719329	Number of obs	19
				F(3, 15)	58.88
Residual	.085786866	15	.005719124	Prob > F	0.0000
				R-squared	0.9217
				Adj R-squared	0.9061
Total	1.09594485	18	.060885825	Root MSE	.07562

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.1775164	.1614803	-1.10	0.289	-.5217037	.1666708
lnUELag2	-.3319539	.1386632	-2.39	0.030	-.6275074	-.0364003
Year	-.0424385	.0032577	-13.03	0.000	-.0493822	-.0354948
_cons	101.3963	6.785086	14.94	0.000	86.93422	115.8584

ITALY

```
-> Country = Italy
```

Source	SS	df	MS		
Model	.226291314	3	.075430438	Number of obs	19
				F(3, 15)	10.80
Residual	.104806963	15	.006987131	Prob > F	0.0005
				R-squared	0.6835
				Adj R-squared	0.6201
Total	.331098277	18	.018394349	Root MSE	.08359

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.0771374	.0891104	0.87	0.400	-.1127969	.2670717
lnUELag2	.2023813	.1584543	1.28	0.221	-.1353561	.5401187
Year	-.0161968	.0065065	-2.49	0.025	-.0300652	-.0023284
_cons	43.66545	13.71653	3.18	0.006	14.42935	72.90155

IRELAND

```
-> Country = Ireland
```

Source	SS	df	MS	Number of obs =	18
				F(3, 14) =	12.95
Model	.289377209	3	.09645907	Prob > F =	0.0003
Residual	.104245859	14	.007446133	R-squared =	0.7352
				Adj R-squared =	0.6784
Total	.393623068	17	.023154298	Root MSE =	.08629

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.0692111	.1234709	0.56	0.584	-.1956077	.3340299
lnUELag2	-.2659509	.096938	-2.74	0.016	-.4738622	-.0580395
Year	-.0125354	.0058284	-2.15	0.049	-.025036	-.0000348
_cons	35.47337	11.41556	3.11	0.008	10.98943	59.95731

HUNGARY

```
-> Country = Hungary
```

Source	SS	df	MS	Number of obs =	14
				F(3, 10) =	47.05
Model	.321773662	3	.107257887	Prob > F =	0.0000
Residual	.022794171	10	.002279417	R-squared =	0.9338
				Adj R-squared =	0.9140
Total	.344567833	13	.026505218	Root MSE =	.04774

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.1895293	.0750767	-2.52	0.030	-.3568106	-.0222481
lnUELag2	.6433563	.0925323	6.95	0.000	.4371816	.8495311
Year	-.0522755	.0058149	-8.99	0.000	-.0652319	-.0393192
_cons	112.2151	11.165	10.05	0.000	87.33793	137.0923

SWEDEN

```
-> Country = Sweden
```

Source	SS	df	MS	Number of obs =	17
				F(3, 13) =	23.61
Model	.464905824	3	.154968608	Prob > F =	0.0000
Residual	.08532787	13	.006563682	R-squared =	0.8449
				Adj R-squared =	0.8091
Total	.550233694	16	.034389606	Root MSE =	.08102

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.041247	.1180351	0.35	0.732	-.2137524	.2962464
lnUELag2	-.2751496	.093491	-2.94	0.011	-.4771246	-.0731747
Year	-.0276375	.0098178	-2.82	0.015	-.0488476	-.0064274
_cons	68.0639	20.44009	3.33	0.005	23.90576	112.222

Regression Analysis

My final r-squared values ranged from 63% in Spain to 93% in Hungary. This is a measurement of how much of my dependent variable can be explained by the independent variables. All of the r-squared values are extremely favorable. Germany and Hungary both held close to perfect values, with 92% and 93% respectively. In addition to Spain, Hungary was the only country to show the expected relationships between the variables: crime and benefits having a negative coefficient, while crime and unemployment have a positive coefficient. Since the Year variable was added only to control for time and correct autocorrelation, its results will not be considered below.

Overall, the t-statistics showed that the variable capturing the number of individuals unemployed was more statistically significant than expenditure on unemployment insurance. This was found by averaging the countries' values for each variable separately, then comparing. Benefits in Germany and Unemployment in Italy hold the correct sign but low t-statistics, leading me to believe that the values were measured imprecisely.

Sweden held the least significant results of all six regressions. It holds the lowest t-value with its coefficient of 0.35 correlating Crime to Benefits. This relationship also held the highest p-value at 0.732. Both correlation coefficients from Sweden held the opposite sign that was predicted. This supports the suspicion that has been growing ever since the first round of regression results that Sweden would not respond to the model nearly as well as more Southern nations. With the limited research that was performed for Sweden specifically, it can only be hypothesized that the Scandinavian countries hold

more effective, efficient and matured welfare regimes. Their systems were put in place years before Italy and Hungary. Perhaps it is because of this strength that the citizens are less disposed to the psychological effects of unemployment when calculating the opportunity costs of committing crimes.

Of all of the countries studied, Hungary responded best to our reduced-form model, followed closely behind by Spain. The correlation between Crime and both independent variables were of the expected sign. For every 1% increase that Hungary spends on unemployment benefits, crime rates decrease by 0.19%. For every 1% rise in unemployment, crime rates increase by 0.64%. Both of these results are statistically significant, with t-scores of -2.52 and 6.95 respectively. Both hold low p-values, at 0.03 and 0.00. The r-squared value is 93%, making it the best explanation for the dependent variable of Crime.

Spain held the correct signs in its coefficients. Its t-score is great correlating Benefits to Crime at -3.30, and decent for Unemployment at 1.21. The p-scores are 0.005 and 0.246 respectively. Unfortunately, Spain held the lowest r-squared value of all countries tested, but at 63% it is still completely acceptable.

Overall, the relationships explored in the model were not as strong as was hoped, nor were they as strong as the literature had suggested they would be. The literature had uniformly found a positive correlation between unemployment and crime rates, but such was only the case in THREE of our countries: Spain, Italy, and Hungary. These countries consistently responded positively to the model throughout the research period.

Policy Implications and Recommendations

Based on the results of Spain's regression, we see that the amount of non-violent crimes committed is elastic to both the amount of individuals unemployed and the public expenditure on unemployment benefits. For every 1% benefit that expenditure is increased, crime rates decrease by 0.27%. For every 1% increase in the number of individuals unemployed, crime rates increase by 0.09%. Spain's results responded exactly how I predicted, and corresponded with the results of the literature.

Investment should be made directly into the benefit program. This investment could be made by employers, or incentivized for individuals. Spanish citizens have been shown to respond strongly to benefit sanctions, so perhaps the limit before benefit exhaustion should remain the same while the amount of benefits received during that time increases. Upgrading Spain's welfare system to be more a part of a citizen's everyday life, similar to Scandinavian countries with more mature welfare systems, could provide a foundation to society that deters social rebellion from the start.

I would recommend that Spain do more to make a greater amount of their workforce eligible for the system that results in benefits. If more citizens have this option, more could be dissuaded from involvement in crime. Investments could be made in marketing the programs. This could be done through commissioning television commercials or internet advertisements. Public transportation systems in Spain's cities are highly circulated. The exposure that a series of bus and/or train signs would gain would be monumental, reaching millions during their daily commutes.

If more nationwide programs are implemented to lower unemployment rates, crime will also decrease. These programs should be focused towards the youth, since they are the demographic most involved in petty crime networks. Special attention should be paid to the fact that the majority of those lost in petty crime networks are male. Job creation should attract these young men while not giving them an unfair advantage over women.

Conclusion

The toughest obstacle in predicting the behavior of the Spanish population is their culture. As previously mentioned, Spain has a unique economy and welfare system characterized by strong family ties alongside benefits comparable to a nation without said ties. If programs and advertisements were designed so that the majority of the population utilizes both family connections and the benefit systems, Spain can function closer to an optimal level. Diminishing the petty crime networks would also act in interest of Spain's optimal function. If the individuals who devote time to pickpocketing, etc., were to invest their time instead to working a documented job, they would become productive members of the Spanish economy.

The inability to conduct original research on these crime networks in Barcelona or Madrid was perhaps the greatest limitation to this study. Future researchers focusing on Spain should invest in researching these crime networks, namely in Barcelona where they are the most mature. If the system is infiltrated, an anonymous survey could be distributed to the individuals in these networks to gain intelligence on their decision-making processes. The results would then be used to find more suitable variables for a

more expansive model. To gain incentive to participate, an amount of compensation (monetary, or otherwise) should be offered, particularly to account for the risk that these people would take in admitting their allegiance to an organized network. With this greater knowledge of their motivations, more effective job structures could be put in place to attract them away from a life of crime.

Future models should move past a reduced form, adding onto the variables found here. Variable choices could explore the relationship between those educated and those employed. It would also be interesting to see if the amount of time between graduating from an institution and acquiring a job is relevant to unemployment or crime rates. The institutions of higher education should be a separate variable from secondary school. Other variables could explore the effect of maintaining strong family ties in later years, such as looking at unemployment and crime rates compared to years lived at home with one's family. In the case of such a complex behavioral issue, the more variables in this model, the better.

The decision to involve oneself in crime holds financial, social, and psychological implications. Further researchers should collaborate with psychologists, sociologists, and criminologists to assemble the most complete list of potential variables. From the model that these variables will construct, more specific investments can be made in welfare and employment systems across Spain. If the model proves successful, the strategy can be implemented deeper into Southern Europe. This would bring a greater balance among the European Union's individual economies, making the Union stronger as a whole.

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Appendix

APPENDIX A
DURBIN-WATSON TEST

SPAIN

```
(2 missing values generated)

. regress lnCrime lnBenefits lnUELag3
```

Source	SS	df	MS		
Model	.142331862	2	.071165931	Number of obs	= 18
Residual	.089034896	15	.00593566	F(2, 15)	= 11.99
				Prob > F	= 0.0008
Total	.231366757	17	.013609809	R-squared	= 0.6152
				Adj R-squared	= 0.5639
				Root MSE	= .07704

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.3146866	.0642756	-4.90	0.000	-.4516869	-.1776864
lnUELag3	.1309698	.0668869	1.96	0.069	-.0115962	.2735358
_cons	13.34647	.5145493	25.94	0.000	12.24974	14.44321

```
. estat dwatson

Durbin-Watson d-statistic(  3,    18) =  1.202276

. regress lnCrime lnBenefits lnUELag3 Year
```

Source	SS	df	MS		
Model	.147168244	3	.049056081	Number of obs	= 18
Residual	.084198514	14	.00601418	F(3, 14)	= 8.16
				Prob > F	= 0.0022
Total	.231366757	17	.013609809	R-squared	= 0.6361
				Adj R-squared	= 0.5581
				Root MSE	= .07755

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.2697601	.0818287	-3.30	0.005	-.4452652	-.0942549
lnUELag3	.09495	.0783991	1.21	0.246	-.0731994	.2630994
Year	-.0041263	.0046014	-0.90	0.385	-.0139953	.0057427
_cons	21.64534	9.268853	2.34	0.035	1.765632	41.52506

GERMANY

```
. regress lnCrime lnBenefits lnUELag2
```

Source	SS	df	MS		
Model	.039608075	2	.019804038	Number of obs	= 19
Residual	1.05633678	16	.066021049	F(2, 16)	= 0.30
				Prob > F	= 0.7449
Total	1.09594485	18	.060885825	R-squared	= 0.0361
				Adj R-squared	= -0.0843
				Root MSE	= .25695

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.2657911	.5363297	0.50	0.627	-.8711771	1.402759
lnUELag2	-.3593854	.4710723	-0.76	0.457	-1.358014	.6392432
_cons	14.05099	3.532668	3.98	0.001	6.562066	21.53991

```
. estat dwatson

Durbin-Watson d-statistic(  3,    19) =  .0746471

. regress lnCrime lnBenefits lnUELag2 Year
```

Source	SS	df	MS		
Model	1.01015799	3	.336719329	Number of obs	= 19
Residual	.085786866	15	.005719124	F(3, 15)	= 58.88
				Prob > F	= 0.0000
Total	1.09594485	18	.060885825	R-squared	= 0.9217
				Adj R-squared	= 0.9061
				Root MSE	= .07562

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.1775164	.1614803	-1.10	0.289	-.5217037	.1666708
lnUELag2	-.3319539	.1386632	-2.39	0.030	-.6275074	-.0364003
Year	-.0424385	.0032577	-13.03	0.000	-.0493822	-.0354948
_cons	101.3963	6.785086	14.94	0.000	86.93422	115.8584

ITALY

```
               delta:  1 unit

. regress lnCrime lnBenefits lnUELag2
```

Source	SS	df	MS		
Model	.182994548	2	.091497274	Number of obs =	19
Residual	.148103729	16	.009256483	F(2, 16) =	9.88
				Prob > F =	0.0016
Total	.331098277	18	.018394349	R-squared =	0.5527
				Adj R-squared =	0.4968
				Root MSE =	.09621

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.0500561	.0840295	-0.60	0.560	-.2281906	.1280784
lnUELag2	.4887439	.1254228	3.90	0.001	.2228596	.7546283
_cons	9.613631	1.163399	8.26	0.000	7.147336	12.07993

```
. estat dwatson

Durbin-Watson d-statistic(  3,    19) =  .6013392

. regress lnCrime lnBenefits lnUELag2 Year
```

Source	SS	df	MS		
Model	.226291314	3	.075430438	Number of obs =	19
Residual	.104806963	15	.006987131	F(3, 15) =	10.80
				Prob > F =	0.0005
Total	.331098277	18	.018394349	R-squared =	0.6835
				Adj R-squared =	0.6201
				Root MSE =	.08359

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.0771374	.0891104	0.87	0.400	-.1127969	.2670717
lnUELag2	.2023813	.1584543	1.28	0.221	-.1353561	.5401187
Year	-.0161968	.0065065	-2.49	0.025	-.0300652	-.0023284
_cons	43.66545	13.71653	3.18	0.006	14.42935	72.90155

IRELAND

```
. regress lnCrime lnBenefits lnUELag2
```

Source	SS	df	MS		
Model	.25493338	2	.12746669	Number of obs	= 18
Residual	.138689688	15	.009245979	F(2, 15)	= 13.79
				Prob > F	= 0.0004
Total	.393623068	17	.023154298	R-squared	= 0.6477
				Adj R-squared	= 0.6007
				Root MSE	= .09616

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.1230699	.0948968	-1.30	0.214	-.3253377	.0791979
lnUELag2	-.1456131	.0882105	-1.65	0.120	-.3336294	.0424032
_cons	10.92874	.3125224	34.97	0.000	10.26261	11.59487

```
. estat dwatson

Durbin-Watson d-statistic(  3,    18) =  .9250215

. regress lnCrime lnBenefits lnUELag2 Year
```

Source	SS	df	MS		
Model	.289377209	3	.09645907	Number of obs	= 18
Residual	.104245859	14	.007446133	F(3, 14)	= 12.95
				Prob > F	= 0.0003
Total	.393623068	17	.023154298	R-squared	= 0.7352
				Adj R-squared	= 0.6784
				Root MSE	= .08629

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.0692111	.1234709	0.56	0.584	-.1956077	.3340299
lnUELag2	-.2659509	.096938	-2.74	0.016	-.4738622	-.0580395
Year	-.0125354	.0058284	-2.15	0.049	-.025036	-.0000348
_cons	35.47337	11.41556	3.11	0.008	10.98943	59.95731

HUNGARY

```
. regress lnCrime lnBenefits lnUELag2
```

Source	SS	df	MS		
Model	.137552563	2	.068776281	Number of obs	= 14
Residual	.20701527	11	.01881957	F(2, 11)	= 3.65
				Prob > F	= 0.0607
Total	.344567833	13	.026505218	R-squared	= 0.3992
				Adj R-squared	= 0.2900
				Root MSE	= .13718

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.4863297	.1937463	-2.51	0.029	-.9127625	-.0598969
lnUELag2	.0199039	.176024	0.11	0.912	-.3675224	.4073301
_cons	11.88548	.9417572	12.62	0.000	9.812683	13.95827

```
. estat dwatson

Durbin-Watson d-statistic(  3,    14) =  .7382353

. regress lnCrime lnBenefits lnUELag2 Year
```

Source	SS	df	MS		
Model	.321773662	3	.107257887	Number of obs	= 14
Residual	.022794171	10	.002279417	F(3, 10)	= 47.05
				Prob > F	= 0.0000
Total	.344567833	13	.026505218	R-squared	= 0.9338
				Adj R-squared	= 0.9140
				Root MSE	= .04774

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	-.1895293	.0750767	-2.52	0.030	-.3568106	-.0222481
lnUELag2	.6433563	.0925323	6.95	0.000	.4371816	.8495311
Year	-.0522755	.0058149	-8.99	0.000	-.0652319	-.0393192
_cons	112.2151	11.165	10.05	0.000	87.33793	137.0923

```
.
```

SWEDEN

```
. regress lnCrime lnBenefits lnUELag2
```

Source	SS	df	MS		
Model	.412892267	2	.206446133	Number of obs	= 17
Residual	.137341428	14	.009810102	F(2, 14)	= 21.04
				Prob > F	= 0.0001
Total	.550233694	16	.034389606	R-squared	= 0.7504
				Adj R-squared	= 0.7147
				Root MSE	= .09905

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.3494461	.0539271	6.48	0.000	.2337841	.4651082
lnUELag2	-.208278	.1105453	-1.88	0.080	-.445374	.028818
_cons	10.54323	.6422751	16.42	0.000	9.165692	11.92078

```
. estat dwatson

Number of gaps in sample:  1

Durbin-Watson d-statistic(  3,    17) =  .7746664

. regress lnCrime lnBenefits lnUELag2 Year
```

Source	SS	df	MS		
Model	.464905824	3	.154968608	Number of obs	= 17
Residual	.08532787	13	.006563682	F(3, 13)	= 23.61
				Prob > F	= 0.0000
Total	.550233694	16	.034389606	R-squared	= 0.8449
				Adj R-squared	= 0.8091
				Root MSE	= .08102

lnCrime	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnBenefits	.041247	.1180351	0.35	0.732	-.2137524	.2962464
lnUELag2	-.2751496	.093491	-2.94	0.011	-.4771246	-.0731747
Year	-.0276375	.0098178	-2.82	0.015	-.0488476	-.0064274
_cons	68.0639	20.44009	3.33	0.005	23.90576	112.222

APPENDIX B

MULTICOLLINEARITY CORRELATION TABLES

SPAIN

```
. correl  lnCrime lnBenefits lnUELag3 Year if Country == "Spain"
(obs=18)
```

	lnCrime	lnBene~s	lnUELag3	Year
lnCrime	1.0000			
lnBenefits	-0.7189	1.0000		
lnUELag3	0.0155	0.3817	1.0000	
Year	-0.5795	0.4528	-0.2494	1.0000

GERMANY

```
-> Country = Germany
(obs=19)
```

	lnCrime	lnBene~s	lnUELag2	Year
lnCrime	1.0000			
lnBenefits	0.0328	1.0000		
lnUELag2	-0.1461	0.4975	1.0000	
Year	-0.9254	-0.2332	-0.1032	1.0000

ITALY

```
-> Country = Italy
(obs=19)
```

	lnCrime	lnBene~s	lnUELag2	Year
lnCrime	1.0000			
lnBenefits	-0.3580	1.0000		
lnUELag2	0.7367	-0.3598	1.0000	
Year	-0.7876	0.6227	-0.7541	1.0000

IRELAND

```
-> Country = Ireland
(obs=18)
```

	lnCrime	lnBene~s	lnUELag2	Year
lnCrime	1.0000			
lnBenefits	-0.7640	1.0000		
lnUELag2	-0.7798	0.8422	1.0000	
Year	-0.5119	0.5671	0.2213	1.0000

HUNGARY

```
-> Country = Hungary
(obs=14)
```

	lnCrime	lnBene~s	lnUELag2	Year
lnCrime	1.0000			
lnBenefits	-0.6313	1.0000		
lnUELag2	-0.2347	0.4099	1.0000	
Year	-0.7410	0.5692	0.7954	1.0000

SWEDEN

```
-> Country = Sweden
(obs=17)
```

	lnCrime	lnBene~s	lnUELag2	Year
lnCrime	1.0000			
lnBenefits	0.8289	1.0000		
lnUELag2	-0.0419	0.2438	1.0000	
Year	-0.8568	-0.9304	-0.3172	1.0000

APPENDIX C

VIF TEST

SPAIN

Variable	VIF	1/VIF
lnBenefits	1.87	0.534072
Year	1.71	0.586281
lnUELag3	1.59	0.630054
Mean VIF	1.72	

GERMANY

Variable	VIF	1/VIF
lnBenefits	1.39	0.719122
lnUELag2	1.33	0.752369
Year	1.06	0.945417
Mean VIF	1.26	

ITALY

Variable	VIF	1/VIF
Year	3.45	0.289550
lnUELag2	2.43	0.411707
lnBenefits	1.71	0.584320
Mean VIF	2.53	

IRELAND

Variable	VIF	1/VIF
lnBenefits	7.23	0.138254
lnUELag2	5.16	0.193801
Year	2.21	0.452420
Mean VIF	4.87	

HUNGARY

Variable	VIF	1/VIF
Year	3.37	0.296320
lnUELag2	2.74	0.364652
lnBenefits	1.49	0.671086
Mean VIF	2.54	

SWEDEN

Variable	VIF	1/VIF
Year	7.96	0.125610
lnBenefits	7.61	0.131356
lnUELag2	1.14	0.879832
Mean VIF	5.57	