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Effect of Corporate Income Taxation on Unemployment Levels in the European Union

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Abstract

While there have been a variety of studies looking at the impact corporate taxation can have on some of these variables (most dealing with foreign direct investment and whether labor or capital bears the greater burden), the purpose of this research will be to directly study the impact that lowering the corporate income tax rate can have on unemployment levels in a country. I will be doing this through an empirical study of 15 European Union member countries, mainly due to the availability of data and the unique mobility of capital, by utilizing an ordinary least squares regression equation. Understanding the impact corporate taxation can have on unemployment is vital for a country in order to help facilitate responsible taxation policies considering it is hypothesized changes in corporate taxation can have a significant impact on unemployment levels.

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I. Introduction

Over the past 20 years, many European Union countries have seen a consistent trend in the decline of corporate income tax rates. This change can have a significant impact on the state of a country's economy, effecting variables such as overall tax revenue generated by the federal government, foreign direct investment into that country, and influencing individual firms' decisions to do business in that country. While there have been a variety of studies looking at the impact corporate taxation can have on some of these variables (most dealing with foreign direct investment and whether labor or capital bears the greater burden), the purpose of this research will be to directly study the impact that lowering the corporate income tax rate can have on unemployment levels in a country. I will be doing this through an empirical study of 15 European Union member countries, mainly due to the availability of data and the unique mobility of capital, by utilizing an ordinary least squares regression equation. Understanding the impact corporate taxation can have on unemployment is vital for a country in order to help facilitate responsible taxation policies considering it is hypothesized changes in corporate taxation can have a significant impact on unemployment levels.

Considering the relatively small number of empirical studies directly examining the relationship between unemployment and corporate taxation, and their suggestions for further research using different data sets and models, this study hopes to add to the conversation in an important way and fill any discrepancies occurring in existing literature. Looking specifically at today's environment in the United States, and the proposed changes to the current tax plan being instigated by President Trump and the Republican Party, it is inherently important to further deepen our understanding of the macroeconomic impacts of lowering the corporate income tax rate. The rest of the paper will be organized as follows: Section II will review previous empirical studies and other research papers relating to both unemployment and the impact of corporate taxation; Section III will illustrate the theoretical background to my research problem and make clear my initial hypothesis; Section IV describes both the data I will be using for my empirical model, as well as the actual empirical model I will be utilizing with a description of the dependent, independent, and control variables; Section V utilizes my data set through descriptive statistics to help illustrate my hypothesis, Section VI will describe the results of my empirical study and Section VII will use those results to discuss any policy implications derived from the

data as well as highlight the most important findings.

II. Literature Review

As previously stated, there are few studies that directly examine the relationship between corporate income tax rates and unemployment rates, but the main two that do so are performed by Feldmann (2011), who utilized a two-stage ordinary least squares regression model to analyze the impact of the tax rate on unemployment, and Zirgulis & Sarapovas (2017) who used a system general method of moments for their econometric model. While the two studies were looking at the same issue through different data sets and models, their results were quite different. Feldmann (2011) concluded that rather than having a negative impact on unemployment levels, raising the corporate tax rate would in fact be favorable for unemployment levels, lowering them over time. The primary reasoning behind these counterintuitive results was mainly based on the idea that the corporate taxes reduced the efficiency of net profits (lowering return on capital) and creating a substitution of labor for capital. It is important to note that in my research I will be arguing the opposite in that higher tax rates will create a substitution of capital for labor, which I will discuss in more depth in the theory section. The results of Feldmann (2011) showing a synchronized relationship between unemployment and corporate taxation directly contradict the conclusions made by Zirgulis & Sarapovas (2017). Through their research they were able to conclude that an increase in the expected average corporate tax rate would result in an increase in the unemployment rate. They were able to explain this through the idea that the corporate tax rates would affect the investment choices of international firms, who would move labor and capital out of an area with relatively higher tax rates. Another study that shows the same results, albeit in a different manner, is Siegloch (2014) who looked at Germany specifically which illustrated how differences in local business taxation of separate municipalities would cause unemployment to be negatively correlated to unemployment on a more microeconomic scale.

Beyond these studies that directly research the effect of corporate taxation on unemployment, there are a number that review the general effects of the tax. Devereux (2006) in particular looks at who is ultimately bearing the burden of the corporate income tax through a survey of the existing literature, and concludes that labor bears a greater burden than capital when changes in corporate income tax rates occur. While the reasoning behind this is still disputed, a couple of different studies look at the effect on foreign direct investment (FDI), which can be used as one explanation. Both Becker (2012) and Bettendorf (2009) study the impact corporate taxation has on FDI levels in a country, although only Bettendorf (2009) attempts to relate it back to unemployment levels. Becker (2012) finds that the corporate income tax exerts a

negative effect on both the quantity of capital investment, as well as the quality of the investment projects in a country, thus implying a lower tax rate will increase the amount of FDI into a country. Through a more roundabout manner, Bettendorf (2009) uses a general equilibrium model for the European Union specifically to show how stronger spillover effects of FDI can impact unemployment rates in a country.

Two other studies that more indirectly relate to corporate taxation and unemployment were performed by Chen (2017) and Zellner (2015). Of the two, Chen (2017) focused more so on the relationship between the tax and unemployment, and did so through a dynamic stochastic occupational choice model. Through this, they were able to show how lowering corporate tax rates could lead to lower unemployment rates resulting from the formation of specific organizations, depending on tax exemptions, that lead to an expansion of the labor market. More indirectly, Zellner (2015) studies the effect on growth rates in the US economy when personal and corporate tax rates were reduced. While this may not directly relate to my own topic, understanding how changes in the tax rate can affect overall economic growth (a major input into unemployment changes) is vital for the macroeconomic implications of the tax.

Besides the empirical studies that help to influence both the theory and model behind my own research, there are a couple of papers that address other important issues in a topic relating to different variables. The first was done by Bassanini (2006) which addressed some of the main variables associated with unemployment in OECD countries. It further addressed the direct effects of policies and institutions on unemployment, and interactions between these institutions. Knowing what variables to control for is crucial when performing an empirical study on such a general measure of the economy such as unemployment, and Bassanini (2006) does a good job illustrating some of the important areas to focus on. The second study was done by Sorensen (2003), who looks at the tax competition between European Union countries and attempts to evaluate what degree of tax competition within the EU is healthy and how synchronization between countries should work. Considering I will be looking specifically at EU countries, it is important to take into account some of the research he performed and what variables should be controlled for in such an open environment.

III. Theory

While the underlying relationship between corporate income tax and unemployment is evaluated on a more macroeconomic level, the theory I will be using to form my hypothesis draws its roots from common microeconomic assumptions. To begin with, as presented through the findings in Becker (2012) and Bettendorf (2009), among others, a decrease in the corporate income tax rate in one country relative

to another will increase the amount of FDI into the country with the lowered rate. One important aspect to take note of for an open economy such as the EU is that the mobility of capital will be greater than the mobility of labor. This assumption is based off the trade agreements member countries have making capital movements relatively easy, while labor participants have individual preferences towards their home country making labor mobility more sticky. Knowing this, the increase in FDI will create an influx of capital into individual firms, thus lowering the marginal productivity of capital by increasing its relative supply. This assumption will be proven to hold true as long as other variables are held constant within the firms. As a result of the lower relative productivity of capital, firms will decide to substitute labor for capital thus increasing employment and lowering unemployment rates. Stemming from this theory I then hypothesize that a decrease in the corporate income tax rate will result in a significant decrease in the unemployment rates of that country.

From a broader sense this can be explained through a firm's investment decision to move out of a country with a relatively higher corporate tax rate to one that is lower, which is especially feasible when considering mobility within the European Union. By doing so the firm brings employment opportunities as well as economic growth that ultimately works to increase employment opportunities and lower the unemployment rate. Furthermore, this movement creates a demand-pull environment that ultimately leads to unemployed individuals following and filling employment opportunities which helps in driving down the unemployment rate.

IV. Data and Empirical Model

The main data set I will be using for my independent variable is the top marginal corporate income tax rate of 14 European Union member countries including: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Swede, and the United Kingdom from the years 1993 to 2014. The data will be provided through the Tax Foundation. One aspect that makes this study unique to previous empirical studies is the usage of the top marginal corporate income tax rate as opposed to the effective corporate income tax rate. This was done intentionally in order to better capture the macroeconomic effects and policy implications of the results, as any changes in the tax rate are best seen at the top marginal level. All other data used as both the dependent variable and control variables will be derived from the OECD and the World Bank.

In order to analyze the relationship between the corporate tax rate and unemployment I will be utilizing an ordinary least squares regression (OLS) with unemployment levels in a country being the dependent variable, the top marginal corporate income tax rate (TMCITR) being the independent variable, and a

number of number of control variables to help negate outside influences on the unemployment rate. The regression (Model A) equation is calculated as follows:

$$Unemployment = a + b_1(TMCITR) + b_2(GDP/Hour\text{-}Worked) + b_3(Gov'tExp/GDP) + b_4(FDI/GDP) + b_5(UrbanPop) + b_6(WorkingAgePop) + b_7(UnionDensity) + b_8(Year) + b_9(Country)$$

In this equation I include three macroeconomic variables of overall economic growth. The first is GDP as measured per hour worked to account for Okun's Law as suggested by Zirgulis & Sarapovas (2017). The second is a control of government expenditures as a percentage of GDP to negate the impact government policy making can have on unemployment rates in a country. The third is foreign direct investment inflows as a percentage of GDP to account for the effect FDI can have on unemployment as suggested by Becker (2012) and Bettendorf (2009). Furthermore, I included two variables to help control for demographic changes that can have an impact on economic growth and thus unemployment as derived from a study by Song (2013), which are Urban Population and Working Age Population. Considering the power over wages, and thus employment, that trade unions can potentially have if a substantial portion of labor participants are union members, I included the variable trade union density to help control for this influence. Finally, I incorporated a dummy variable for each individual year and country used to account for the impact of ordinary business cycle movements and the impact they may have on unemployment, as well as country-specific factors that may not relate to the relationship between corporate taxation and unemployment.

V. Descriptive Statistics

Table 1: Tax Bracket Descriptive Statistics

Variable	Tax Bracket	Number	Mean	Std. Deviation	Std. Error Mean
Tax Rate	High Tax	154	0.3591	0.07327	0.0059
	Low Tax	154	0.2774	0.06108	0.00492
Unemployment	High Tax	154	10.5349	4.76041	0.38361
	Low Tax	154	7.0743	3.16345	0.25492
Government Expenditure/GDP	High Tax	154	19.9379	2.10422	0.16956
	Low Tax	154	21.538	3.37145	0.27168
FDI/GDP	High Tax	144	3.0234	5.1884	0.43237
	Low Tax	154	7.2471	11.06203	0.8914
Working Population	High Tax	154	66.7064	1.29172	0.10409
	Low Tax	154	66.3978	1.41252	0.11382
Urban Population	High Tax	154	22.4809	8.6292	0.69536
	Low Tax	154	19.0697	6.63683	0.53481
Trade Union Density	High Tax	146	26.5781	14.01983	1.16029
	Low Tax	150	49.0813	22.27429	1.81869
GDP/Hour Worked	High Tax	154	93.9367	7.20271	0.58041
	Low Tax	152	90.7696	10.97435	0.89014

To primarily relate the unemployment rates in a country to their respective corporate income tax rates, I divided the countries into two tax brackets – High Tax and Low Tax. The countries in the High Tax bracket include: Belgium, France, Germany, Greece, Italy, Portugal, and Spain with a cumulative average tax rate of 35.9%. The countries in the Low Tax include: Austria, Denmark, Finland, Ireland, Netherlands, Sweden, and the UK with a cumulative average tax rate of 27.7%. Utilizing these two groups, I then compared the mean unemployment rates. This comparison results in numbers that support my initial hypothesis with the unemployment rates being higher in the High Tax bracket. Furthermore, the countries in the Low Tax bracket had a greater amount of foreign

direct investment which coincides with my theory that lowering the corporate income tax rate will draw greater amounts of FDI which may potentially influence the unemployment rates. To further compare the two brackets, I performed an OLS regression using the High Tax bracket as the main independent variable and unemployment as the dependent variable. The regression equation (Model B) is as follows and the results of the regression are presented in Table 2:

$$Unemployment = a + b_1(HighTaxDummy) + b_2(GDP/HourWorked) + b_3(Gov'tExp/GDP) + b_4(FDI/GDP) + b_5(UrbanPop) + b_6(WorkingAgePop) + b_7(UnionDensity)$$

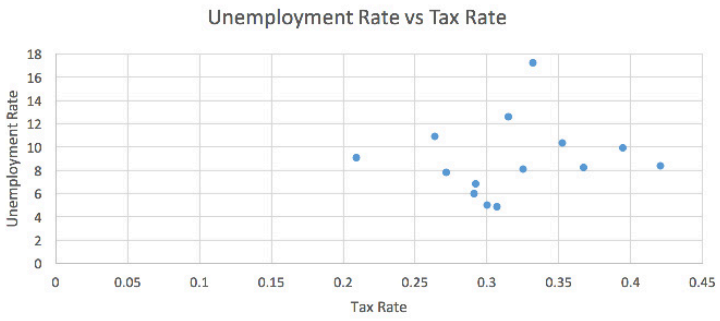
Table 2: Regression Results for Model B

Varible	Coefficient	Std. Error	P-Value
(Constant)	17.705	15.225	0.246
HighTax	3.519	0.593	0.000 ***
GvtExpGDP	-0.093	0.113	0.412
FDI_GDP	-0.043	0.028	0.125
WrkgPop1	-0.100	0.207	0.629
UrbanPop	0.023	0.033	0.487
UnionDensity	0.019	0.015	0.192
GDPhrwrd	-0.033	0.027	0.226
R Squared	0.185		
Adjusted R-Squared	0.164		

***Significance at the 1% level
**Significance at the 5% level
*Significance at the 10% level

This simple regression further supports my theory with the High Tax bracket variable being significant at the 1% level and with a positive coefficient suggesting the higher the corporate income tax, the higher the level of unemployment. While the regression created results that support my hypothesis, the r-squared value of 0.185 is below what would be preferred and there is a lack of significance seen in the FDI variable (contradicting my hypothesis) which suggest the need for another regression (Model A). However, to help illustrate the relationship between corporate tax rates and unemployment rates, I have included a graph (Table 3) of the average tax rates and unemployment rates for each country over the given time period. For the most part, one can see the direct relationship between the two rates as the general trend is upward sloping helping to reinforce the results of Model B and my initial hypothesis, with only one relative outlier (Spain) seen with an average unemployment rate of around 17%.

Table 3. Average Unemployment and Corporate Tax Rates



VI. Results

Table 4: Regression Results for Model A

Variable	Coefficient	Std. Error	P-Value
(Constant)	98.74	20.813	0.000 ***
TMCITR	4.97	4.462	0.267
GvtExpGDP	0.467	0.178	0.009 **
FDI_GDP	-0.001	0.022	0.949
WrkgPop1	-1.014	0.234	0.000 ***
UrbanPop	-1.36	0.268	0.000 ***
UnionDensity	-0.057	0.095	0.548
GDPlagged	0.144	0.05	0.004 **
Austria	-13.821	2.308	0.000 ***
Belgium	-16.046	3.172	0.000 ***
Denmark	-14.12	3.517	0.000 ***
Finland	-7.92	3.601	0.029 *
France	-11.714	3.645	0.001 **
Germany	-27.014	6.879	0.000 ***
Greece	4.171	1.697	0.014 *
Italy	-13.886	3.171	0.000 ***
Netherlands	-35.463	7.443	0.000 ***
Portugal	12.092	4.627	0.010 *
Spain	1.621	2.465	0.511
Sweden	-22.836	4.664	0.000 ***
UK	-4.157	1.4	0.003 *
D1994	0.326	0.972	0.751
D1995	-0.446	0.968	0.645
D1996	-0.528	0.978	0.589
D1997	-1.047	1.002	0.297
D1998	-1.908	1.042	0.068
D1999	-2.766	1.048	0.009 **
D2000	-3.971	1.098	0.000 ***
D2001	-5.132	1.12	0.000 ***
D2002	-5.285	1.149	0.000 ***
D2003	-5.245	1.192	0.000 ***
D2004	-5.255	1.256	0.000 ***
D2005	-5.557	1.304	0.000 ***
D2006	-6.353	1.359	0.000 ***
D2007	-6.998	1.414	0.000 ***
D2008	-7.198	1.437	0.000 ***
D2009	-5.751	1.529	0.000 ***
D2010	-5.174	1.586	0.001 **
D2011	-4.826	1.631	0.003 **
D2012	-3.813	1.679	0.024 *
D2013	-4.044	1.746	0.021 *
D2014	-6.278	2.37	0.009 **
R-Squared	0.716		
Adjusted R-Squared	0.692		

***Significance at the 1% level
**Significance at the 5% level
*Significance at the 10% level

The results of my regression comparing the corporate income tax rate and the levels of unemployment in a country are shown in Table 4. Conversely to what I initially hypothesized and the implications of my descriptive statistics and simple OLS regression utilizing the specific tax bracket, the top marginal corporate income tax rate in a country has an insignificant effect on the level of unemployment seen in the country, albeit with a positive coefficient. Similar results were seen when performing the same regression while utilizing a one-year lagged effect based on the theory that a change in the tax rate could have an impact on the year after the change due to delayed responses and the stickiness of labor and capital. There are a number of reason that may potentially explain these counterintuitive results, mainly stemming from possible issues associate with my theory.

First, the results illustrate an insignificant relationship between foreign direct investment and the unemployment rate. This contradicts the findings of a few different studies, particularly Becker (2012) who concluded that higher levels of corporate taxation can have a negative impact on both the quality and quantity of FDI investment. The possible disagreement between our two studies may then be explained by focusing on the quality of foreign direct investment into a country, and where specifically the funds are ending up, rather than the quantity. Another explanation as to why my empirical model created insignificant results is that labor is equally as mobile as capital. This would negate the effect of any changes stemming from foreign direct investment decisions as labor would move with it, ultimately leaving unemployment levels unchanged.

VII. Conclusion

While the sign of my corporate taxation variable was positive, indicating a direct relationship between the tax rate and unemployment rates which coincide with the findings of Zirgulis & Sarapovas (2017), the statistical insignificance of the impact shown make drawing major conclusions somewhat difficult. However, if one focuses on the topic Devereux (2006) focused on in his review of literature as in the effect taxation has on labor versus capital, there may be potential policy implications as my research implies capital may in fact bear a greater burden. The discussion, in terms of tax policy making, may then steer away from the impact lowering corporate income taxes has on the labor market, and thus normal citizens of a country, and towards the effects changes may have on individual firms and their profitability. Policy makers can then focus on how taxation effects corporations individually, and how those corporations utilize extra funds from potentially lowering the corporate income tax in a way that ultimately benefits the consumer or labor market as a whole.

As my findings are rather mixed and partially contradict those of other studies looking at the direct relationship between unemployment and corporate taxation, I believe further research is necessary to properly determine the legitimate effects. However, I think it is safe to conclude a strong possibility for a direct relationship between corporate taxation and unemployment rates exists. For future studies, utilizing the effective corporate income tax rate rather than the top marginal rate may result in more statistically significant numbers. Furthermore, I believe using a larger data set of a greater number of countries outside the European Union may also present the researcher with better results as there potentially exists complex variables that could impact unemployment, outside of the normal variables, when looking at a union specifically. There is also a lack of statistical diversity within the European Union as the majority of countries have lowered the corporate income tax rate, with very few instances of the tax being raised.

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