The Effects of the European Integration on Economic Growth

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Abstract

This paper tests the effect of European Integration on the growth of the European Countries, by defining European Integration in terms of Single Market and Fiscal Convergence, whilst accounting for the different membership positions within the European Union. The main finding is that accounting for Single Market Integration, EU membership boosts economic growth by 0.6%. However further Integration in terms of Eurozone membership and Schengen both negatively affect growth by 0.62% and 0.52% respectively. The sample covers twenty-four of the current twenty-eight EU members, and the model uses a Weighted Least Squares Panel regression, with economic growth defined by the change in GDP per capita.

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Introduction

The motivation for this paper arises from a quote from the current President of the European Commission, Mr Jean Claude Juncker; "Europe must be about more than market, goods and money". Now why is this relevant? The European Plan is of further integration, and from this quote it wouldn't be unreasonable to envision a singular European State. These are significant changes to the European culture and have and will continue to effect over five-hundred-million citizens. Another reason why the topic of European Integration is particularly relevant is the 2016 vote in the UK. This paper is not a paper discussing the potential effects of Brexit to the British and European economies; instead we can estimate the effect of European Integration to the economic growth.

The formal theory surrounding regional integration is from Bela Balassa (1963), indicating the step-by-step process to achieve complete regional integration. The steps begin by initially removing some tariffs in Preferential Trade Agreements (PTAs), this converts into a Free Trade Agreement (FTA) whereby no trade is subject to tariffs. A Customs Union includes free trade with the addition of a common external tariff. The other factors have free movement within a Common Market, and Monetary Union requires a common currency. The next step of integration, partners the Monetary Union in terms of policy effects, and this is a Fiscal Union whereby central control of government expenditure and taxation. Political Union completes the process of integration.

The specific European Integration steps can be found in Table 1, and what is clear from this is that firstly the theory does somewhat simplify these steps. Another caveat of Balassa's theory of regional integration is the lack of distinction between vertical and horizontal integration, when looking at Table 1 we can see that the two are in fact not mutually exclusive.

Given the relevance of this topic, this paper will propose the following statement: European Integration has no effect on the economic growth of the European economies. To test this hypothesis, we first have to define European Integration, and doing so this paper aims to define each country heterogeneously in terms of their European Integration. This will take the form of accounting for convergence in the European Single Market and Fiscal Behaviour relating to membership of the EU, and by using a Weighted Least Squares panel regression; we measure the growth given by the GDP per capita to appropriately see the direct effect to the half-a-billion EU citizens, over the years 1996-2016. The baseline results indicate that European Integration, when accounting for the Single Market convergence boosts the per capita GDP of the European countries. However, these results also show that membership of

the Eurozone and Schengen offset these effects. The Fiscal convergence yields no significant results but should still be reported.

The project will first discuss the European Integration and then survey the literature surrounding the question of European Integration and economic growth. Following that, the empirical analysis and data will be described, yielding the results section of the paper. Then the caveats of this discussion will commence.

1. History of European Integration

In this section, I will briefly discuss the history of cooperation and policy coordination in the European sense, and then link back to the theory of Regional Integration from Balassa (1963).

1.1 Vertical Integration

As stated above, Regional Integration is not one dimensional in the European context; I like to define vertical integration as the traditional sense of integration whereby the members of the bloc increase their coordination and therefore their interdependence on each other. In terms of the European Continent, this was the central point of the Industrial Revolution driving the 'Smaller World Hypothesis' through trading with each other and driving global colonisation. The end of the 19th Century brought strong growth in the region, however the impact of both of the World War's lead to the destruction of many European Nations. At the end of World War Two, the United States (US) came together with the leaders of Europe to create the Marshall Plan (1948). This agreement was to ensure that war in Europe was not an option and a greater sense of cooperation existed between the countries. After the funds from the US began to rebuild Europe, the Continent looked to coordinate the region. The Coal and Steel Community (1950) was the first step of trade integration, comprising of the 'Original Six'. In 1957 the Treaty of Rome was initiated, creating a Common Market, often referred to as the 'European Economic Community' (EEC). It became a Customs Union in 1968 with a greater protection of the Agriculture within the region. In 1992 the Maastricht Treaty was ratified which transformed the EEC into the

Table 1 – Vertical and Horizontal Integration in Europe

Vertical Integration	*Horizontal Expansion*
1957: Common Market	Original Six: Belgium, Netherlands, Luxembourg, Italy, Germany, France
1968: Customs Union	
	1973: First Enlargement; UK, Ireland, Denmark
	1981: Greece
	1986: Spain and Portugal
1992: Treaty of Maastricht	
1995: Schengen Introduced	Austria, Sweden, Finland
1999: Eurozone Introduced	
	2004: CEE10[1]
	2007: Bulgaria and Romania
2009: Lisbon Treaty	
	2013: Croatia

European Union and paved the way for the introduction of Monetary Union in 1999, by providing the criteria for convergence[2] and also created the Single Market. Finally, in 2009 more parliamentary power was handed to the European Union through the Lisbon Treaty. Future integration can be adhered to by assessing the 'Five President's Report' (2015), which pushes for a closer Union, specifically addressing the plans to first update the economic union, whilst also determining the mechanisms for fiscal and financial union.

1.2 Horizontal Integration

Horizontal integration can be defined as the widening of the Union. This can be measured by the Expansions of the Union. The actual expansions will be described in the table above, alongside the vertical steps to make comparisons as to the state of the Union when each expansion took place.

Of course, in 2016 the United Kingdom voted to leave the European Union, it is yet to be seen what relationship the UK and the EU will have once the departure is complete. It is also important to stress the fact that countries can be vertically integrated into Europe without being full members for instance Switzerland and Iceland who participate in the Single Market and Schengen without being full members of the Union. This paper will only focus on the EU members, but there is scope to consider these countries.

[1] CEE10 countries are the following: Estonia, Cyprus, Malta, Slovakia, Slovenia, Czech Republic, Latvia, Lithuania, Poland and Hungary.

[2] Discussed further in section 3.1 (pp.14)

2. Literature Review

From humble beginnings, European Integration was intended to merely act as a form of cooperation between the European Nations. Fast-forward seventy years, and there is shared institutions between European countries, as well as policy coordination and in the not too distant future, full Economic Integration[3]. This process of Regional Integration has happened at a very fast pace and has vast economic implications. The literature assessing different ways European Integration has affected members, this paper will consider only those that have captured growth effects, as growth captures the income of the entire country.

To distinguish the differences in previous literature, we must consider how different authors have approached European Integration and Growth Modelling. The authors of previous literature have applied three generalised measures to European Integration: firstly in terms of various fundamentals such as trade or monetary union; then expansion of members and therefore markets; and finally applying more sophisticated models such as Indices of European Integration. There is also different econometric methodologies used, as well as different countries and periods applied across all the papers, so the scope for direct comparison of results is restricted. Instead this Literature Review will compare the different ways of measuring European Integration and then discuss the conclusions and limitations of individual papers.

The first measure of European Integration we can determine is Trade. Henrekson *et al* (1997) was one of the earlier papers discussing European Integration in terms of trade. The model of European Integration is very simple, as the paper compares if a country is within the European Community or European Free Trade Area and assesses the effects on GDP growth. The paper included a regression on growth of GDP with a dummy variable for EC/EFTA membership. The model is limited and falls into the trap, like many other papers, defining European Integration as homogeneous amongst all members. Despite this limitation, the paper finds that the coefficient of the dummy variable for European Integration is positive and significant, whilst also finding that the cause of the increasing growth rate was due to technological transfer as opposed to investment, which follows partially the conclusions of the Solow Growth Model[4].

To further develop Henrekson et al (1997), Badinger (2001) adapted the econometric approach to separate growth into technology and investment, with both temporary and

[3] See the Five Presidents Report (2015), from the European Commission.
[4] See Solow (1956)

permanent effects. The measure of integration is also in terms of trade, controlling for the effects of the General Agreement on Tariffs and Trade (GATT). In his analysis, Badinger finds that if no economic integration had taken place, between 1950 and 2000, GDP would be one-fifth lower. Interestingly, Badinger attributes two-thirds of this result towards GATT unilateral liberalisation of tariffs. Although a valid contribution, this paper does not account for positive integration features including non-tariff barriers, such as common institutions and policies, which means this paper can only partially explain the effect of European Integration. Mann (2015) instead evaluates how successful European Integration has been for growth of East European countries, who joined the EU in 2004 and 2007. The main findings are that there are medium-run growth effects, found from a regression subject to the Augmented Solow Growth Model. Due to a lack of data, the approach of an index is deemed not possible. Instead this paper uses trade as a proxy, whereby European Integration is defined as trade with EU27 as a percentage of total trade. This measure has stronger implications than Henrekson, as countries are weighted on how integrated they are within Europe in terms of trade. The issues apparent are that a country not in the Eurozone could have a higher trade ratio than a country inside of the Eurozone, whilst being defined as more integrated. This expresses a clear example of the potential limitations of this measure, and therefore limits the conclusions.

There are other forms of integration we can isolate as potentially capturing European Integration, such as monetary union. Luque and Taamouti (2013) want to assess the effect of fundamental economic measures and if adopting the Euro affects these. Accounting for the first twelve members of the monetary union by using a panel regression from 1980-2011, they find that adopting the Euro and losing control of independent monetary policy that many macroeconomic fundamentals are affecting growth. De Grauwe (2006) somewhat explains these differences through Optimum Currency Area Theory, and that without full Economic and Monetary integration, using Balassa's (1963) definition, there will be issues within the Eurozone. Luque and Taamouti (2013) do clarify that much of the dispersion is due to the Financial Crisis of 2008, but De Grauwe (2013) reiterates the point that "the Euro is a currency without a country", which implies that had the European Union had a common fiscal institution, maybe the effects of the financial crisis would have been somewhat limited.

We now assess the Literature with regard to European Integration expressed by an increase of EU members. With the exception of Badinger (2001), the issues with using trade and tariff analysis is that the global tariff liberalisation is not distinguished from European Integration.

Similarly, by isolating a single variable as "integration" the papers fail to capture the total effect of European Integration. Instead many author's define European Integration in terms of European Expansion, as it allows us to compare growth of accession countries before and after Integration takes place. Deardoff and Stern (2002) apply a theoretical model based off increasing returns to scale and conclude that the incumbent members gain from expansion, whilst having mixed success from countries that join later. The authors also had doubts that European Integration has any affect on long run growth. Any theoretical model without any econometric basis draws limits on any conclusions, and it's also worth considering that their analysis fails to include the largest expansion of the EU in 2004, highlighting the limited scope of their research.

Another approach to capture the effects of European Expansion is through synthetic counterfactual analysis and is used by Campos *et al* (2014). By using a difference in difference measure, the authors take each enlargement of the EU between 1973 and 2004, and compare GDP performance and labour productivity had the accession countries not joined the EU. The conclusions are that, on average, GDP per capita would be 12% lower. Austria and the countries of the 1973, 1986 and half the 2004 expansions saw large gains in GDP and labour productivity. It follows that there were smaller effects for the remaining 1995 expansion countries, as well as Poland, Czech Republic and Slovakia. This paper found that only Greece would have had higher GDP and labour productivity if they had never joined the European Project. Any counterfactual analysis is subject to many unknowns, and having been held over many years reduces the likelihood of *ceteris paribus.* In particular to this paper, the conclusions do not consider effects to the Original Six members, and perhaps more importantly, fails to address that Europe became more integrated over the period and does not distinguish the effects of each integration point. This is fundamental as the CEE countries did not join the same Bloc as the 1973 expansion, and therefore the latter captures mainly the single market effect, whilst the former capture the whole European Union, which limits the defendability of Campos *et al's* analysis.

Another approach related to expansion would be countries actually leaving. Crafts (2016) tackles the issue of European Integration in terms of what would happen if the UK left the European Union, or "disintegration". By surveying the literature and data analysis regarding growth, Crafts finds that European Union membership has increased GDP per capita by 10% per year, which is greater than the 1.5% GDP cost of membership. This is a comparison of UK GDP as members of the EU against EFTA membership. Like Deardoff and Stern, this paper has no econometric model, so when accounting for the validity of the conclusions, we

must be cautious. The comparison of different countries also falls in to the traps of Campos, by taking the year a group joined and comparing the growth per capita.

By not accounting for individual weighting in terms of European Integration, we assume first that all countries are equally integrated within Europe, as well as each step towards integration carries the same weight in terms of effect on growth. The first is certainly false, as the UK is not in the eurozone and therefore less integrated than Belgium. It would also be a fair assumption that the steps towards integration (monetary union/single market access etc) do not have identical effects on growth. Therefore, to measure European Integration, data must be collated on various integration variables, and then weighted based off how each stage of integration affects growth.

Rapacki and Próchniak (2009) apply a regression, derived from beta and sigma convergence, to define GDP growth by two sub-factors: eight growth variables from the convergence models and four measures of European Integration. The measures in terms of European Integration include; Foreign Direct Investment, Economic Freedom, Transition Indicator, and Aid. The analysis is regarding the CEE-10, who joined in the EU in 2004, thus the paper focuses more about convergence to the EU average levels, but this can only be achieved through European Integration for these countries. They find, similarly to Mann (2015), that European Integration leads to convergence of the CEE 10 bloc, which in turn caused high growth rates for these countries. There is limitations in this paper, namely that the variables used for European Integration, such as Freedom and Transition, could be inflated by the fact that many countries came from Ex-Soviet backgrounds where these variables would naturally be much lower. A similar comparison would be the 'Golden Age of Economic Growth in Europe' whereby the European Community countries were destroyed, and consequently their GDP retracted significantly, and therefore recovery inflated growth to return to post-war GDP levels. Another critique would be the fact that Slovakia and Slovenia joined the Eurozone whilst many other CEE10 countries did not, so again this paper falls into the trap of homogenising the Bloc, also not mentioning the effects to the incumbent members.

A more sophisticated model of Integration would be from König and Ohr (2013). They manage to capture European Integration in terms of: the Single Market; Homogeneity; Symmetry; and Conformity, and through a weighting procedure manage to rank the European Countries in terms of how integrated they are in the years of 1999 and 2010. Despite not having clear mathematical calculations, there is substance to their approach, as their findings

seem fairly realistic on the face of it. For example, countries that are not in the Economic Monetary Union cluster together in terms integration scores. This paper does not apply the index to measure growth, and one outstanding issue of König and Ohr (2013), is that they use the cyclical growth data which may skew the results of their final index as the European countries economic cycles are more likely to align given the nature of European Integration. Therefore it is essential to utilize the approach of scoring each country in terms of European Integration and compare how the precise level of integration affects the economic growth of the European Union Members.

3. Empirical Analysis

This section will explain firstly how to capture Vertical and Horizontal Integration of the European Countries, and then secondly formulation of a growth model to test the impact of the different measures of European Integration.

3.1 European Integration Measure

Stated many times throughout this paper, I want to stress the importance of the heterogeneity in terms of European Union membership. To avoid homogenising the bloc, we need some way of differentiating the European countries within Europe. One obvious way is to look at the membership options, but to capture European Integration this is necessary but not sufficient as we again fall into the homogenous trap, by saying all countries who have the same membership status are equally integrated. This is an issue in the sense that if we take say Italy and France, both countries are members of: the EU, the Eurozone and the Schengen Area for the same number of years, and to then say these countries have the precise same relationship in Europe would seem unclarified. To counteract this assumption, consideration to different European Union policies is necessary to see if there exists a convergence within the Union.

Inspired from König and Ohr(2013) who created an index for European Integration, I believe a better approach would be to consider *how* integrated each country is in the European Union. In their paper they account for a single market index, based off the flows of the Four Factors, which have free movement in the European Single Market. They also include indices for other macroeconomic fundamentals, including the

business cycle, in terms of their homogeneity and symmetry indices. Finally, they apply a conformity measure based on European Court of Justice Violations.

This precise calculation is not perfect when testing the effect of the integration on economic growth as there exists collinearity issues as the cyclical nature is part of their index. Alas, the single market measure is an important consideration in which European Countries can deviate in terms of integration.

Another important policy of the European Union, which was part of the Maastricht Treaty (1992) is the Euro Convergence Criteria. This was the policies set out by the European Commission to ensure that before the Euro currency was introduced, the countries had sustainable performance in terms of government finance, interest rates and inflation.

To capture the Convergences, we use the following formula:

$$Convergence = 1 - \left| \frac{(Value_{i,t} - Median_{i,t)}/Median_{i,t}}{Max\ Value\ ((Value_{i,t} - Median_{i,t)}/Median_{i,t}} \right|$$

By using the median instead of the mean the score will robust to extreme outliers and for the late 1990's there exists some very large outliers. After applying this formula each country in each year will receive the median deviation score, a number between 1 and 0. The closer the score to 1, the closer the value to the median and so greater is the European Convergence and therefore the Integration.

Single Market

In König and Ohr's (2013) Single Market Index, they apply the approach of measuring the EU single market flows[5] by two measures. First are the EU flows as a percentage of total flows, and then they take the EU flows as a percentage of Gross Domestic Product.

Due to the lack of data available I cannot apply the same measure and also the lack of accurate service data, due to World services having very little barriers to trade, this model will only consider labour, goods and capital.

Again, as the data for labour flows are so inconsistent[6] we instead approach with an economic argument to justify the use of the unemployment rate. When there is free movement of labour, we assume that if there are deficits in one country and a surplus

[5] The flows being Goods, Services, Capital and Labour.

[6] The data is inconsistent as there are no requirements for countries to record their inflows of labour and so we do not have accurate data.

in another, that the rational labour who is unemployed will move to the country where they can get a job. In this sense, we are considering how well the host country can attract the labour. Of course, this is not the only factor that drives the employment rate in a given country, and we also have to look at the literature surrounding Optimum Currency Area to actually see how flexible European citizens are to move to another country within the Union, as there may be constraints such as language barriers but we can still apply the economic intuition as a proxy for measuring labour mobility in the EU. Solely using the unemployment rate does not hold well for European Integration as the same economic logic can be used for international labour market integration, and so by applying the above Median deviation formula, can see how the unemployment rate in a given year convergences to the European average.

An interesting paper from Svirydzenka (2016) attributes all of the fundamental measures that account for capital market performance and generate a Financial Development Index. An immediate question would be to ask why that is relevant to European Integration. The link is that when a country is part of a single market, and for some countries a monetary union, their external capital controls are set by the European Union. This means that all twenty-eight members abide by the same rules, meaning internal and external investors follow the same regulations. This should facilitate intra and extra-EU flows and increase their financial development, and so we can use these scores to measure capital in the single market. Again, applying the median deviation formula, we can find the relation to the EU average for Financial Development, making the measure relevant to European Integration.

Another fundamental factor is the trade in goods. For this measure there is sufficient data to allow measuring the importance of EU trade. This paper will take the value of Intra-EU trade of a country and divide that by the value of total trade. By using this measure, we can say how integrated a given country is within the goods market in the EU, as measures the trade with the twenty-seven other members.

Fiscal Convergence

The Convergence Criteria stated in the Maastricht Treaty was originally designed to stabilise the European Countries before they aligned their currencies and the policies have developed over time for example, now including the Stability and Growth Pact.

Table 2 – Original Convergence Criteria		
Aim	*Technical Measure*	*Target*
Price Stability	Consumer Price Inflation Rate	Not more than 1.5% above the three best performing
Sound Public Finances	Government Deficit as % of GDP	Not more than 3%
Sustainable Public Finances	Government Debt as % of GDP	Not more than 60%
Durability of Convergence	Long-term Interest Rates	Not more than 2% above the three best performing in terms of Price Stability
Exchange Rate Sustainability	Deviation from Central Rate	Participation in ERM for two years without severe tensions

The original criteria focused on five main areas, specified in Table 2 above whereby to join the Euro the countries must follow the guidelines of these rules. As this is a major policy it is essential to include when defining European Integration.

As we are looking to use these criteria over a time period once some countries have already joined the Euro, we will ignore the final row of the table and focus our analysis in terms of Public Finances, Interest Rate performance and Price Stability.

These measures will also follow the median deviation calculation due to issues with the target rates, namely being that other policies such as the Stability and Growth Pact came into effect, making the original criteria somewhat redundant. There is also great evidence for inconsistent enforcement and punishment in regard to exceeding these policies, but the sentiment exists that the measures used are important when considering European Integration.

The Exchange Rate is a difficult measure as nineteen of the twenty-eight current members are in the Eurozone and therefore is excluded from this analysis.

By taking the deviation we are not measuring how effective is price stability in terms of economic growth, we instead consider does converging to the European Union average price stability have an effect on economic growth.

Membership

Another measure we need to consider is that there are different membership options of the European Union. An example that I considered when I discuss the motivation for this topic, as well as my criticism of the existing literature, is that for instance, Sweden is currently not a member of the Eurozone whilst France is. Rationally if we ignore this effect for Eurozone participation, we will ignore the effects of the

differences in national currency. This is problematic, as intuitively I could argue that an investor in France will consider the exchange rate stability when investing in overseas assets. If the investor had the opportunity to invest in Sweden (not in Eurozone) or into Germany (in the Eurozone), the currency removes some of the uncertainty which will affect the investors final investment decision. If we aggregate this effect to the whole European economy, we may see the effect of being in the Eurozone. The same argument can be made for the Schengen Area whereby boarders within Europe are essentially removed, and that without the restrictions across mainland Europe, the movement of peoples may have a more efficient labour market equilibrium. We also account for European Union membership to control for the expansions discussed in section. These dummy variables proxy the horizontal memberships over time, as the countries of Europe do not have homogenous memberships in the Union and so there is a need to distinguish them.

The way in which this is determined is given simply by dummy variables for membership of the European Union, the Eurozone, and the Schengen Area, for a given country in a given year.

3.2 Growth Methodology

Now we have controls for European Integration, we can look at what happens to growth as countries integrate. When looking for a model specification, we need to test the variables described above to see the effect of European Integration on growth.

Economic growth can be interpreted in many ways; this model will focus on GDP per capita growth. This is because it accounts for the standard of living within a given country which better serves the motivation described in the Introduction of this paper.

The base model will take the following form:

$$\Delta y_{i,t} = y_0 + \Delta k_{i,t} + \lambda EU + \lambda Eurozone + \lambda Schengen + \Delta Prices_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $\Delta y_{i,t}$ is the growth rate of GDP per capita and y_0 is the value of GDP per capita in the base year 1996. $\Delta k_{i,t}$ is the growth rate of the Gross Fixed Capital Formation (GFCF) and λ represents the dummy variables for different membership positions in the European Union. $\Delta Prices_{i,t}$ represents the growth in the median deviation of the Consumer Price Inflation.

The growth of GFCF is used to measure for capital stock growth without considering the depreciation as this shows the growth of Investments which is a fundamental driver of the economy. Traditional models account for labour quality with a usual measure being the Years of Schooling; this has been excluded from this model due to accurate data records every five years and this model is annual growth.

The model allows us to consider convergence within the Single Market and Fiscal policy separately to isolate the effects.
The first variation of (1) will be for the Single Market:

$$\Delta y_{i,t} = y_0 + \Delta k_{i,t} + \lambda EU + \lambda Eurozone + \lambda Schengen + \Delta Prices_{i,t} + \Delta Labour_{i,t} + \Delta FD_{i,t} + \Delta Goods_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where we simply apply the growth rates of the convergence for labour; the unemployment rate, capital; the Financial Development Index and the growth of the proportion of Intra-EU trade out of total EU trade to control for goods.

The second variation applies the Fiscal Policy:

$$\Delta y_{i,t} = y_0 + \Delta k_{i,t} + \lambda EU + \lambda Eurozone + \lambda Schengen + \Delta Prices_{i,t} + \Delta Debt_{i,t} + \Delta Deficit_{i,t} + \Delta Interest\ Rates_{i,t} + \varepsilon_{i,t} \quad (3)$$

Again, the regression remains the same, instead we allow the growth in convergence for the government debt to GDP, government deficit to GDP and the Long-Run Interest Rates. Although price stability exists within the Convergence Criteria, we will use across both regressions as this variable does not have much direct inference to the other fiscal measures but indirectly impacts the Single Market variables and the Fiscal policy measures so must be included in both.

By separating the regressions by policy type we will get a picture of how the convergence of different European policy measures has affected, if at all, the growth of these countries. To reiterate the point, European Integration in these models is given by converging to the average rate, noting that these results are not to say that for instance "Higher Debt to GDP implies a coefficient of X on growth". Instead the results will show that converging to the EU average will have an effect on GDP per capita. This is an important distinction to make as to not mis-interpret the results.

The econometric model used is the Weight Least Squares Panel Model. There is no specific paper this model will follow, as the measure of European Integration is an extension of König and Ohr (2013) who do not apply regression analysis and so interpretation of European Integration is unique, at least with these variables. The model also allows for time dummies.

4. Data Description

The data for this test is used in the time period 1996-2016 for all EU28 members apart from: Croatia, Estonia, Luxembourg and Malta due to severe missing data. The data descriptions will be comprised in Table 5 of Appendix A.

As this model uses data over several years, we need to ensure that the real values of variables are used to exclude the offset effect caused by inflation. This issue is of particular concern for the variables in Table 5, which is why the constant PPPs is used for GDP per Capita Growth, and then using Chain linked volumes for the components. When considering the variables used to measure integration, particularly the Single Market Index, is not the perfect measures. Unemployment was used as a substitute to directly measure the labour market flows between countries but due to the constraint, this measure from AMECO is the strongest alternative. Similarly, the Financial Development Index does not capture the flows of Capital within the EU perfectly, and ideally this data would capture the relative importance of interactions with the rest of the EU. Although, both these measures show European Integration as the result of being members of the Single Market. Following the economic rationale, it should follow that Unemployment and Financial Development should increase with membership of the Single Market, but not all countries will have the same gain and so specific labour and capital measures all for the heterogenous relationship of a country and the Single Market. The Fiscal Convergence measures are the specified measures stated in the Convergence Criteria so the selection process for that index was straightforward. The dummy variables show the difference in membership option and are essential to generate an accurate Index for European Integration and can be found simply by reading through the EU website to determine the year a country joined the bloc with dates also for Eurozone and Schengen.

The data is selected for these years firstly to consider how the Expansion countries have interacted within the European Union in terms of the Single Market. Then secondly to see

how convergence in fundamental Fiscal variables affects growth, given the Financial Crisis and Sovereign Debt Crisis both exist during this time frame, it will be interesting to see if convergence has any effect on the growth. This is because the EU has an idea for a Fiscal Union in the future, and assuming a legitimate Fiscal Union will converge these variables, then we can infer how the Fiscal Union will affect growth from this model. This model won't capture how monetary and fiscal policies will interact which may caveat any implication as no policy is used in isolation.

5. Results

This section of the paper will discuss the results of the regressions stated in CH4, and then describe the economic implications. After there will be a brief comparison to the results in the found in the existing Literature, and then any caveats in the analysis will be further explored.

Table 3 displays the results for five regressions. Columns 1, 2 and 3 display the pooled and fixed effects models, for the both the single market and fiscal variations. After seeing these models fail, we instead apply the Weighted Least Squares approach, displayed with both sets of controls in Columns 4 and 5, which will be the points of reference hereafter.

Observing Table 3 displays particularly interesting results. The immediate point of note is that none of the Fiscal Policy convergences show any significance whilst the three Single Market measures show varying levels of significance. This does not mean that Fiscal policy does not have any effect on the GDP per capita of a country; instead it indicates that there is not clear reasoning to say that converging to the European average for Debt and Deficit to GDP and Interest Rates has a sufficient effect on the economic growth. Conversely, we find that convergence to the European average in regard to Unemployment, Financial Development and Share of EU trade are significant. Column 4 of Table 3 also shows significance in relation to membership options within the EU. In both models, percentage change in Price convergence yield insignificant results.

Controlling for the Single Market leads to a positive significant result for the European Union membership, whilst negative coefficients for Eurozone and Schengen membership at the ninety-nine and ninety-five per cent confidence level respectively. The immediate implications of these results show that countries that have been a member of the European Union over the twenty-one-year period from 1996-2016 experience an overall positive

Table 3 – Panel Estimates of Economic Growth

Variables	OLS Pooled (1)	Fixed Effects (2)	Fixed Effects (3)	WLS (4)	WLS (5)
Constant	2786.66*	2944.12**	459.25	629.297	−511.78
	(1554.5)	(1466.33)	(1083.95)	(853.777)	(643.7)
Initial GDP	$-0.1053\ 10^{-3}$***			$0.\ 9740\ 10^{-4}$***	−9.36791e-05
	(1.73E-05)			(1.12E-050)	(8.86E-06)
ΔK	$-0.7292\ 10^{-2}$***	$-0.6739\ 10^{-2}$***	0.1589***	$-0.5708\ 10^{-2}$***	0.1847***
	($0.9187\ 10^{-3}$)	($0.8949\ 10^{-3}$)	(0.01255)	(1.45E-03)	(1.09E-02)
EU	0.6852	0.6075	−0.5491	0.6021*	−0.5600
	(0.501)	(0.5261)	(0.6366)	(0.3637)	(0.5281)
Eurozone	-0.4935	−1.660***	−1.5234***	−0.6250***	−0.4745***
	(0.3028)	(0.5066)	(0.4574)	(0.1741)	(0.1297)
Schengen	−0.9541***	−1.161**	−0.7906**	−0.5189**	−0.2679
	(0.3247)	(0.4931)	(0.4009)	(0.2326)	(0.1744)
ΔLabour	$0.9172\ 10^{-2}$***	$0.7114\ 10^{-2}$***		$0.7762\ 10^{-2}$***	
	($0.2197\ 10^{-2}$)	($0.2152\ 10^{-2}$)		($0.2310\ 10^{-2}$)	
ΔCapital	−1.83377e-05**	−1.66251e-05**		−1.38626e-05**	
	(7.20E-06)	(7.07E-06)		(6.67E-06)	
ΔGoods	0.0706	0.0642		0.07332*	
	(0.0429)	(0.0412)		(0.03811)	
ΔPrices	$-0.3490\ 10^{-2}$	$-0.3851\ 10^{-2}$	$0.4273\ 10^{-2}$	$-0.3007\ 10^{-2}$	$-0.2985\ 10^{-3}$
	($0.3554\ 10^{-2}$)	($0.3412\ 10^{-2}$)	($0.3082\ 10^{-2}$)	($0.2523\ 10^{-2}$)	($0.2158\ 10^{-2}$)
ΔDebt			$-0.4838\ 10^{-3}$		$0.7578\ 10^{-3}$
			($0.2891\ 10^{-2}$)		($0.1655\ 10^{-2}$)
ΔDeficit			$0.8657\ 10^{-3}$		$0.1980\ 10^{-3}$
			($0.7290\ 10^{-3}$)		($0.4878\ 10^{-3}$)
ΔInterest Rates			$0.1295\ 10^{-2}$		$-0.1406\ 10^{-2}$
			($0.2786\ 10^{-2}$)		($0.2264\ 10^{-2}$)
Observations	433	433	370	433	370
R-squared	0.5508	0.5376	0.7224	0.6620	0.8230
Number of country	24	24	24	24	24
H	0.000	1.10E-283	0.000		
D-W		0.00593347	1.000		
Pesaran	0.222	0.416	0.324	0.00635	0.00585

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The tests are also recorded for the p-values where; H is the groupwise Heteroscedasticity test, D-W is the Durbin-Watson test, and Pesaran measures the Cross-Sectional Dependence.

growth effect, to typically contribute 0.602% of the per capita GDP growth. This paper references European Integration and considering the theory, the EU is currently in the fifth step of Balassa's Regional Integration process, discussed in the introduction (pp.5), which represents Monetary Union. Testing for Eurozone membership yields a negative coefficient

of 0.62%, whilst also being in the Schengen will contribute another negative 0.52% to economic growth. When we consider a country that is a member of all three memberships, whilst controlling for Single Market convergence, the net effect of membership is the sum of the coefficients, which in this case approximates to a negative effect of 0.54% on economic growth. Do these results indicate that the European Central Bank should close, and the current Schengen countries should start "building walls"? Not necessarily. All that we can infer from these results is that European Union Countries who are part of the Eurozone and Schengen Zone experienced an overall negative effect to per capita GDP growth when accounting for the Single Market heterogeneities. Another way of analysing is to group the countries based on their positions within the bloc; see Table 4 in Appendix A.

If we distinguish these countries in the sample who joined the EU in prior to 2004 and thereafter; it is clear that ten of the EU14 members have "complete membership", whilst only four of the Expansion countries are included as complete. Noting also that half of the Expansion members are not yet Eurozone members, whilst considering that these countries were poorer before they joined, they are likely to converge to the incumbent member's growth rates. This convergence relationship exists for the Single Market measure: intra-EU trade in goods, as the coefficient in Column 4 of Table 3 attributes a 0.07% boost to per capita GDP growth for a 1% increase in European Trade reliance.

Following Solow's (1956) predictions regarding convergence to the steady state of growth, this result is not too surprising. We cannot say definitively that country's that are in the Eurozone and Schengen Area are richer, but we can say that this model accounts for the following: in 2000, pre-accession of the Expansion countries, none of these countries were in the Schengen or Euro Area and so any growth effects from membership is likely to coincide with the fact that the richer countries were measured. This is an important consideration as the more developed a country is, the more difficult it is to sustain higher levels of economic growth. In analogy, France would find it more challenging to grow at the same pace as say Slovakia due to the starting point of the analysis, whereby in 1996 France's resources are used more efficiently than Slovakia. Development of the Slovakian economy leads to capital and labour being used more efficiently and the hence a higher return to growth than that of France. This model does appear to capture this effect.

All of that being said, we cannot disregard the Eurozone and Schengen Area as having no effect on GDP per capita growth. De Grauwe (2013) discusses the limitations of having a monetary union without a fiscal union, and this paper covers both the Financial Crisis and the

Sovereign Debt Crisis, where there was evidence of a prolonged negative growth for some Eurozone countries.

Returning to the Single Market coefficients, it is clear to see that converging to the average European Unemployment rate boosts growth, whilst converging to the median Financial Development score reduces the growth, albeit by a very small proportion. The inference we can take with these results is that converging to the European average unemployment change helps economic growth whilst diverging from the average Financial Development change indicates growth. These results are very small in the context of growth but still significant.

The Economic implications of Column 5 of Table 5 certainly are limited, the only significant result relating to the European Integration displays a negative coefficient for Eurozone countries. As stated above, this is not surprising given the issues Eurozone countries have experienced, namely the PIIGS who are all complete EU members. The convergence in fiscal measures are all insignificant for the growth and so using these as controls for heterogeneity limit the analysis and have no statistical inference.

To compare these results to the Literature we must allow for the fact there is no direct comparison to this paper. Alas, the Literature does typically find that the European Integration, however it be defined, has a positive effect on the economic growth of the European Nations. For the papers who use trade as a proxy, we must compare the total effect but also consider the Single Market Model. Henrekson et al found that being in the EC/EFTA increased growth, Badinger (2001) also found that regional integration boosted the growth, mainly through tariff liberalisation and Mann (2015) achieved evidence for medium-run growth effects. Direct comparisons to these papers are not conclusive but we do find that when accounting for trade, European Integration has a positive effect for economic growth. Badinger(2001) justifies this through tariff analysis, but given the difference in sample years selected between his and this paper, and relatively how there has been little change in tariffs in the years of this paper, a more appropriate control could be some globalisation measure. In a sense this would aim to capture "Global Integration" opposed to "Regional Integration" and has scope for further research. Other groupings in the literature overlap in the sense of the more sophisticated model that accounts for regression analysis in terms of economic growth, apply their models to countries to a sample of countries that have joined the European Union.

Similarly, to Campos et al (2013), this paper finds a positive growth effect for the Expansion countries, if we use the Eurozone and Schengen acting as proxy for incumbent and expansion counties, although at a lower rate compared to their Difference in Difference model. Rapacki and Próchniak (2009) focus more on the convergence of the CEE10 countries to the EU

average growth and make predictions when the expansion countries will converge to the EU level of growth. This model does not make those same predictions but supports the growth effects from convergence within the Single Market.

The frustrating limitation of this analysis is the lack of data. I believe that the intra-factor flows within the European Union could certainly better capture single market integration, and the limitations of data particularly for the Expansion countries does caveat the analysis.

It has also been difficult to isolate the effects of vertical and horizontal integration, namely due to the two not being mutually exclusive. Other Econometric issues include using the median deviation, it is robust to outliers but arguments supporting mean deviation are abundant. However, this analysis does contribute to the literature in terms of reassessing the measures of Regional Integration, and despite the fiscal measures having no significance in this case; it certainly acts as a base for further research.

6. Conclusion

This paper aims to test the hypothesis that European Integration has no effect in terms of economic growth. The purpose of answering this question is to see if the economic and political coordination has actually increased the European citizen's standard of living. To measure European Integration this paper defines the European Integration in terms of Membership status, Fiscal Convergence and Single Market Integration. The results show that European Integration, when accounting for Single Market Integration, has boosted the standard of living for EU members. Interestingly the integration does have negative coefficients for deeper membership for Eurozone and Schengen area countries. Why these results are important when considering European Integration? Looking at Tables 1 and 2 we see that Europe is not yet fully integrated, and so a smaller or negative return to growth *could* mean that further integration could have minimal effects for economic growth, or in other words, growth maximisation could be achieved at a lower stage of Balassa's Theory. Following on from this potential conclusion, we could see that a Fiscal Union *may* have no effect on the economic growth of European Countries. This follows from Column 5 of Table 3; Fiscal Convergence has no significance in the Growth Rates. This anticipation is not conclusive as this model does not consider tax integration, which of course is part of fiscal policy. There is evidence to in this paper to support the idea that Eurozone membership decreases economic growth by 0.62% and a justification for this could be found by De Grauwe (2013), who argues "the Euro is a currency without a country", and a Fiscal Union

could have reduced the negative effects of the Eurozone Crisis. If this analysis is accurate, then the coefficients could have been different had there been an efficient Political Union.

This paper adds to the Literature by first adding another dimension to European Integration by considering the Fiscal Convergence as a policy measure of the European Union. There are of course improvements that could be explored. Perhaps the economic growth approach could look at the fundamental growth variables[7] with other controls variables to see what in particular is driving the GDP per capita growth. Mentioned previously the data constrains provide difficulty in isolating European Single Market Integration and so this could be explored with more reliable data in the future.

The take-home message of this paper, what we can say definitively, is that the European Union at this in-between stage of Economic Integration is not the most efficient and is probably justification for the plans of the Five Presidents to further integrate. This paper simply describes the convergence of European policies, and the effect on the economic growth. To fully discuss European Integration and the European Union, there needs to be discussion on the Political Integration of the Union to supplement the economic analysis, with the aim of answering the key questions that are driving the concerns within Europe, that drove the Brexit Vote in 2016.

[7] Fundamentals being Consumption, Investment, Government Expenditure and Trade.

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Appendix A

Table 4 – Country Memberships

Country	*EU / EC*	*Euro Area*	*Schengen Area*
Austria	1995	1999	1997
Belgium	1957	1999	1995
Bulgaria	2007	X	X
Cyprus	2004	2008	X
Czech Republic	2004	X	2007
Denmark	1973	X	2001
Finland	1995	1999	2001
France	1957	1999	1995
Germany	1957	1999	1995
Greece	1981	2001	2000
Hungary	2004	X	2007
Ireland	1973	1999	X
Italy	1957	1999	1997
Latvia	2004	2014	2007
Lithuania	2004	2015	2007
Netherlands	1957	1999	1995
Poland	2004	X	2007
Portugal	1986	1999	1995
Romania	2007	X	X
Slovakia	2004	2009	2007
Slovenia	2004	2007	2007
Spain	1986	1999	1995
Sweden	1995	X	2001
United Kingdom	1973	X	X

Table 4 shows the years a Country joined various membership options within the current EU framework. An “X” indicating the country is not

Table 5 - Data Descriptions

Variable	Technical Measure	Source	Date Extracted
Labour	Unemployment rate: total :- Member States: definition EUROSTAT (ZUTN), % of total population	AMECO	22.03.19
FD	Financial Development Index	IMF	29.03.2019
Goods	Imports / exports of goods, Millions US$. final calculation = EU / total trade	IMF	25.03.2019
Prices	All items HICP, annual average rate of change, %	Eurostat	24.03.2019
Long Term Interest Rates	EMU Convergence Criteria Bond Yields (10 Year)	Eurostat	23.03.2019
Deficit	General Government, net lending and borrowing, % of GDP	Eurostat	23.03.2019
Debt	General Government Debt Total, % of GDP	Eurostat	23.03.2019
GDP per Capita	Gross Domestic Product (Expenditure Approach), Per head, US $ constant prices, constant PPPs, OECD base year (2010)	OECD	20.03.2019
K	Gross Fixed Capital Formation, Chain linked volumes (2010), million euro	Eurostat	20.03.2019