Growth and Immigration: An Econometric Analysis of Current European Union Member States from 1990 to 2009

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GROWTH AND IMMIGRATION:
AN ECONOMETRIC ANALYSIS OF CURRENT EUROPEAN UNION
MEMBER STATES FROM 1990 TO 2009

by

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ABSTRACT

Economic growth and immigration are important issues to individuals and governments alike. This paper looks at previous research on the topic of how migration affects growth and finds that most research finds that immigrants increase growth in at least the long run. First global or widely applicable research is discussed, then the paper focuses on the European Union as its data availability and uniform open migration policy lend it to a panel regression analysis. Three models are estimated using World Bank World Development Indicators data from 1990 to 2009 for all 28 current EU member states. The models are largely inconclusive, with the only significant result for the relationship between the stock of international immigrants and real GDP per capita growth being negative and coming from Model 1. However, in Model 1 domestic investment was also significant with a negative impact on real GDP per capita. With no clear answer to the question of how immigration affects growth, the clash between the EU governing body which uses open migration policy to promote growth and anti-immigration political parties in EU member states that see immigration as harming native citizens' job prospects seems likely to continue.

ACKNOWLEDGEMENTS

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INTRODUCTION AND REVIEW OF PREVIOUS RESEARCH

Economic growth is a primary goal for all countries as it is usually associated with a higher standard of living and quality of life for citizens. Because growth is so important, especially in light of the recent recessions around the world, it is important also to consider ways to achieve growth. One such way is through migration. Migration can increase growth in both receiving countries (the countries net labor moves to) and home countries (the countries net labor moves from). In general, receiving countries are developed countries – those countries with relatively high incomes (real GDPs), a high level of technology and industrialization, and also a relatively larger percent of people living in cities as opposed to rural areas. Home countries are generally developing countries – basically the opposite of developed countries, with relatively low incomes, a lower level of technology and industrialization, and a relatively large percentage of workers in agricultural fields and in rural areas.

There are two general types of labor: skilled and unskilled. Skilled labor is labor that requires knowledge or expertise to perform – e.g. doctors, lawyers, welders, mechanics, teachers, etc. Unskilled labor is labor that requires little knowledge to perform – assembly line workers, serving, retail (cashiers and stockers), etc. As one might expect, developed countries usually have higher levels of skilled labor while developing countries have higher levels of unskilled labor. Developing countries do still have skilled laborers; however, the commonly cited "brain drain" is a well-known example of skilled labor migration.

Much research has been conducted on both economic growth and migration in the European Union (EU), due, to the fact that both are visible and important to citizens and their governments. The goal of this paper is to provide more empirical evidence on the topic of labor

migration in the EU in general, a topic largely unexplored, and to provide some insight into migration policy for EU countries that stems from the results of this analysis and other papers.

Relevant Economic Theory

Economic growth is an increase in the total income of a country (or other type of region). Usually real GDP is used to measure total income, and so an increase in real GDP from one year to the next is positive economic growth (an expansion) and a decrease from one year to the next is negative economic growth (a recession). Real GDP measures output in a monetized way, meaning that even though it is measured in a currency it does not simply measure the amount of money earned in an economy; it accounts for inflation by using a base year's currency values for all goods. This allows real GDP to measure the increase or decrease in the value of goods/services produced in a country. So while growth occurs when output increases, a country can only produce more output through using more inputs (labor and capital) or through improving the quality of the existing inputs (e.g. higher education for labor and better technology for capital). This means that growth occurs when labor either increases in quantity or quality (quality of labor is referred to as productivity) or when capital, the tools that labor uses to make output, either increases in quantity or quality (new and better technology increases the quality of capital).

This paper studies the effect of the stock of international migrants on the real GDP per capita growth in EU member countries. Real GDP per capita is simply the real GDP divided by the total population of a country. This is a more powerful measure than real GDP alone because it takes into account the fact that immigrants increase the population of the home country; i.e., it

is possible for international migrants to have a positive effect on the real GDP of a country but actually reduce the real GDP per capita or standard of living in that same country. This is something that policymakers are no doubt more concerned with than simply real GDP as a whole.

Just as there are markets for goods and services, there are also markets for labor and capital. The labor market is of particular interest to the discussion of labor migration. A labor market is constructed in the same way as the market for a good. There is a downward sloping demand for labor and an upward sloping supply. The price of labor is referred to as the wage. Because labor in-migration causes an increase in the supply of labor, it puts downward pressure on the wage level in the receiving countries. Conversely, labor out-migration causes a decrease in the supply of labor which puts upward pressure on the wage level in home countries.

As net migration increases, the quantity of labor increases, which can be beneficial for economic growth. It is important to note though, that labor only increases output if it is employed. So labor migration into a region with no available jobs will not yield growth unless new jobs are created. Optimal conditions for a country to accept inward labor migration then, are an abundance of unfilled jobs; while optimal conditions for a country to promote outward labor migration are high unemployment levels. And countries in general hold native-held jobs as better than migrant-held jobs due to the nature of elections. Delving slightly into policy considerations here, high unemployment stresses a government's ability to serve the people as tax revenues decrease with decreased income, the budget must increase to assist the unemployed if the government has any kind of unemployment insurance, and voter dissatisfaction generates turmoil for the political system (in very extreme cases leading to rioting or even revolution). Note, on the

receiving country side, migrant laborers cannot vote, so conditions for migrants are decided by the natives that can vote.

Trade is also an important dimension of economic growth. As trade becomes less restricted (freer), both trading countries benefit through specialization in producing more of particular goods and services resulting in overall more total goods and services for both countries' consumers to enjoy; not to mention the increase in the variety of goods available to countries that trade (Japanese cars, Chilean coffee beans, English tea, etc.). As discussed earlier, economic growth is an increase in the total value of goods and services produced, an increase in output. This higher level of total goods and services between trading countries comes from their ability to specialize in the production of certain goods – producing more of them and trading with the other country for the other goods. The next section contrasts freer trade and freer labor movement between countries, establishing the relevance of trade to this discussion.

The Current State of Research

Much research has been conducted on the potential effects of trade liberalization (freer trade in goods and services) on the global, regional, and individual country scales. Interestingly, Walmsley and Winters (2005) show with their GMig model that complete trade liberalization (the elimination of all trade restrictions on goods and services globally) would result in an estimated total global gain in real GDP of $104 Billion (1997 prices). However, increasing the number of migrant laborers, in their analysis by 3% of the labor force of each country (meaning that home countries lose 3% of their labor force and receiving countries add 3% to their labor force), would result in a global gain of $156 Billion (1997 prices). This finding suggests that the

greatest gains to be made in international economic policy will come not from freer trade, but from increased labor migration. In effect, there seem to be diminishing returns to free trade. The following paragraph explains what effects found in the Walmsley and Winters' model caused the increase in global real GDP.

Most migrant laborers send remittances back to their respective home countries in the form of some of their wages. These remittances are then spent in the home countries, increasing consumption spending in those countries and therefore increasing real GDP. This causes growth so long as the remittance sent back to the home country is higher than the wage that would have been earned in the home country. If unemployment is very high in the home country it is foreseeable that the potential wage in the home country would have been zero for some migrants, meaning that all of the remittance is added to the real GDP of the home country. This increase in real GDP would lead one to expect that developing countries benefit more from increased labor migration, and this is found to be the case. Global real GDP in the model also increased through higher skilled wages in the home country. This is caused by skilled laborers leaving the home country in search of higher wages, causing the domestic wage rate to rise. Developed countries manage to benefit in the model through an increase in the rental rate of capital that offsets reductions in both skilled and unskilled wages, which leads to an overall increase in Real GDP. The rental rate of capital is simply the price of capital. It increases because labor becomes relatively more abundant in the receiving country due to more labor migrating into the country which causes capital to become relatively more scarce – this scarcity causes the rental rate to increase. As the number of skilled and unskilled laborers increases in the receiving country the labor supply increases, resulting in a reduction in wages for both types of laborers in the

receiving country. So the rental rate of capital increases, but wages decrease (this is a finding from the GMig model). An interesting question is how this impacts the income distribution in the receiving country. While the aggregate income in the receiving country may increase, generating growth, the owners of capital gain while labor loses (in terms of a reduced wage). This does not necessarily mean that increasing migrant labor is bad, just that there is more to consider than simply growth from a policy perspective. Similar to free trade, while overall beneficial, there are winners and losers to increased labor migration.

There are some other important considerations also. Røed and Schøne (2012) found that in Norway (not an EU member), immigrant labor reduces regional differences in unemployment rates and wages because migrants are more mobile within the receiving country than country natives. Emphasizing this same idea is Niebuhr, et al (2011) who found a very similar result in Germany, implying that this finding might be able to be applied more broadly. These papers suggest that migrant labor makes receiving countries' economies more responsive to regional differences in unemployment rates and wages. This would mean that there would be fewer locations where unemployment is concentrated in the receiving country. Reducing the concentration of unemployment would be useful, as such concentration causes a number of social and policy issues. Natives fail to be as mobile since they are rooted to locations by the costs of moving from one region to another due to family and acquaintance ties, making them less sensitive on the whole to unemployment and wage concerns. This reduction in the number of "bad spots" in the receiving country may have a number of benefits. It helps reduce the likelihood of particularly severe recession conditions in certain areas since the entire country will have a relatively uniform unemployment rate. This means that there will be no areas (or fewer

areas) with very high rates of unemployment, instead unemployment will be more uniformly distributed throughout the country as a whole. This does not only benefit particular locales with fewer of the economic costs associated with recession, like decreased local consumption and decreased local investment; it would also help alleviate some of the political/governmental issues that arise as well. As will be addressed later, political issues are likely to be the most difficult hurdles to overcome with regard to increasing labor migration across country lines. Governments and natives in receiving countries tend to view migration as a bad thing; migrants are viewed as job taking and as culturally less important than natives. With respect to governments specifically, both local and national governments tend to spend more during recessions to try to encourage growth out of the recession. By potentially reducing the effects of the recession, labor migration could also help reduce government spending and other stresses on governments during recession. If migrant labor is able to reduce the effects of recessions in some way, this would help make support for policies that encourage labor migration more likely.

One would assume then that these effects stemming from freer labor migration would cause fewer regional unemployment differences in receiving countries where labor migration is high, but empirical evidence seems to be to the contrary in the United States. In the U.S., though there is a high amount of interregional (and also international) migration, there are still large unemployment disparities found by Lkhagvasuren (2012). In fact, the model constructed in that paper finds that labor mobility and unemployment are actually negatively related – a finding very different from the research discussed, but one that does, in fact, fit the U.S. unemployment data when looked at on a regional level. Lkhagvasuren finds that "some workers move to, or stay in, a location with high unemployment because they are more productive there than elsewhere." It

seems to follow from a laborer's perspective that they would stay in a location where they have the highest productivity since this helps them achieve the highest wage; further, it stands to reason that in an area with lower unemployment there could be more laborers working fewer hours each or being paid a lower wage.

All of this research addresses two distinct, but related, events: cross-country migration and intra-country migration. Cross-country migration is the migration responsible for the economic growth found in the Walmsley and Winters model, while intra-country migration is responsible for the more uniform regional unemployment rates found in Norway and Germany. However, as discussed, migrant labor from other countries is more likely to respond to changes in wage and unemployment rates by moving to a different region in the receiving country; effectively demonstrating that cross-country migration increases intra-country migration. Thus, it is reasonable to attribute benefits of intra-country migration to cross-country migration also. This allows the investigation of the costs and benefits of both to be performed in one combined assessment.

To investigate labor migration requires also considering how likely and/or feasible policy is to increase labor migration among countries is. From the impacts discussed so far, it seems that policy aimed at increasing immigration would be viewed unfavorably from voters' perspectives; most citizens of developed countries do not want the likely reduced wages that would exist in receiving countries as a result of increased labor migration. On the side of developing countries, they would likely consider more emigration (particularly temporary emigration) quite favorably as this is already largely the case. Some additional issues such as cultural issues and "brain drain" concerns could make policy somewhat less likely. But the

general consensus seems to be that it is the developed countries that are less likely to promote

labor migration. A very notable exception is the EU. Each EU member state citizen, in addition

to citizenship of their member state, has EU citizenship which confers "the right of citizens of

the Union to move and reside freely within the Member States" (Europa) among other rights.

The first form of this right appeared in the Treaty of Paris in 1952, which enabled citizens to

move for work purposes. Although the collection of states at that time was not yet called the

European Union, the idea of free movement of labor and the inter-connectedness that brings

existed more than 60 years ago. This makes the focus of this paper, the EU member states, a

natural set of countries to investigate in order to gauge the impact of migration on growth.

However, high levels of migration and its perceived cultural threat to natives has been met with

the rise of anti-immigration political parties in many EU states (Kosulya 2012). Is this perceived

threat an economic one? Or is the rise of these viewpoints related only to cultural identity? While

these questions cannot be answered by this paper, an answer to the question of whether or not

there is an economic threat from immigration could be found which might lend or remove

legitimacy to this anti-immigration viewpoint.

Research Specific to Growth

There is a fair amount of research that looks at how growth is affected by immigration in

individual member states of the EU though few papers that investigate the impact of immigration

across the entire EU. This paper employs a panel regression method to investigate the effect.

Kim, Levine, and Lotti (2010) find that migration is beneficial for receiving countries and

the world growth rate, but that it is possible that unskilled labor migration actually decreases

world growth, though this possibility is noted as unlikely. Huber and Tondl (2013) find that net migration induces growth in real GDP per capita across the EU27; definitions for the EU15, EU27, and EU (the same as the EU28) are available in Appendix A. However, Guner and Yaliniz (2013) find that for the EU15 countries immigration will have a negative effect on economic growth due to their draw on social security systems and Brücker (2011) in a metastudy of many papers on the subject finds that in the EU immigration does indeed reduce wages and increase unemployment in receiving countries in the short term but not in the long term. And Jonkers (2011) finds that in the EU27 immigration has reduced labor shortages and that migration has become an important policy tool for the EU for maintaining growth and restoring the EU economies after the 2008 global downturn.

From this selection of research on the topic it appears there is not much of a consensus on the topic of migration being beneficial for receiving countries, though the policy of the EU implies that it is beneficial. This paper seeks to provide evidence for or against the claim of migration's benefit.

DATA

The data used for this analysis comes from the World Bank World Development

Indicators Database. The relevant years for the data are 1990 through 2005 in 5 year increments

(1990, 1995, 2000, and 2005) due to the lack of previous years' availability in the database. The

countries that are used in this panel regression analysis are the 28 countries that are current EU

members (as of 2014). While not all of the current members were members at the beginning of

the panel, it is reasonable to expect more of a connection between the countries that are now

members and the members in 1990 than other countries in the region since receiving membership

status takes several years, in addition to the simple cultural and locational ties that these

countries have exhibited for many years.

The variables that are used are **Growth** – total percent growth in per capita GDP over the

5 year period including and after the year listed (for example **Growth** in 1990 is the total

percentage growth in per capita GDP from 1990 to 1994), **Migrant** – the stock of international

migrants in the country as a percent of total population, **Trade** – the sum of imports and exports

of goods and services as a percentage of GDP, **CapForm** – capital formation (in this case total

domestic investment net inventories) as a percentage of GDP, **Labor** – the total labor force,

AgeDep – the age dependency ratio (those aged 15 or younger and 65 and older per 100 of the

working age population), and **Govt** – government consumption spending as a percentage of

GDP. No clear nonlinear relationships were displayed in scatterplots of the variables (**Growth**

with respect to time and all other variables with respect to **Growth**). These scatterplots are

available in Appendix B. A human capital measure was not available for this time period for

enough countries to be useful and so it was omitted. A clear goal of further research in this area

would be to include a human capital measure. Barro (1996) conducts a panel regression analysis

of the entire world to evaluate growth and includes a measure of school enrollment rates in the beginning of the period of study to capture the stock of human capital that would be available over the following years of the study. Further study would require human capital measures as well as other controls.

ECONOMETRIC ANALYSIS AND RESULTS

Table 1: Variable Descriptions

Label	Description	Obs	Mean	Std. Dev.	Min	Max
Growth	Total per capita GDP growth over 5 years**	199	14.01672	15.08179	-43.8904	85.79274
Migrant	Stock of international migrants as a percentage of population	212	6.708715	6.18934	0.2438021	33.57655
Trade	Trade (Exports + Imports) as a percentage of GDP	198	85.95481	45.99447	21.33913	286.1524
AgeDep	Age Dependency Ratio	252	52.21058	5.786809	39.74818	75.49689
CapForm	Domestic Investment as a percentage of GDP	195	24.33703	5.301035	12.40091	53.31139
Labor	Labor Force	112	8209558	10300000	138552.1	41300000
Govt	Government Spending as a percentage of GDP	202	18.49429	4.452671	7.208813	36.25955
SelfEmp	Self employed persons as a percentage of GDP	125	18.6048	9.787219	2.9	50.7
FDI	Foreign Direct Investment as a percentage of GDP	156	3.686654	5.105634	0.0000261	26.65321
Unemp	Unemployment Rate	115	8.668696	4.405984	0.6	22.7
Enrollment	Adjusted net enrollment rate in primary education	75	96.4464	4.22213	78.8221	99.98815

**Note: Total Growth is calculated by the following method: for example total Growth for 2005-2009 (Percentage growth in 2005 + 1)*(Percentage growth in 2006 + 1)*…*(Percentage growth in 2009 + 1) = Total GDP per capita growth from 2005 through 2009 (* denotes multiplication).

Since no clear nonlinear relationships were found in the scatterplots, the econometric function is specified as OLS and linear in all variables. The data is specified as a panel with cross-sectional units Country (in this case an alphabetically ordered ID variable: Austria – 1, Belgium – 2, etc.) and time units Year (1990, 1995, 2000, and 2005). **Growth** is the dependent variable while all others are explanatory variables. While data is available for some of the explanatory variables over a longer period of time, in order to include all 6 explanatory variables required reducing the time interval of the panel to four five-year intervals as the stock of international migrants is only available every five years. The variables included in this regression represent some of the variables that affect per capita GDP growth. Namely, a measure of investment in the form of capital formation, a measure of the number of immigrants in each country which is the variable of interest, the size of the labor force, the amount of government spending, and the age dependency ratio. This is Model 1.

Before discussing the results of Model 1, a brief explanation of fixed and random effects in panel regression is useful. Random effects mean that there is only one intercept because each country does not have fixed over time differences. Fixed effects mean that each country has its own intercept in order to account for fixed over time differences such as institutions, culture, and policies. So random effects being appropriate would suggest that the countries do not vary in institutions, etc., while fixed effects being appropriate would suggest that the countries do vary in such fixed over time.

Country cross-sectional units imply fixed effects estimators since they have institutions and demographics that vary by country but are fairly stable over time. Additionally, a more rigorous approach using the Hausman test reveals that indeed fixed effects estimators are the

proper method for this panel analysis as opposed to random effects estimators. Table 3 displays these results. The P-value of 0.000 verifies that the fixed effects estimators are better than random effects estimators for this model.

Table 2: Hausman Test Model 1

	Coefficients			
	Fixed	Random	Difference	Standard Error
Migrant	-2.852054	-.0911507	-2.760903	1.018165
Trade	.0938494	.0410568	.0527926	.0645605
CapForm	-1.674659	-1.143186	-.5314736	.2140398
Labor	-8.06e-08	-1.56e-07	7.57e-08	2.52e-06
AgeDep	-1.257769	-1.04567	-.2120993	.3285825
Govt	1.13845	.3563777	.782072	.5497896
	Test: Ho: Difference in coefficients not systematic (Random is appropriate)			
	Prob>chi2 (p-value) = 0.0000			

Perfoming the panel regression, the results in Table 3 are obtained. **Migrant** has a negative coefficient and is significant at the 95% confidence level, the same being the case with **CapForm. AgeDep** has a negative coefficient and is significant at the 90% confidence level while **Labor**, **Govt**, and **Trade** are not significant at the 90% confidence level. The negative coefficient **CapForm** is a bizarre result. For each percentage increase in the stock of international migrants, growth is estimated to fall by an average of 2.85 percent per capita. Model 1 as a whole tests significant. It is the other results that make this author wary of the results of this panel in general. It is not consistent with economic theory for capital formation to be negatively correlated with growth. The explanation for this seems to be omitted variables bias. Misspecification of the functional form is possible, but the scatterplots mentioned previously do

not clearly point to a particular nonlinear relationship between for any of the variables. To test

this issue, more variables are employed.

Table 3: Model 1 Regression

Fixed-effects (within) regression			Number of Obs=108	Number of groups =28
R-sq: within = .4071				
Obs per group: Min = 2	Avg = 3.9	Max = 4		F(6,27) = 5.33
				Prob>F = 0.0010
Growth	Coefficient			Robust Std. Error
Migrant	-2.852054*			1.229604
Trade	.0938494			.0883744
CapForm	-1.674659*			.6253834
Labor	-8.06e-08			2.46e-06
AgeDep	-1.257769			.682681
Govt	1.13845			.7575476
Constant	103.5788*			41.98903
Note: * Denotes that coefficients are significant at the .05 level.				

The explanatory variables **SelfEmp** – the percentage of workers that are self-employed,

Unemp – the unemployment rate, **Enrollment** – the percentage of primary school age children

that are enrolled in school, and **FDI** – foreign direct investment as a percentage of GDP are

included in the panel regression as Model 2. The results are no longer best estimated through

fixed effects estimators as the Hausman Test fails for this set of explanatory variables (Table 4).

However, the model is likely not properly identified due to the lack of data availability – there

are 66 total observations, but 11 parameters to estimate. The results (Table 5) are similarly

bizarre. Only **Labor** and **Unemp** are significant at the 95% confidence level. As the size of the

labor force increases, the model estimates that growth decreases and as the unemployment rate

rises, the model estimates that growth increases - again not in line with economic theory; though

it is possible that increases in the labor force are taking some of the effect of population increase

and thus decreasing the growth as it is measured per capita.

Table 4: Hausman Test Model 2

	Coefficients			
	Fixed	Random	Difference	Standard Error
Migrant	1.497744	.0466282	1.451116	1.154826
Trade	.0626613	-.0080503	.0707116	.102447
CapForm	-.9466289	-.5862395	-.3603894	.5743225
Labor	-1.24e-06	-4.91e-07	-7.16e-07	2.36e-06
AgeDep	.0972965	.1747855	-.077489	.6205241
Govt	-1.367919	-1.399869	.0319498	1.002516
SelfEmp	.7659054	-.4275414	1.193447	.82148
FDI	-.231572	-.3302365	.0986645	.1923482
Unemp	1.55654	1.655746	-.0992062	.8459376
Enrollment	.3633366	-.1854309	.5487675	.4912899
	Test: Ho: Difference in coefficients not systematic (Random is appropriate)			
	Prob>chi2 (p-value) = 0.4731			

Table 5: Model 2 Regression

Random-effects GLS regression		Number of Obs=66	Number of groups =24
R-sq: between = .4071			
Obs per group: Min = 1	Avg = 2.8	Max = 4	Wald chi2 (10) = 51.39
			Prob>chi2 = 0.0000
Growth	Coefficient		Robust Std. Error
Migrant	.0466282		.3980096
Trade	-.0080503		.0729264
CapForm	-.5862395		.4442134
Labor	-4.91e-07*		1.62e-07
AgeDep	.1747855		.4385724
Govt	-1.399869		.8077382
SelfEmp	-.4275414		.2471034
FDI	-.3302365		.291169
Unemp	1.655746*		.4714205
Enrollment	-.1854309		.3657112
Constant	63.07733		56.69468
Note: * Denotes that coefficients are significant at the .05 level.			

Govt and **SelfEmp** are significant at the 90% confidence level and both are estimated to decrease growth as they increase. Barro (1991) does provide evidence that government spending could decrease growth as it crowds out investment so this result is not unreasonable. The percentage of self-employed persons may have a negative or positive real effect, so there is little evidence to suggest that this result is incorrect. The underspecification of this model may be generating the bizarre results and the lack of significance for many of the variables. The model as a whole does test significant interestingly. Multicolinearity could be the culprit here, but further study and better data would be required to verify this.

A third model (Model 3) is specified without **Enrollment** and **SelfEmp** as a result of their low number of observations. This model is better described by random effects as the Hausman Test reveals in Table 6.

Table 6: Hausman Test Model 3

	Coefficients			
	Fixed	Random	Difference	Standard Error
Migrant	.8165584	.271566	.5449924	1.065941
Trade	.002329	.0065487	-.0042196	.1031061
CapForm	-.9133256	-.2564157	-.6569099	.4823125
Labor	-2.46e-06	-3.36e-07	-2.12e-06	2.31e-06
AgeDep	.027085	-.0975864	.1246714	.4476837
Govt	-.4368673	-.3832403	-.053627	.946787
FDI	-.1382508	-.1755408	.03729	.1488741
Unemp	1.160984	1.529982	-.368998	.6118526
	Test: Ho: Difference in coefficients not systematic (Random is appropriate)			
	Prob>chi2 (p-value) = 0.7017			

If underspecified Model 3 is barely so with 9 parameters being estimated and 86 observations. The results of Model 3 are similar to the results from Model 2 (Table 7). Only

Labor and Unemp are significant at the 95% confidence level and the labor force is estimated to have a negative effect on growth while the unemployment rate is estimated to have a positive effect on growth. No other parameters are significant at a reasonable confidence level. The results are again counterintuitive. And the model again tests significant, pointing to possible issues with multicollinearity causing some parameters to fail to register as significant.

Table 7: Model 3 Regression

Random-effects GLS regression		Number of Obs=86	Number of groups =28
R-sq: between = 0.4496			
Obs per group: Min = 1	Avg = 3.1 Max = 4		Wald chi2 (8) = 51.65
			Prob>Chi2 = 0.0000
Growth	Coefficient		Robust Std. Error
Migrant	.271566		.3103925
Trade	.0065487		.0519663
CapForm	-.2564157		.3892262
Labor	-3.36e-07*		1.26e-07
AgeDep	-.0975864		.3659653
Govt	-.3832403		.514954
FDI	-.1755408		.2416719
Unemp	1.529982*		.3374037
Constant	18.61633		26.27225
Note: * Denotes that coefficients are significant at the .05 level.			

CONCLUSION

All of the models specified in this paper have issues with possible omitted variables bias and multicollinearity stemming from the correlation between the stock of international migrants and the age dependency ratio since most migrants work, a similar correlation between the stock of international migrants and the unemployment rate, and the correlation between government spending and investment (capital formation and foreign direct investment) resulting from the crowding out effect.

These models and data issues affecting the reliability of results highlight why there is not an academic consensus on the issue. The EU was chosen due to the freedom of movement between member countries and the better access to its data compared to other less uniformly developed regions of the globe. Based on the results of Model 1, this policy of EU citizenship could have potentially hurt per capita growth in these countries at least during the years from 1990 to 2009. But it is possible that Model 1 estimates the relationship between per capita GDP growth and the stock of international migrants improperly. Model 2 and 3 offer no answer to the question of how the stock of international migrants affects growth either as the estimate is not significant. Unfortunately this paper provides no real answer as to the effect of a country's stock of international migrants as a percentage of its population on its per capita GDP growth. Further research in this area is then required to address the question and provide relevant motivation to policy makers with regard to migration policies. A note of caution on this approach is that it is possible that the effect immigration has on a country is country-specific and not a general rule even for a region as connected as the EU.

The competing nature of EU migration policy as a tool for promoting growth in its member states and the rise of anti-immigration political parties is a potential symptom of this

confusing and still unanswered question. The implication of the research on this topic is that

growth in the long run is promoted, but at the cost of higher unemployment, reduced wages, and

culture clash in the short run. This causes groups with a long run focus like the EU governing

body and groups with a more short run focus like individual member state governments and the

citizens therein to have differing viewpoints on the issue.

APPENDIX A: EUROPEAN UNION MEMBERS

Table 8: European Union Members

European Union Members

EU15 (1995)	EU27 (2007) [EU 15+]	EU28 (2013) [EU 27+Croatia]
Austria	Austria	Austria
Belgium	Belgium	Belgium
Denmark	Bulgaria	Bulgaria
Finland	Cyprus	Croatia
France	Czech Republic	Cyprus
Germany	Denmark	Czech Republic
Greece	Estonia	Denmark
Ireland	Finland	Estonia
Italy	France	Finland
Luxembourg	Germany	France
The Netherlands	Greece	Germany
Portugal	Hungary	Greece
Spain	Ireland	Hungary
Sweden	Italy	Ireland
The United Kingdom	Latvia	Italy
	Lithuania	Latvia
	Luxembourg	Lithuania
	Malta	Luxembourg
	The Netherlands	Malta
	Poland	The Netherlands
	Portugal	Poland
	Romania	Portugal
	Slovakia	Romania
	Slovenia	Slovakia
	Spain	Slovenia
	Sweden	Spain
	The United Kingdom	Sweden
		The United Kingdom

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APPENDIX B: VARIABLE SCATTERPLOTS

Figure 1: Growth vs. Migrant
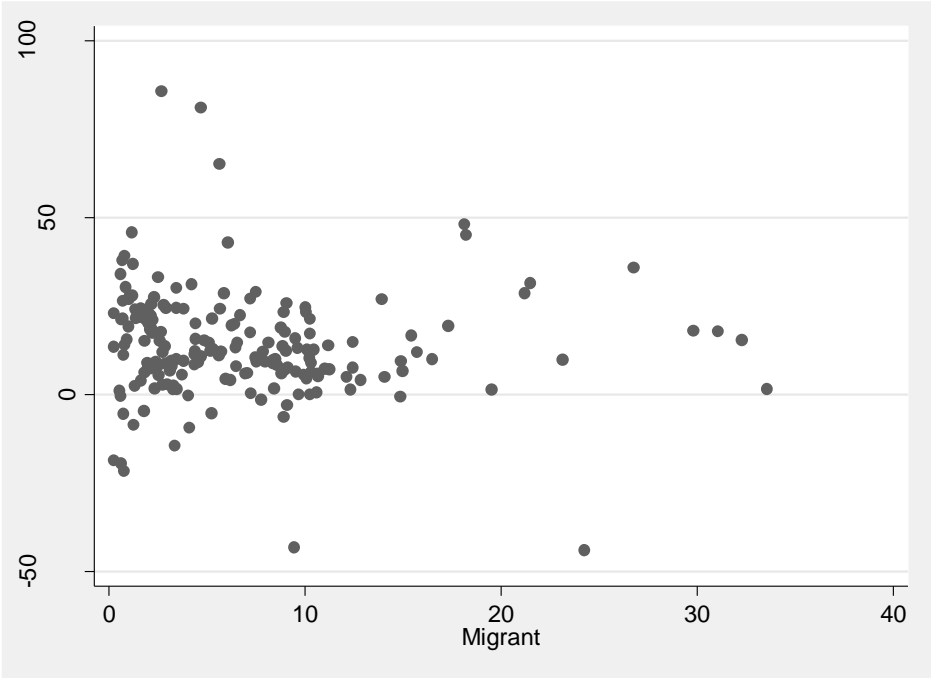
Figure 2: Growth vs. Trade
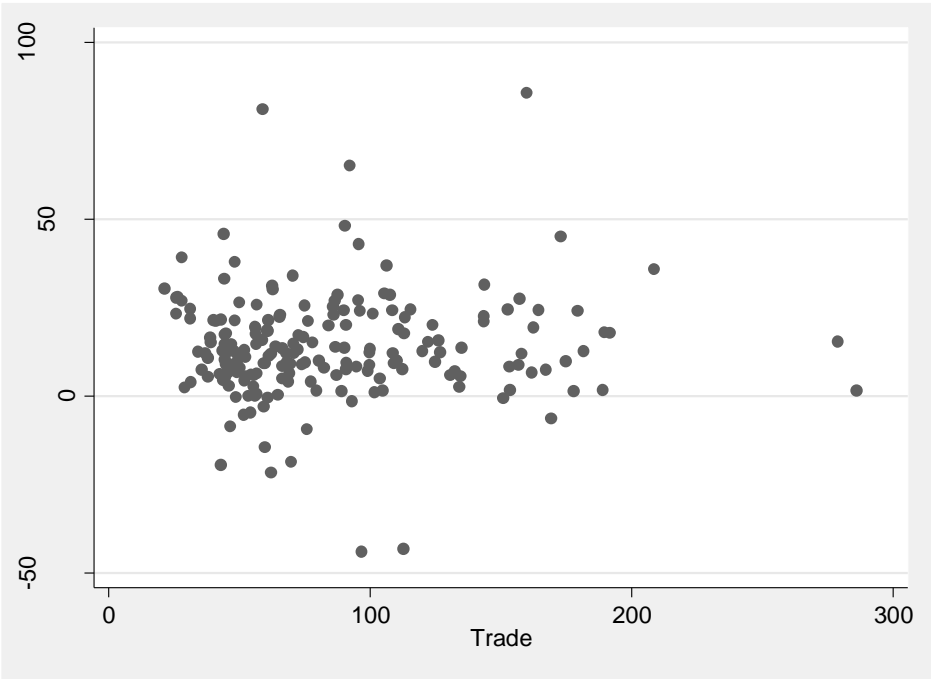
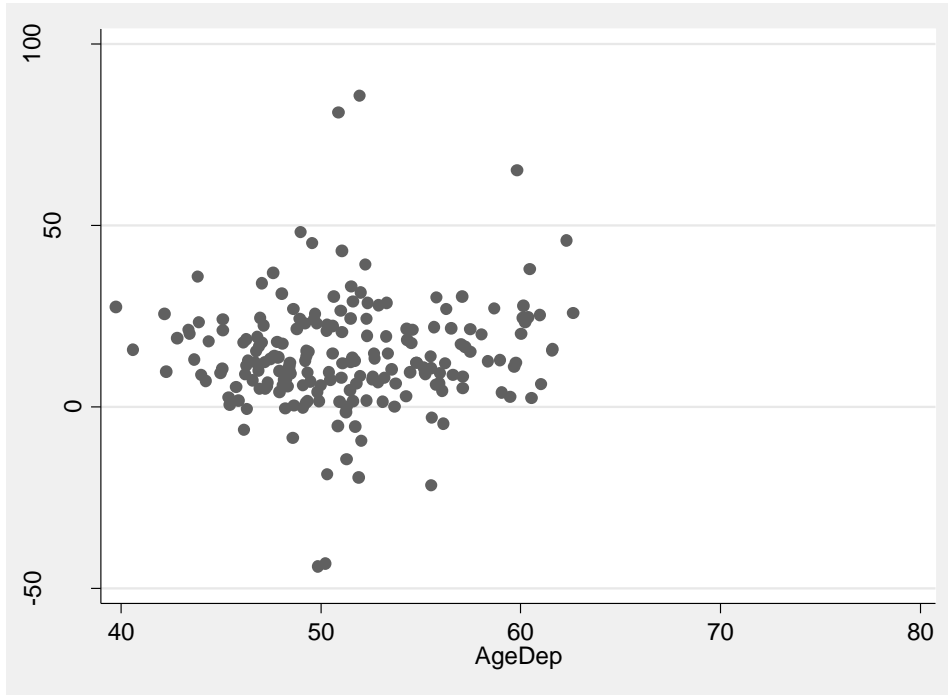**Figure 3: Growth vs. AgeDep**
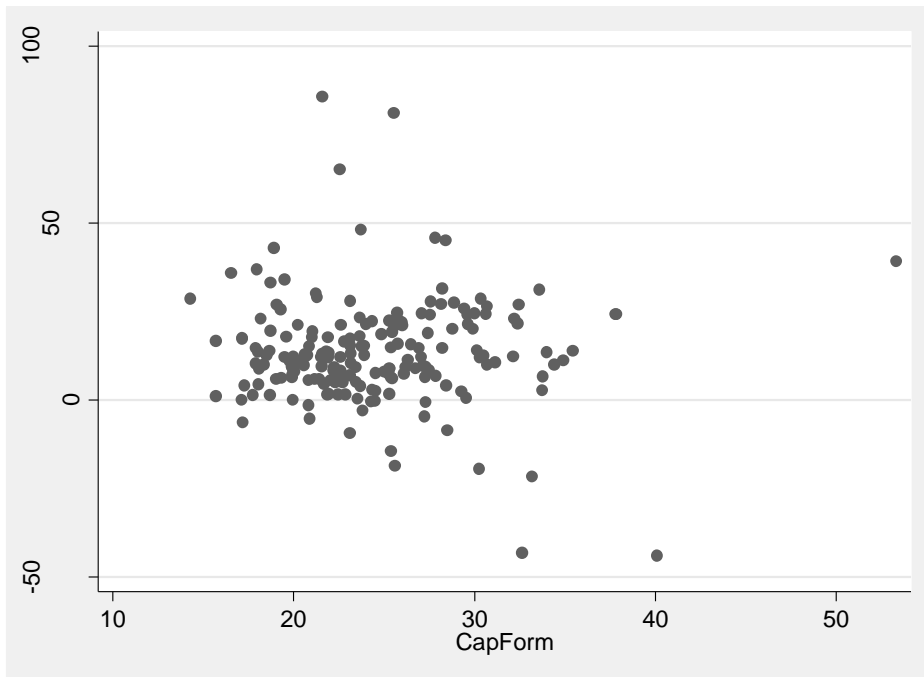

Figure 4: Growth vs. CapForm
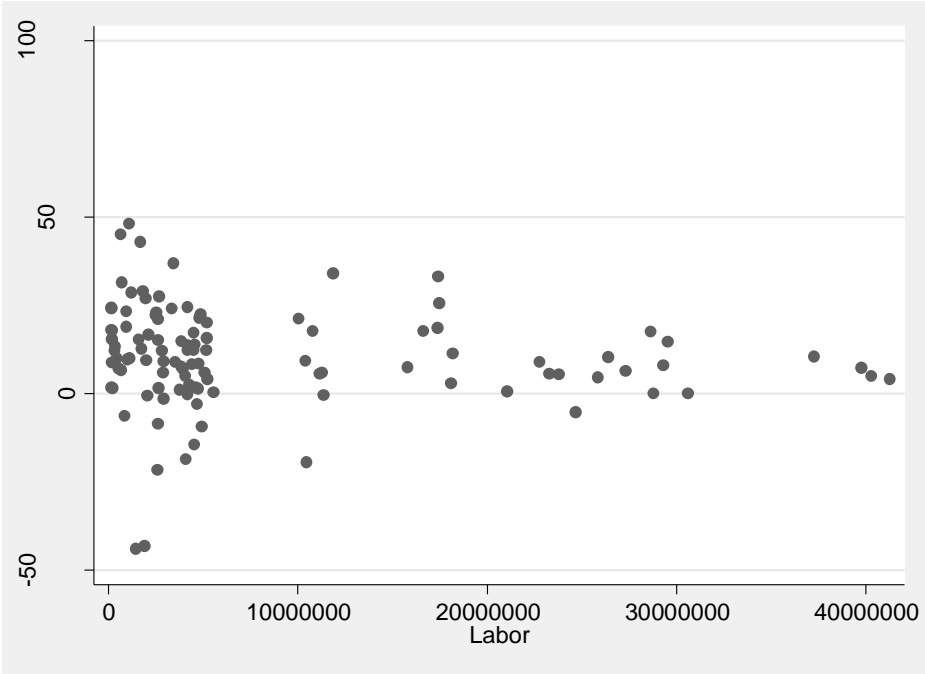
Figure 5: Growth vs. Labor
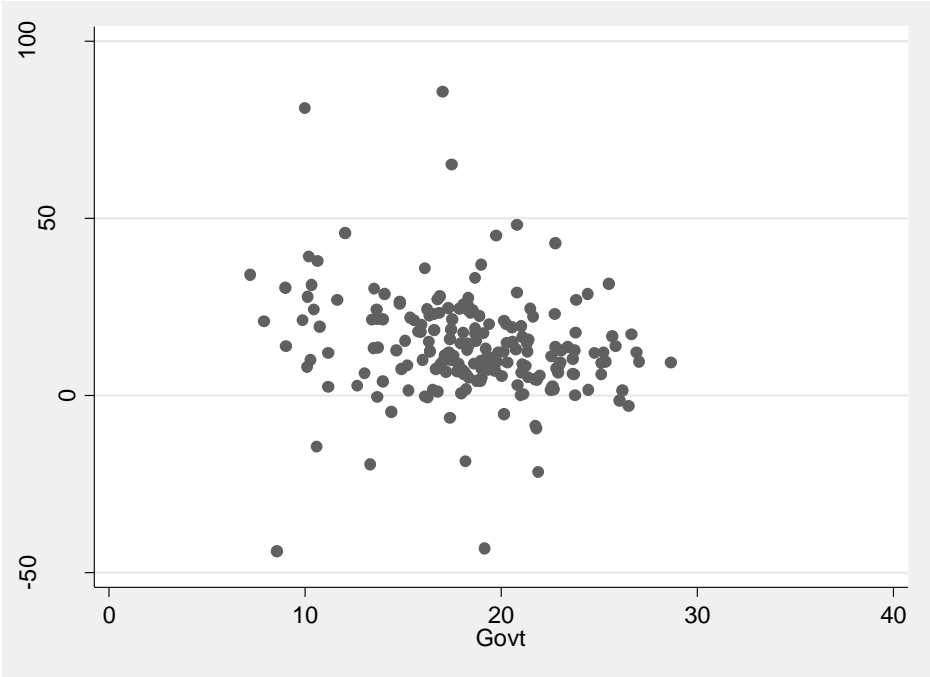

Figure 6: Growth vs. Govt
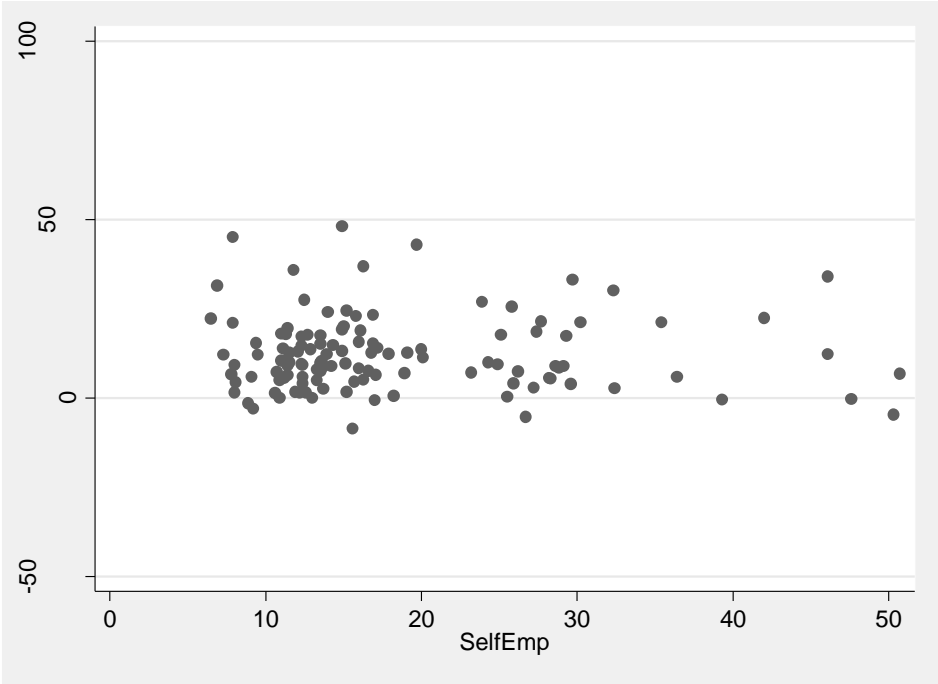
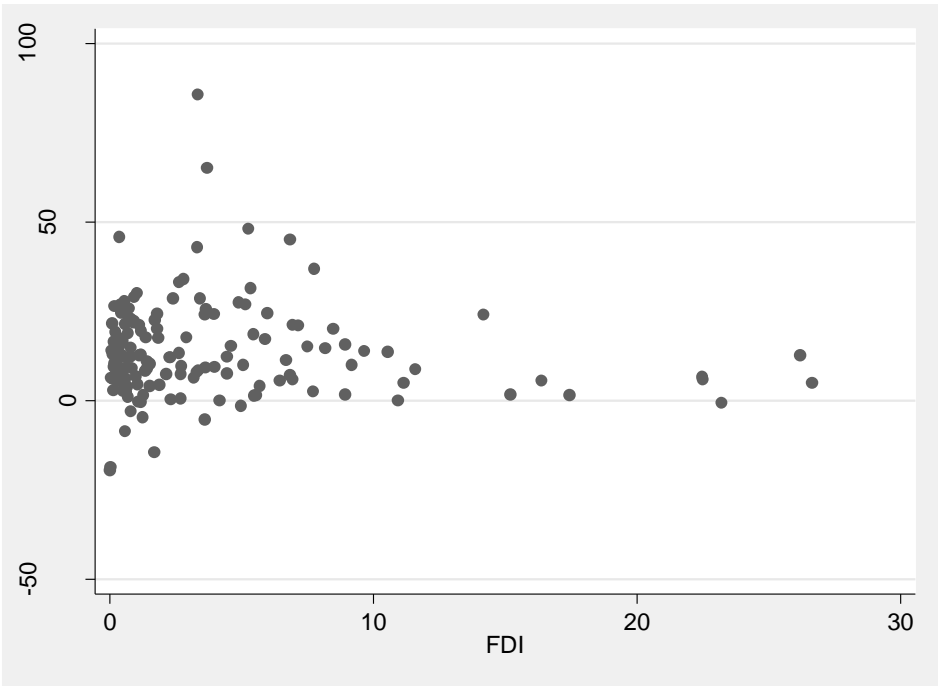**Figure 7: Growth vs. SelfEmp**

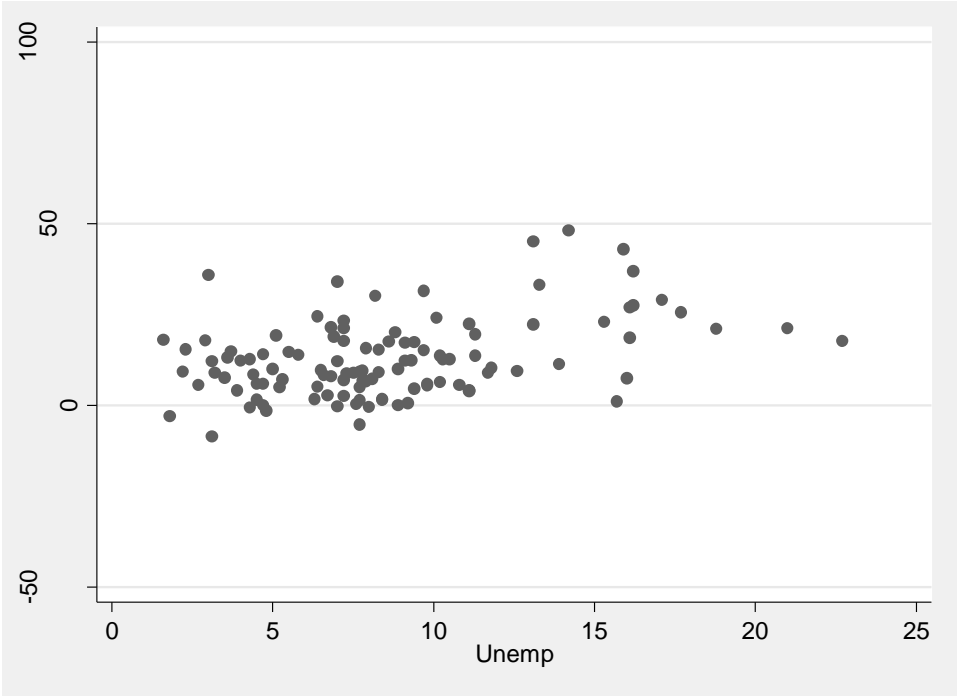**Figure 8: Growth vs. FDI**
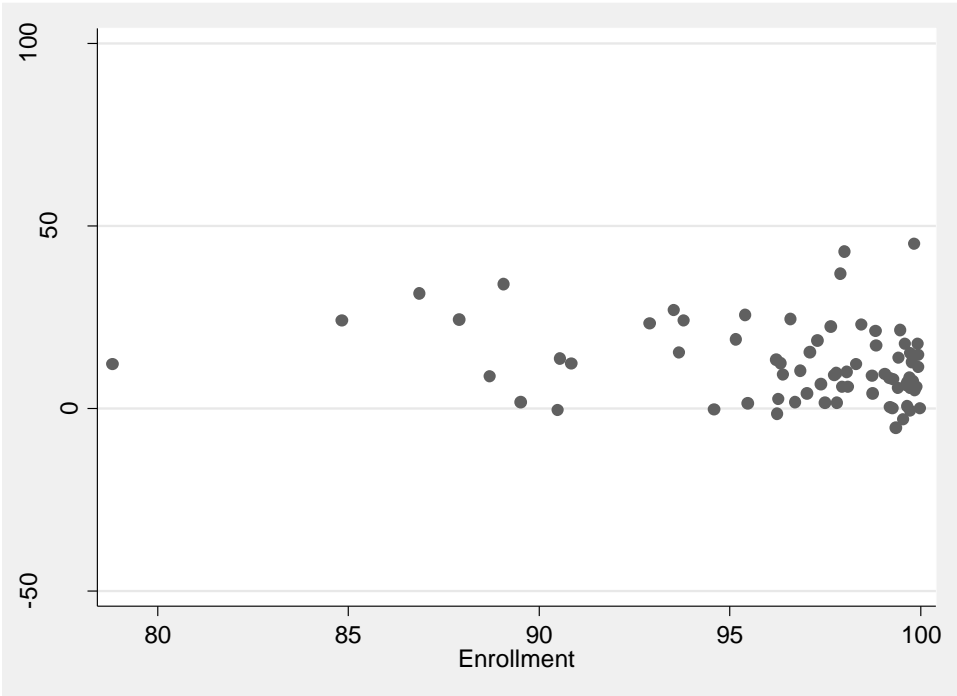
Figure 9: Growth vs. Unemp

Figure 10: Growth vs. Enrollment

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