The Economic Impact of EU Enlargement on Former Eastern Bloc Countries: A Quasi-Experimental Approach

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Abstract
This paper uses propensity score matching on observables to examine the economic impact of EU membership on the former Eastern Bloc countries that were a part of the 2004 EU enlargement: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. It then moves to a country-level analysis of Estonia using the synthetic control technique. The results are inconclusive, showing neither a consistently positive or negative treatment effect. This paper does not attempt to make a statement about whether or not EU membership was a good policy decision for these countries given alternative options, only to show that EU membership is not an economic panacea.
Membership in the European Union (EU) is often viewed as an unambiguously good decision for former Eastern Bloc countries. After the collapse of the Soviet Union, these countries were less developed than their Western peers, and the literature discussing their membership usually focuses on the costs of enlargement for existing EU member states. However, especially in light of financial crises in the last decade, there are significant risks and costs to former Eastern Bloc countries seeking membership. These costs include being impacted by the fiscal policy decisions of foreign countries and losing the power to freely conduct monetary policy. Therefore, a cost-benefit analysis of EU membership on former Eastern Bloc countries is necessary.

After the collapse of the USSR in 1991, former Soviet states and countries in the Eastern Bloc which were heavily aligned with the defeated superpower found themselves in turmoil. In addition to adjusting to new political structures and navigating international relations, the economic outlook in most, if not all, of these countries was bleak. During the Soviet period, there was a disproportionate emphasis on heavy industry, a lack of reliable production, and widespread resource waste due to misallocation and inefficiency. The Soviets also left a legacy of corruption, since bribery and black market activity were part of everyday life. In addition to dealing with the lingering effects of these business practices, much of the Eastern Bloc was left without a formalized monetary system or trade links. GDP crashed as inflation and unemployment soared, and the region found itself in economic upheaval.¹

One of the few bright points amidst this devastation was the opportunity for drastic political and economic reform, and the approaches Eastern Bloc countries took to economic reform were far ranging in ideology. Some countries, such as the Baltic states, embraced privatization and free market approaches, and others, such as Kazakhstan and Uzbekistan, favored more government intervention in the market and state ownership. Policy effectiveness varied greatly even between countries choosing very similar reform paths. For example, Estonia, Lithuania, and Bulgaria all used currency board arrangements, the strictest form of a fixed exchange rate regime in which the domestic currency is completely backed by reserves of a foreign anchor currency, but the three countries achieved different levels of success. This ambiguity of policy effectiveness is evidence of the necessity for country-level analysis in studying former Eastern Bloc countries. It also opens the door for debate on the best strategies for economic transition, and is what makes studying this region fascinating.

The literature on post-Soviet transition reforms is divided on nearly all issues, with some authors holding that reforms were too radical and others that they were too mild.\(^2\) One policy, however, has largely escaped the criticism of academics: alignment with Western Europe, particularly in the form of EU membership. Seeking EU membership is generally viewed as an unambiguously good decision for Eastern Bloc countries, and authors often work on this assumption without providing supporting evidence.\(^3\) Given the alternatives of isolationist policies or Eastern alignment at a time when the region was economically weak, it makes sense for advisors to champion


integration with more stable and wealthy Western markets. However, there is also the possibility of Western biases and lingering Cold War sentiment in leading academics.

Evidence for this possible bias comes from the support for Eastern Bloc countries’ decisions to seek membership in the EU, but a lack of focus on the fact that EU membership comes with costs. These costs include the loss of the ability to conduct monetary policy, subjection to foreign market fluctuations, and the possibility of being saddled with the consequences of free riders. As the 2008 economic crisis displays, these costs are not merely insignificant, theoretical possibilities. Eastern Bloc countries were hit harder than their Western counterparts due to their “particular model of development wedded to the internationalization of the financial sector and cheap credit,” and the fact that they did not benefit from the “large state-led bailouts seen in Western Europe and the United States.” Therefore, although existing EU members generally view new entrants as potential free riders, at least for former Eastern Bloc countries this has not been the case and the costs of EU membership may outweigh the benefits.

Despite this possibility, instead of focusing on the costs and benefits for the former Eastern Bloc countries themselves, papers on EU enlargement often focus solely on the potential harm that extending membership to these countries could cause the EU. These concerns stem from legitimate economic considerations, but also reflect negative views of Eastern Europe as a backwards region and a fear of immigration influxes. The European Union has always been a complicated entity since it includes nations who were

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historical enemies and lacks substantial political solidarity, and further diversifying the member pool could foreseeably increase tension. However, all entering countries are required to meet the Copenhagen Criteria for membership to prove themselves economically and democratically on par with existing members. Therefore any doubt about the abilities of countries that meet these criteria must reflect either a lack of faith in the criteria, a general belief that a smaller EU is more desirable, or simply prejudice against the countries applying for membership.

EU enlargement discussions aside, recently, some scholars have called into question the viability of the EU, and more precisely the European Monetary Union (EMU). The concerns most widely stated are fiscal free riding and a lack of control over monetary policy. Contributing to the questionability of the EMU are the opt-outs obtained by Denmark and the UK, as well as the UK’s continual consideration of exiting the EU. The ambiguity surrounding the question of whether or not EU membership has been beneficial for even the richest and most successful countries means that the policy decision of joining the EU should not be taken lightly or viewed as a cure for all economic troubles.

Evidence that EU membership does not necessarily lead to economic prosperity can be found in the varying levels of dedication new member states have to joining the EMU. All of the countries in the 2004 enlargement agreed to work towards adopting the euro after gaining EU membership, but the Baltic states, Slovakia, and Slovenia rushed ahead with their work to adopt the euro, while Poland, the Czech Republic, and Hungary

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6 Schimmelfennig, “EU Political Accession Conditionality,” 919-920.
seemed to lose their desire for EMU membership. These countries may simply be attempting to gain the benefits of EU membership without the restrictions of the euro, or they could be second-guessing their desire to integrate with the euro area in light of the financial crises.

Given that EU membership and deferral of EMU membership is an option (although certainly one not favored by the European Commission), examining the economic impact of EU membership itself becomes even more important. Former Eastern Bloc countries fought hard for their places as EU members, and their motives for doing so included increased economic prosperity along with political factors. We now turn our attention to an analysis of whether or not EU membership actually benefited the economic situations of former Eastern Bloc countries involved in the 2004 EU enlargement.

**Set Up**

In 2004, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia all became EU members in the largest single EU expansion in history. Of these states, Estonia, Latvia, and Lithuania are former Soviet republics; the Czech Republic, Hungary, Poland, and Slovakia are former Soviet satellites; and Slovenia is a former Yugoslav republic. I focus on these countries and employ propensity score matching to determine the treatment effect of EU membership for former Eastern Bloc countries.

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The dataset used includes 189 countries, and the data was taken from the World Bank Development Indicators, the International Monetary Fund World Economic Outlook, and the PolityIV Project. The data follows the convention of beginning in 1993 to avoid the fluctuations and unreliable data from the transition period after the collapse of the Soviet Union. I create a dummy variable for the treatment effect (a former Eastern Bloc country joining the EU in the 2004 enlargement) and use propensity score matching to calculate the probability of other countries (excluding EU members) joining the EU based on the right hand side variables. These variables are selected to match the factors that impact EU membership as laid out in the Copenhagen Criteria, which include three sections: political, economic, and institutional.

The political criteria for EU membership are, “Stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities.” To capture these effects I use PolityIV data, which measures “regime authority on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy).” Due to a lack of datasets measuring human rights or minority protection that are complete across the 189 countries in the dataset, PolityIV is the only variable measuring political criteria. The treated units all score 8 or above with an average of 9.5 on the PolityIV scale, and will therefore be matched with other high scoring countries. I assume that there is little variation in human rights and rule of law in these high scoring countries, and therefore believe that PolityIV captures the criteria I am looking for. I also

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include percentage of secondary school enrollment as a proxy for information access and ability to make informed decisions about government actions.

The economic criteria for EU membership are designed to ensure, “the existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union.”\(^\text{12}\) To measure this I include basic economic indicators such as real GDP per capita in current prices, GDP growth rate, GDP deflator, total investment as a percent of GDP, real interest rate, unemployment rate, and GINI coefficients. Based on Anders Aslund’s evaluation that total government expenditure and debt are some of the most important indicators of whether or not a country will end up in an economic crisis, I also include government expenditure and debt as a percent of GDP.\(^\text{13}\) Research and development as a percent of GDP is included to capture the expenditure on promoting growth as well as its outcome (GDP growth rate). In addition, I include the percentage change in volume of imports and exports to match on trade openness and foreign interaction.

Finally, the institutional requirement for EU membership is, “the ability to take on the obligations of membership including adherence to the aims of political, economic and monetary union.”\(^\text{14}\) I assume that the variables already included are sufficient for measuring this ability.

Matching Results

To determine the treatment effect of former Eastern Bloc countries joining the EU in 2004, I first match on the variables listed above to determine the propensity score of receiving the treatment for each country in my dataset. I do this for the outcome variables of GDP growth rate, GINI coefficients, GDP deflator, and unemployment. I employ two types of matching for each outcome variable: nearest neighbor and kernel. Nearest neighbor simply matches the closest propensity scores, and kernel matching uses a continuously distributed Gaussian function to match countries based on weighted averages of the control countries’ outcome variables.

I leave out the variables for Polity IV and government debt because, due to a lack of data, including them causes four treated countries to be dropped when using common support. This is worrisome because some of the countries my treated units are matched with, such as Belarus, are known for human rights violations and would perhaps not be selected as matches if Polity IV were included. Also problematic is the fact that in some of the trials Belarus is the match for up to half of my treated countries. To deal with this issue I use matching without replacement as a robustness check.

My results suggest that the effect of EU membership on former Eastern Bloc countries is ambiguous. The estimated treatment effects are negative for GDP growth rate, negative for GDP deflator, and positive for unemployment. The impact on GINI coefficients is unclear. I now show the details of all matching trials for each of the outcome variables.

I first use nearest neighbor matching with the outcome GDP growth rate (App. Table 1). In this case, the Czech Republic is matched with Belarus, Estonia with Ukraine,
Hungary with Belarus, Latvia with Belarus, Lithuania with Serbia, Poland with Serbia, Slovakia with Belarus, and Slovenia with Belarus. The covariate balance between the matched and unmatched countries can be found in Table 2 of the appendix. The only variables for which there is cause for concern are those that have significant p values at the 5% level before matching, but which are insignificant after matching. In this case, these variables are total expenditure, exports, and education.

In this trial, the treatment effect of EU membership is calculated as a -0.801% impact on GDP growth rate. This seems like an overestimated effect, part of which is likely due to the fact that replacement is allowed. However, performing the matching technique without replacement leads to half of the treated countries being dropped due to common support (App. Table 4). Additionally, the change in the estimated treatment effect is small, and it becomes -0.737%. I also eliminate the variables with undesirable covariate balance listed above (total expenditure, exports, and education), and calculate the treatment effect to be -6.203% (App. Table 3). This is extremely high, and most likely inaccurate. This is problematic because it suggests that the dropped variables are important for determining the outcome variable.

For more robustness checks I run the same trial using kernel matching and find an estimated treatment effect of -1.186% (Table 6). One disappointing aspect of both these matching methods is that they estimate the treatment effect only for GDP growth in 2004 instead of over a longer period. As further exploration, I calculate the average change in GDP per capita of all treated countries over the period 2004-2010 (the year before the first of these countries, Estonia, adopted the euro) to get 0.681%. I then perform the same calculation on the matched countries to get 1.052%, for a difference of -0.371%.
These methods yield varying results, but all are negative values. Therefore, based on these estimations, joining the EU is connected with a decrease in real GDP growth rate. Removing the outlier of -6.203, the mean treatment effect from these trials is -0.774 with a standard deviation of 0.334. These results are interesting because they suggest that EU membership leads to lower growth rate, which is counterintuitive since many former Eastern Bloc countries sought EU membership as a way to bolster their economies.

### GDP Growth Rate Estimated Treatment Effects

<table>
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<tr>
<th>Method</th>
<th>Treatment Effect</th>
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<tbody>
<tr>
<td>Nearest Neighbor</td>
<td>-0.801</td>
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<tr>
<td>Nearest Neighbor (without replacement)</td>
<td>-0.737</td>
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<tr>
<td>Nearest Neighbor (better covariate balance)</td>
<td>-6.203</td>
</tr>
<tr>
<td>Kernel</td>
<td>-1.186</td>
</tr>
<tr>
<td>Percentage Change Calculation</td>
<td>-0.371</td>
</tr>
<tr>
<td>Mean Treatment Effect (excluding outlier)</td>
<td>-0.774</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.334</td>
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</tbody>
</table>

Performing the same series of matching techniques using GINI coefficients as the outcome yields results that are both positive and negative. The estimated treatment effects are 1.315 from nearest neighbor with replacement, 0.519 from nearest neighbor without replacement, and -1.697 from kernel matching (App. Tables 8, 10, 12). Contributing to this wide variance is missing data for the GINI coefficient, with only 910 total observations out of 4,158 possible (App. Summary Statistics). Even so, these results are interesting because they show that the relationship between EU membership and income inequality for former Eastern Bloc countries is unclear.
GINI Coefficient Estimated Treatment Effects

<table>
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<tr>
<th>Method</th>
<th>Treatment Effect</th>
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<tbody>
<tr>
<td>Nearest Neighbor</td>
<td>1.315</td>
</tr>
<tr>
<td>Nearest Neighbor (without replacement)</td>
<td>0.519</td>
</tr>
<tr>
<td>Kernel</td>
<td>-1.697</td>
</tr>
<tr>
<td>Mean Treatment Effect</td>
<td>0.046</td>
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<tr>
<td>Standard Deviation</td>
<td>1.274</td>
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</table>

The results for the treatment effect on GDP deflator are all negative, suggesting that EU membership has the effect of decreasing inflation (App. Tables 14, 16, 18). These negative values make sense, since, in theory, integration into the combined European market should have stabilizing effects for the new members. The calculated treatment effects are fairly wide ranging, so it is difficult to describe an exact treatment effect, but the fact that all trials yielded results with the same sign is informative.

GDP Deflator Estimated Treatment Effects

<table>
<thead>
<tr>
<th>Method</th>
<th>Treatment Effect</th>
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</thead>
<tbody>
<tr>
<td>Nearest Neighbor</td>
<td>-319.987</td>
</tr>
<tr>
<td>Nearest Neighbor (without replacement)</td>
<td>-162.936</td>
</tr>
<tr>
<td>Kernel</td>
<td>-138.416</td>
</tr>
<tr>
<td>Mean Treatment Effect</td>
<td>-207.113</td>
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<tr>
<td>Standard Deviation</td>
<td>98.518</td>
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</tbody>
</table>

The estimated treatment effect for unemployment rate is similar to that for the GDP deflator in that it maintains the same sign for all versions of matching (App. Tables 20, 21, 22). All of the results are positive, suggesting that EU membership increases unemployment. This is interesting since the increased worker mobility caused by free movement between other EU countries should decrease unemployment. This finding is, however, in line with the result that EU membership has a negative impact on GDP growth, since GDP growth and unemployment rate are positively correlated.
In summary, according to the results of this matching study, EU membership is related to a lower GDP growth rate, lower inflation, and higher unemployment. The impact on income inequality is unclear. Therefore, the effects of EU membership on Eastern Bloc countries are inconclusive. Part of this ambiguity could be the fact that the pool of treated countries is rather small, which is not ideal for the matching technique. Additionally, each of these countries had unique transition experiences after the collapse of the USSR, levels of commitment to EU membership, approaches to gaining such membership, and convergence with EU standards at the time of membership (Frenkel and Nickel 64). As such, I implement a country-level analysis of Estonia using the synthetic control technique.

**Synthetic Control Results**

I use the synthetic control technique to create a counterfactual Estonia from a composite of other countries to estimate what would have happened if Estonia had not joined the EU. The outcome studied here is GDP per capita, so to construct a synthetic Estonia I select the variables most influential in predicting GDP per capita. I use GDP per capita in three lag years, investment, exports, imports, and PolityIV. I again follow the convention of not using data from before 1993, so my pretreatment period is 1993-2004,
and the dataset ends in 2010 when Estonia adopted the euro. My dataset includes all countries for which the World Bank and IMF both have data, and I remove all 25 EU members (aside from Estonia) because these countries have received the treatment of EU membership.

I am concerned about spillover effects, but mostly in countries that are geographically close to Europe and conduct the most trade with EU member states. However, I keep European countries that are not EU members in the set because Estonia itself is in Europe and would also have benefitted from EU spillover effects had it not earned membership. The potential confounding events that happened to Estonia during the time period studied are the 1998 Russian financial crisis and the adoption of policies to meet Copenhagen Criteria. Although the financial crisis was severe, Estonia recovered fairly quickly, so I am less worried about this impact. Additionally, the adoption of policies to meet Copenhagen Criteria was done with the intent of gaining EU membership, so I am not particularly concerned about the impacts of such policies since they are still related to EU membership.

The synthetic Estonia comes out to be 54.7% Equatorial Guinea, 41.0% Suriname, and 4.3% Norway (App. Table 26). The predictor balance between real and synthetic Estonia leave something to be desired, especially the polity score. Real Estonia’s polity score is 7.182, but synthetic Estonia’s is -0.255 (App. Table 26). Additionally, when graphed, there is no noticeable break in the lines showing real Estonia and synthetic Estonia’s GDP per capita. If EU membership had an impact on GDP, we would expect there to be a difference in the two lines beginning around 2004 when
Estonia joined the EU. Because there is no such break, we can infer that this technique shows no treatment effect.

**Synthetic Estonia**

To verify that there is really is no treatment effect I run a placebo test, which acts as if every country in the donor pool were the treated country. If there were a treatment effect, I would expect the line graphing Estonia to be an outlier. As it is, Estonia is in the middle of the sample of placebos and we can be reasonably sure of our assertion that there is no noticeable treatment effect.
Although there are no discernable treatment effect in this synthetic control trial, the countries that make up synthetic Estonia could give weight to the argument that the 2004 EU enlargement encompassed countries that were not truly on par with Western Europe in terms of economic development. One would assume that simply implementing policies to meet the Copenhagen Criteria would have positive effects on growth and cause a treatment effect, so the fact that none is observed here even after membership calls into question the appropriateness of the criteria for determining development. Aside from the small percentage of Norway, synthetic Estonia is composed mostly of developing countries. Therefore, the European Commission could have been too lax in allowing the former Eastern Bloc countries to enter the EU, especially when taking into consideration the fact that Estonia is one of the most successful post-Soviet states.

That being said, it is important to note that the fit of the synthetic control created here is far from perfect. The percentage root mean squared error is a measure of the distance between the two lines in the pretreatment period, and for this trial it is calculated...
as 488.792. Given that the mean of real GDP per capita in 2004 was 5726.506, this shows that the difference between the outcomes of the synthetic and real Estonia’s in the pretreatment period is around 8.537%.

I do not attempt to change my pool of donor countries since one of the factors that I am concerned with is a lack of suitable matches for Estonia outside of Europe, but I do change the predictor variables as a robustness test. I keep real GDP per capita as the outcome variable, but change the input variables to GDP growth rate, interest rate, exports, and imports. The predictor balance in this case is very close for all variables, and the synthetic is made up of small percentages of 95 countries instead of large percentages of just a few as in the previous example (App. Table 28). The percentage root mean squared error, however, increased to 1561.873. For this trial there is again no discernable break in the treated and untreated lines, and therefore there is no definite treatment effect.

**Synthetic Estonia Robustness Check**

![Graph showing synthetic vs treated data](image)
Discussion

Although the results from these techniques are inconclusive, they still provide insight into the costs and benefits of EU membership. Becoming an EU member is no small feat, and former Eastern Bloc countries must work hard to meet the demanding membership criteria. The fact that the economic payoffs are potentially negligible is counterintuitive and suggests that these countries either did not benefit from membership in the ways they thought they would, or that they value the political elements of EU membership over the economic. In any case, the implications for the strength of the EU and its ability to improve the economic outlooks of its member states should be analyzed for both long-standing members and newer entrants. Further work should build on country-level analysis of the economic impacts of EU membership, as well as the impact of adopting the euro.
Bibliography


