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The benefits of 25 years of EU membership

In 2020, a quarter of a century has passed since Finland along with Sweden and Austria joined the European Union. While perceived economic benefits were only one of the reasons to join, and arguably less important in the case of Finland than political factors, it is obviously of great interest to assess to what extent the membership has been economically beneficial. While economic theory suggests that such an integration boosts economic growth and welfare through several channels, making an empirical assessment of the magnitude is far from easy.

The fundamental problem is that it is hard to define the counterfactual, i.e. what would have happened in the absence of the membership. Eichengreen and Boltho (2008) discuss extensively different phases of European integration precisely from this point of view. A key point in their analysis is that many of the effects of different steps of integration – e. g. the European Payments Union to the Common Market, the Single Market Programme and ultimately the Economic and Monetary Union – could have materialised through alternative arrangements. In the case of the three countries joining the EU in 1995, an obvious alternative had been the European Economic Area (EEA), which provides essentially the same access to the internal market as the membership but without political influence and a degree of solidarity that arguably comes with being part of the same "club".

In both cases, full membership and remaining as a silent partner in the EEA, the question remains about the size of the benefits of such an economic integration. While there are many studies about the impacts of European economic integration, the results vary a great deal. Eichengreen and Boltho consider 5% higher GDP per capita a sort of ball park benefit of European integration on average, while Badinger finds even as high as 20% benefits.

In a recent paper, Campos, Coricelli and Moretti/CCM (2019) analyse systematically the impacts of all EU enlargement rounds on joining countries' GDP per capita using what has become to be called synthetic control method. Their conclusion is quite positive: The joining countries' GDP per capita is about 10% higher 10 years after the entry (and somewhat more beyond that time span) than had been without the economic integration.

For the three 1995 accession countries, the benefits CCM arrive at are somewhat less after 10 years in their preferred specification: Finland 4%, Sweden 2.3% and Austria 6.3%. Some alternative specifications suggest considerably higher benefits for Finland (up to 12%) while the benefit for Austria comes out smaller and rather unstable for Sweden.

In this paper, we expand the CCM analysis for the three 1995 accession countries by including 9 more years in the sample, i.e. covering also the years 2009 to 2017. CCM terminate their analysis in 2008 on the argument "to avoid confounding effects from the global financial crisis (GFC)". While there obviously is a risk that the GFC affected the countries in question differently from the "donor pool" countries and thus including the period may bias the results, while leaving these years out is also problematic. It restricts the analysis to a period of relatively rapid growth in the EU. This high growth period turned out unsustainable, being based on debt-financed consumption and in many times unprofitable investments. Excluding years with more adverse external conditions, plagued by the euro crisis, might therefore lead to biased results as well. While we do our

analysis for the three countries, our main focus is on Finland.

Our basic finding is that the benefits of integration do not disappear in the post-GFC years, although they appear somewhat smaller than in the pre-GFC period.

1 The approach

We assess the potential benefits of the EU membership of Finland, Sweden and Austria on the basis of the real GDP per capita and real GDP per employed as a broad measure of labour productivity. The time period considered is from the year of the accession 1995 to 2017.

The analysis uses the so-called synthetic control method (SCM), developed by Abadie and Gardeazabal (2003) and Abadie et al. (2010, 2015), in which a counterfactual is constructed to estimate the effect of the EU accession to the countries of interest. The counterfactual is constructed by using data from periods prior to the treatment period, which in our case is the year of EU enlargement, that is 1995. The data consists of dependent variable and predictive variables from the country of interest and from the countries in the donor pool. The dependent variables in our analysis are the real GDP per capita and real GDP per employed, for which separate counterfactuals are constructed.

The counterfactual – that is the synthetic control unit – is constructed as a weighted average of the countries in the donor pool. The weights are chosen according to a solution of a nested optimization problem in order to minimise the mean squared difference between the dependent variable of the counterfactual and that of the country of interest prior to treatment period, but also to minimise the difference between the predictors. Most importantly, the dependent variable is time series, whereas the predictors are means, or other statistics, from periods prior to the treatment period. The role of the predictors is to ensure that the counterfactual resembles the country of interest not only in the dependent variable, but in other relevant aspects as well. This prevents over-fitting and makes for more reliable and robust results.

After construction of the counterfactual, the estimated dynamic effect of the treatment (EU accession) to the dependent variable (real GDP per capita and real GDP per employed) is simply the difference between the realised value of the dependent variable and that of the counterfactual in the post-treatment periods. More technical exposition of the synthetic control method and the estimation algorithm is available in Abadie and Gardeazabal (2003) and Abadie et al. (2010, 2015).

We follow very closely the choices made by CCM in order to make the results comparable. In particular, the additional predictors are the same ones as in CCM. They include thus in addition to the GDP, the pre-1995 means of (i) investment share of GDP per capita, (ii) population growth, (iii) share of agriculture in value added, (iv) share of industry in value added, (v) secondary gross school enrolment and (vi) tertiary gross school enrolment. For some countries in the donor pool, the values of some of the predictors are not available for all the periods from 1970 to 1994 otherwise used in the estimation of the synthetic control and as in CCM, in those cases the means of only available values are used.

The donor pool consists of non-EU countries and plausibly not affected by the EU enlargement. The full donor pool used in the analysis can be read from tables 1 and 2. The tables also display the estimated country weights for our baseline models, using the full

Table 1

Weights for baseline synthetic control units with real GDP per capita as the dependent variable

	Austria	Finland	Sweden
Argentina	0	0	0
Australia	0.26	0.77	0.39
Switzerland	0	0	0
Chile	0	0	0
China	0	0	0
Colombia	0	0	0
Egypt	0	0	0
Indonesia	0	0	0
Republic of Korea	0	0	0
Morocco	0	0	0.16
Mexico	0	0	0.08
Malaysia	0	0	0
New Zealand	0.31	0	0
Philippines	0.33	0	0.36
Thailand	0	0	0
Tunisia	0	0	0
Turkey	0	0	0
Uruguay	0.1	0.23	0

Source: Authors' compilation.

Table 2

Weights for baseline synthetic control units with real GDP per worker as the dependent variable

	Austria	Finland	Sweden
Argentina	0.04	0	0
Australia	0.27	0.66	0.1
Switzerland	0	0	0
Chile	0	0	0
China	0	0	0
Colombia	0	0	0
Egypt	0	0	0
Indonesia	0	0	0
Republic of Korea	0	0	0
Morocco	0	0	0
Mexico	0	0	0.57
Malaysia	0	0	0
New Zealand	0.28	0.34	0.05
Philippines	0.37	0	0.27
Thailand	0	0	0
Tunisia	0	0	0
Turkey	0	0	0
Uruguay	0.01	0	0

Source: Authors' compilation.

donor pool of countries for which there was sufficient data available.

2 The results

The results of the analysis are summarised in table 3. Three observations stand out. First, the benefits of the EU membership in terms of GDP per capita extend to post-GFC years. Second, the suggested benefits are somewhat lower in this latter period than in the earlier years for all countries. Third, the gains in labour productivity from EU membership appear large compared to the GDP per capita gains. As a whole, the results for the period up to 2008 are – as they should be – very similar to those obtained by CCM.

The overall level of estimated effects in our analysis appears to be slightly higher than in CCM. The small differences are not surprising, given a slightly different donor pool, and consequently in some cases very different composition of countries with a positive weight in the baseline synthetic control unit. The fact that we have obtained very similar results to those in CCM despite the differences in composition of the donor pool and synthetic control units is however reassuring. Most notably, Japan, Iceland and Canada are all discarded from the donor pool in our analysis due to insufficiencies in the data of predictive variables we were able to collect. In all of the baseline synthetic control units in CCM for Austria, Finland and Sweden, at least one of those countries had a significant positive weight.

The only estimated effect that differs considerably from the baseline results in CCM is the effect on labour productivity of Sweden. Our estimate of over 13% on average for the period from 1995 to 2008 is much higher than the about 3% effect implied by the baseline results in CCM. The sensitivity analysis in CCM however suggests the

results to be highly sensitive to the choice of countries in the donor pool and the probable effect to be much higher than implied by the baseline results. Our estimate of a larger effect is also well supported by our sensitivity analysis in the next section.

Overall, the uncertainties around the estimates of the exact effects are large, as well illustrated by the sensitivity analysis in CCM. Qualitatively, everything however suggests the effect of the EU accession to have been clearly positive for all Austria, Finland and Sweden, even after the onset of the GFC.

The estimate of some 5% GDP per capita benefit of the EU membership by 2017 is somewhat less than 10% of the GDP per capita growth of Finland (53% in all between 1994 and 2017) and Sweden (58%). However, for Austria, the membership gain appears to be much higher: The almost 10% benefit is almost a quarter of the overall change in GDP per capita (39%) in the same period.

A more nuanced picture emerges from the evolutions of the counterfactual and actual GDP per capita and GDP per employed shown in chart 1. The dashed line depicts the constructed baseline synthetic control, whereas the solid line is the actually observed dependent variable. The vertical dotted line marks the time of the EU enlargement and the first period not used for construction of the synthetic control. The vertical dashed line marks the spot for the financial crisis of 2008.

Austria's economic growth performance is more stable than that of the two Nordics. At the same time, the benefits as measured by the discrepancy of the two lines are rather steady. Sweden and Finland display considerably more volatile GDP growth patterns, and also the discrepancy of the actual and counterfactual is more variable over time.

In the case of Finland, the actual GDP per capita fails to exceed the counterfactual in two episodes. In the first years after the accession, GDP per capita remained below the counterfactual reflecting the deep recession of the economy into which Finland has entered a few years earlier. More interestingly, towards the end of the sample period 2013–2017 the actual and counterfactual GDP per capita lines almost coincide.

Finland's growth performance since the accession was affected greatly by the evolution of the ICT sector led by Nokia. While EU membership probably helped the Finnish ICT production, its phenomenal growth in the second half was mostly unrelated to EU integration. Given that Nokia's contribution to Finland's GDP reached 4% at its peak, it is likely that the discrepancy between the actual and counterfactual overstates the benefits of the EU membership prior to the GFC.

Table 3

Average percentage deviations from the counterfactual

	GDP per capita			Labour productivity		
	1995-2017	1995-2008	2009-2017	1995-2017	1995-2008	2009-2017
Austria	9.71	10.86	7.93	13.8	14.77	12.3
Finland	4.82	5.33	4.04	6.64	6.7	6.54
Sweden	4.92	6.12	3.06	13.68	12.95	14.8

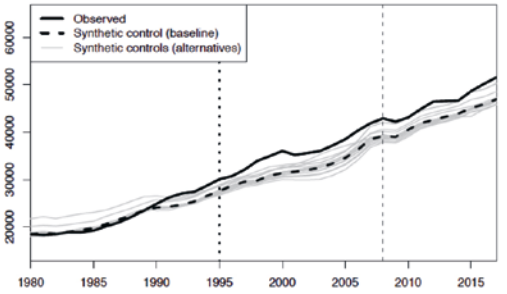
Source: Authors' compilation.

Chart 1

The evolution of the true (observed) and counterfactual (synthetic control) GDP per capita and GDP per employed

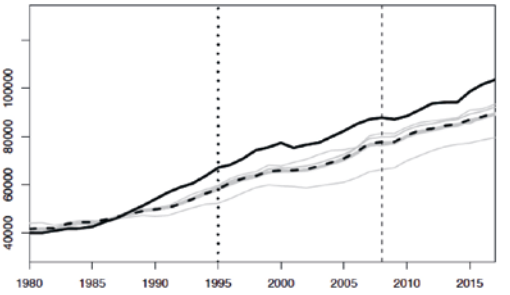
Austria – GDP per capita

Real GDP per capita



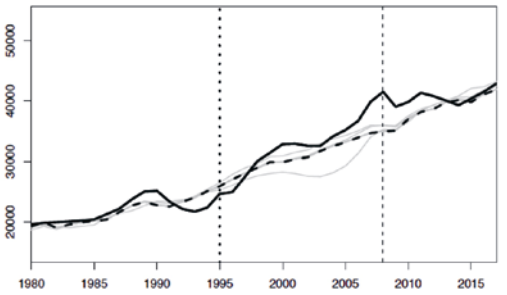
Austria – Labour productivity

Real GDP per worker



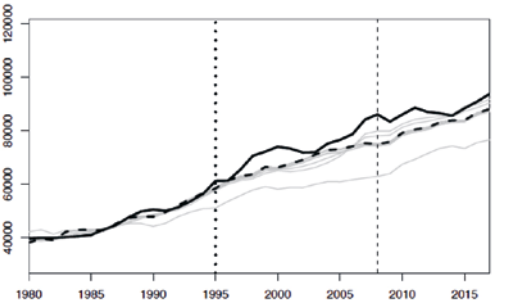
Finland – GDP per capita

Real GDP per capita



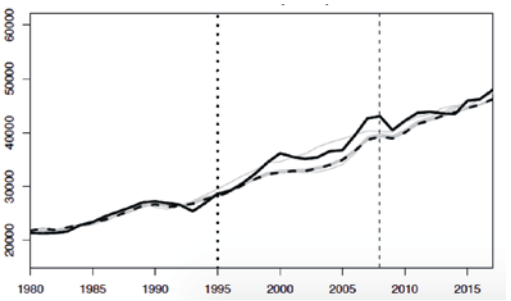
Finland – Labour productivity

Real GDP per worker



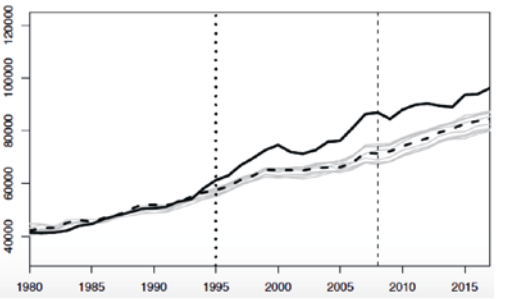
Sweden – GDP per capita

Real GDP per capita



Sweden – Labour productivity

Real GDP per worker



Source: Authors' compilation.

On the other hand, following the GFC, the Finnish economy was not hit badly only by the global and subsequent euro area crisis, but also by the decline of Nokia's cell phone business. About half of the GDP decline between 2008 and 2015 was due to the ICT sector dominated by Nokia (Kaitila et al., 2018). Given that this loss of high value-added production implied overall decline of productivity, it is noteworthy that this factor was not enough to eliminate the productivity gains attached in the synthetic control exercise to EU membership. As Nokia's decline had nothing to do with the EU membership, one could argue that productivity benefits suggested by the analysis work as a lower bound for the true ones.

The fact that GDP per capita gains from EU membership disappear in our analysis in the last years while the

productivity gains remain clearly positive implies that labour input has developed badly relative to the counterfactual in this period. Two explanations appear plausible. One is a secular decline in the working age (15 – 64 years of age) population, which started in 2010. The second is the loss of cost competitiveness, which had a negative impact on labour demand. Unlike the first one, this second explanation may be linked to EU integration in the sense that the deep recession that started in 2008 was the first such episode while Finland was part of the monetary union. It might be argued that the Finnish labour market institutions had not adjusted to the new integration-induced monetary regime.

3 Robustness

The synthetic control method is in an obvious way vulnerable to the choice of countries in the donor pool. It is therefore useful to check how much the results would change if the donor pool was changed. We do this by the so-called leave-one-out validation. The synthetic control is re-estimated multiple times, each time leaving a different country out of the donor pool. This way the sensitivity of the results can be assessed, since if the results significantly differ after the deletion of one country from the donor pool, the difference should be interpreted as stemming from idiosyncratic shocks in this individual country alone and not from the difference in the true counterfactual and the dependent variable.

The results of the robustness checks are presented in chart 1 with grey lines. With regard to GDP per capita, the results for Austria seem quite robust, since all the alternative counterfactuals (grey lines) are in close proximity of the baseline model. With Finland, however, the deletion of Australia would seem to widen the gap between the realised values and the counterfactual (at least before the financial crisis), supporting the interpretation of the results as a lower bound of the effect of EU accession.

With Sweden, the deletion of Philippines would seem to make the realised value of GDP per capita and the counterfactual not to significantly differ from each other. This suggests that the evidence on the effect of the EU membership on the real GDP per capita of Sweden is relatively weak, since the results of the baseline model seem to be mainly driven by Philippines alone. Similar observations were made in CCM regarding the robustness of the results for GDP per capita of Sweden.

However, little surprisingly, the counterfactual for labour productivity in Sweden seems much more robust, as well as indicating larger percentage effects even before the robustness checks. For Finland the results for labour productivity seem robust apart from the deletion of New Zealand, implying yet again a possibility for even larger effect than estimated. For Austria, the results for labour productivity do not seem quite as robust as they did for GDP per capita. Again, the deletion of New Zealand causes the estimate of the gap between the realised value and the counterfactual to widen significantly. This suggests, as in the case of Finland, that the baseline estimate of the effect of the EU accession on labour productivity of Austria is a lower bound of the true effect.

4 Conclusions

Our simple synthetic control analysis of the GDP per capita and labour productivity suggests that EU membership has indeed been economically advantageous for Finland as well as the two other 1995 accession countries, confirming

the earlier results of a similar analysis with a shorter time span. The benefits appear stronger in the first decade after the accession when the EU economies were in general growing fast. Nevertheless, also in the post-GFC years, when the EU struggled with the euro crisis, the three accession countries appear to have benefitted from the EU membership. The results for Sweden are nevertheless not as robust as for Finland or Austria.

In the case of Finland, GDP per capita outcomes relative to the counterfactual are affected quite a bit by the volatility of labour input. The weakness of the observed GDP per capita performance relative to the counterfactual in the years following the GFC might in part be due to inadequate adjustment of the labour market institutions to the conditions created by membership in EMU.

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