

# Report on Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

<b>Student:</b>	<b>Jakub Stuchlík</b>
<b>Advisor:</b>	<b>PhDr. Jaromír Baxa, Ph.D.</b>
<b>Title of the thesis:</b>	<b>Who bears the costs of Brexit? A regional perspective</b>

**OVERALL ASSESSMENT** (provided in English, Czech, or Slovak):

Please provide a short summary of the thesis, your assessment of each of the four key categories, and an overall evaluation and suggested questions for the discussion. The minimum length of the report is 300 words.

## Short summary

The thesis examines the impact of Brexit on economic performance of individual regions in the United Kingdom. To do so, it applies a recently developed methodology – the synthetic control method using lasso (SCUL) due to Hollingsworth & Wing (2020), which extends the synthetic control method (SCM) first introduced by Abadie & Gardeazabal (2003). For each UK region, the thesis estimates the effect of Brexit on real GDP in the region in years 2019 and 2020 by comparing the real performance in the region to the performance of a weighted average of regions in other EU countries. It estimates two main specifications, where the first one uses fewer comparison regions but more covariates, and the second one uses most available regions but does not have information on regional economic structure.

The two specifications produce rather different results. The first one indicates, in aggregate, a GDP increase of 0.8% in 2019 and a drop of 8.5% in 2020. The latter suggest a drop of 2% in 2019 and a drop of 13% in 2020.

## Contribution

The thesis claims to be only the second study to estimate regional impacts of Brexit using the synthetic control method. It also represents one of the first applications of the recently developed SCUL methodology. In that sense, it represents a novel contribution in line with expectations for a master's thesis.

XXX.

- lasso
- 2-digit regional aggregation (rather than 1 and 3 digit)

## Methods

The thesis contains an extensive and rich discussion of the methods it uses, both SCM in general and its SCUL variant employed in the analysis. The discussion is detailed and shows a good understanding of the methods, various methodological choices they involve and their strengths and weaknesses.

It should also be commended that most of the methodological choices undertaken in the thesis are well explained and seem reasonable.

That said, there are some important aspects in the methodology used or in the interpretation of the results that are either unclear or problematic:

1. **Model selection based on statistical significance.** The thesis estimates two different specifications, which give relatively different results. The author repeatedly suggests that the latter specification is preferred because it is more in line with other studies and gives statistically significant results for more regions. Similarity of results to other studies is a useful sanity check but not, on its own, an argument to prefer one method over another. More importantly, it is wrong to discriminate between models based on a statistical significance of estimated coefficients, as it could well be that the first method correctly does not reject the null of no effect, while the other method incorrectly rejects it. Instead, it would be useful to try to

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understand why the different specifications give such different results, and then decide which specification is more trust-worthy.

- 2. Inequality** The second sentence of the thesis's abstract claims that the author studies „whether spatial inequality increased“. Answering this question would require (1) estimating the impact on each region, and (2) investigating how these impacts affected a selected measure of inequality. The thesis does (1) but not (2), as regional inequality is not explicitly analysed.
- 3. Why results only for 2019 and 2020?** The analysis marks years 2016 (the year of the referendum) and onwards as „post-treatment“ (see., e.g., Figure 5.2), but it only presents impact results for years 2019 and 2020. Why are impacts in years 2016-2018 not discussed? While those years pre-date the formal exit of the UK from the EU, that is also true of year 2019, which is considered in the analysis.
- 4. Relationship between Brexit vote and impact of Brexit** The OLS analysis of the relationship between the estimated impact of Brexit and the Brexit vote controls for a rich set of variables that were found to be related to the Brexit vote. It has two problems. Firstly, it leads to a regression with 41 observations and almost as many explanatory variables, which makes it not surprising that barely anything is significant. Secondly, it is not clear why the Brexit vote should be correlated with Brexit's impact *conditional on the structural characteristics* that shaped both the vote and Brexit's impact. A simple scatterplot or correlations between the vote and the impact would be more informative.
- 5. The definitions of the variables** used are at times unclear. For example, I did not find how the „productivity“ variable is defined. Is it GVA per worker? Per hour worked? And is the main outcome variable, real GDP, defined in per capita firms? It would not seem so, but Figure 4.1 talks about „real GDP in British regions“ while clearly showing GDP per capita.
- 6. Perfect fit in Figure 5.5** Figure 5.5 shows a perfect fit between the actual region and the synthetic control during the pre-treatment period. Is this indicative of overfitting? At the very least, this should be discussed.

Additionally, the analysis suffers from two important limitations, which are, however, a functions of the selected topic and there was little the author could do about them: the data ending in 2020, i.e. the year when Brexit actually happened, and the concurrent covid epidemic.

## Literature

The thesis contains a comprehensive and appropriate discussion of related literature/

## Manuscript form

The manuscript is well structured, well written and appropriately formatted. There are a few instances of typos, incomplete sentences or dysfunctional links that should be corrected before the thesis is finalised.

## Overall evaluation and suggested questions for the discussion during the defense

The thesis studies an interesting and timely topic, using innovative, recently developed methods. It shows good understanding of the methods used, which are mostly appropriately applied. The thesis is also well written and generally well executed. Overall, I consider it a strong thesis, which, however, stays short of the top grade due to some issues in the empirical analysis and interpretation of the results.

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**SUMMARY OF POINTS AWARDED** (for details, see below):

CATEGORY	POINTS
Contribution (max. 30 points)	25
Methods (max. 30 points)	22
Literature (max. 20 points)	20
Manuscript Form (max. 20 points)	18
<b>TOTAL POINTS</b> (max. 100 points)	<b>85</b>
<b>GRADE (A – B – C – D – E – F)</b>	<b>B</b>

**NAME OF THE REFEREE:** Matěj Bajgar, DPhil.

**DATE OF EVALUATION:** 25th January 2023

Digitálně podepsáno (25.1.2023):  
Matěj Bajgar

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**Referee Signature**

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## **EXPLANATION OF CATEGORIES AND SCALE:**

**CONTRIBUTION:** *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

**METHODS:** *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

**LITERATURE REVIEW:** *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

**MANUSCRIPT FORM:** *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

## **Overall grading:**

<b>TOTAL</b>	<b>GRADE</b>
91 – 100	<b>A</b>
81 - 90	<b>B</b>
71 - 80	<b>C</b>
61 – 70	<b>D</b>
51 – 60	<b>E</b>
0 – 50	<b>F</b>