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LONG-RUN GROWTH EFFECTS OF CARINTHIAN PLEBISCITE

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AUT – Austrian

CL – country-level

GDP – Gross Domestic Product

RL – region-level

RMSPE – Root mean square prediction error

ROW – Rest of the World

SI – Slovenian

INTRODUCTION

The Carinthian Plebiscite defined part of national borders between Austria and Slovenia and divided the previously unified historical region of Carinthia into two parts. Furthermore, it served as a fundamental externally imposed shock that led to two different institutional regimes. The smaller, southern part of Carinthia was in accordance with the Treaty of Saint Germain automatically assigned to Yugoslavia (Slovenia). However, in the sizable northern part of Carinthia citizens had a possibility of self-determination either voting for Yugoslavia or Austria in the 1920 Carinthian Plebiscite.

As Tiemann (2020) addresses Carinthian Plebiscite is eminent historical event for several reasons. Firstly, it was one of the first historical instances when territorial disputes were settled by vote of affected citizens and not decided top down by war winners and politicians. Secondly, it was the first time that women in Carinthia region were also enfranchised (on the other hand franchise extension failed to take place in Yugoslavia up to year 1945). However, most of the literature regarding Carinthian Plebiscite is in the field of history and political sciences. Literature focuses on historical explanation of the Plebiscite (for example Pleterski, 2002), Plebiscite as a case study for ethnic self-determination (for example Reinhard, 2016; Cede, 2012), commemorations of Plebiscite (for example Knappitsch, 2008), pre-Plebiscite military mobilization (for example Révész, 2016) and assessing the proportion of nationalities that voted for a specific country (for example Tiemann, 2020). This thesis contributes to the literature on Carinthian Plebiscite and is the first attempt to disentangle the economic effects of the Plebiscite empirically and quantitatively.

This thesis also contributes to the empirical literature on the economic growth effects of institutional change. I implement the relatively new literature using synthetic control methods to calculate missing counterfactual and answer long-running historical questions. There are other existing papers that have also attempted to analyse the impact of institutional change and institutions on economic growth using the synthetic control method. Abadie, Diamond and Hainmueller (2014) illustrate fundamental concepts of synthetic control method for comparative case studies by measuring the economic effects of German reunification. They find that 13 years after reunification Gross Domestic Product per capita (hereinafter GDP per capita) of synthetic West Germany (that did not reunify with East Germany) is estimated to be about 12% higher than in the actual West Germany – suggesting negative GDP per capita effects of reunification. Lawson, Grier and Absher (2019) for example use synthetic control method to evaluate the 2003 Georgia's Rose Revolution on GDP per capita, infant mortality, employment and inequality. They calculate the missing counterfactual (what would happen if there were no revolution) for above mentioned indices and find that market-liberal reforms that followed the revolution resulted in higher GDP per capita, lower infant mortality, higher employment and higher inequality. They also report the Economic Freedom of the World rating, Corruption Perception Index and Doing Business rating, which all improved significantly in 9 years after the revolution. Pinotti (2015) employs synthetic control method to evaluate costs of organized crime in Apulia and

Basilicata region in southern Italy. His results suggest that the presence of mafia lowers GDP per capita by 16% mainly because it lowers private economic activity, and it directs capital towards less productive public investment. Billmeier and Nannicini (2013) explore if countries that underwent economic liberalization grow faster than those that did not using synthetic control method. They examine the effects of economic liberalization (measured with Sachs-Warner indicator) in selected Asian and African countries on GDP per capita of these countries. They find that economic liberalization has a positive or at least nonnegative effect of GDP per capita growth trajectory. Coricelli, Campos and Moretti (2019) examine institutional integration in Europe with regard to economic growth in countries that joined the European Union in 1973, 1980, 1995 and 2004 enlargement. They find that all countries benefit from EU membership (higher labour productivity and GDP per capita than its counterfactual) except from Greece.

Moreover, the aim of this thesis is to study the impact of Plebiscite on growth trajectories of the Austrian and Slovenian Carinthia. The goal of this thesis is to estimate the impact of externally imposed institutional change on the growth trajectories of the Austrian and Slovenian Carinthia. I will do so using synthetic control method first introduced by Abadie and Gardeazabal (2003). Specifically, I formulated three hypotheses:

1) In the long run, Austrian Carinthia has achieved a higher level of GDP per capita due to its exposure to Austrian institutional regime.
2) Slovenian Carinthia could in the long run have a higher GDP per capita if it could participate in the plebiscite and become part of Austrian institutional regime.
3) The quality of institutions plays a role in explaining the difference in economic growth between Slovenian and Austrian Carinthia.

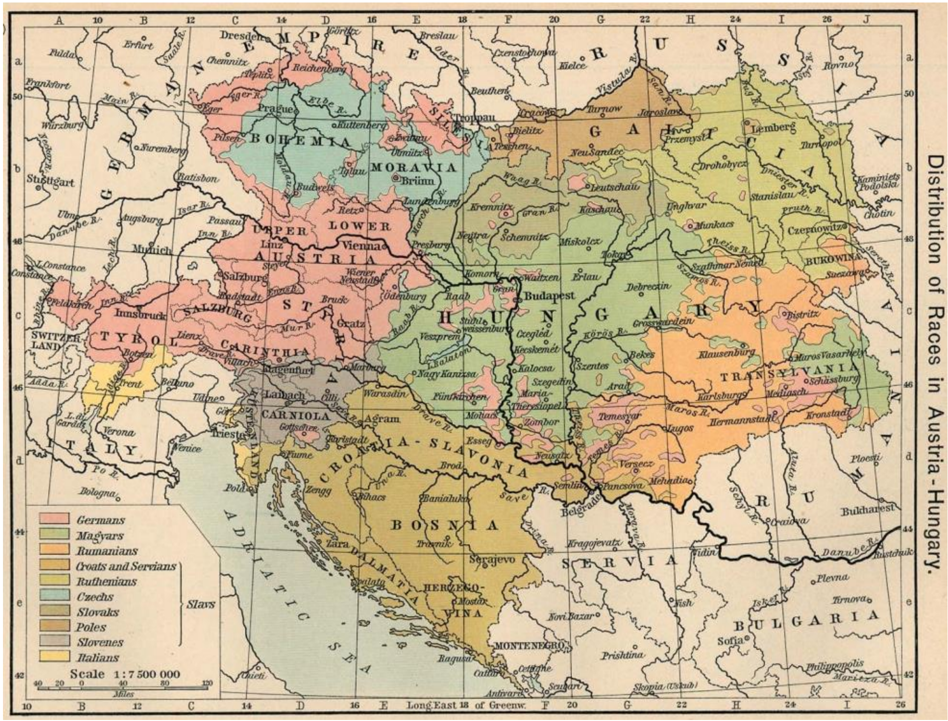
The remainder of this thesis is set up as follows. Part 1 chronicles fundamental events regarding Carinthian Plebiscite. Part 2 describes synthetic control method and data. Part 3 discusses results and robustness checks for each of comparisons undertaken. I execute comparisons with log GDP per capita as well as with GDP per capita for both Austrian and Slovenian Carinthia. In Part 4 the question arises, what part of growth premia is driven by institutional factors and what part by noninstitutional factors (such as access to big internal market in Austria-Germany-Switzerland or access to Yugoslavian market). I address this question by describing possible drivers of growth. Part 5 concludes.

1 CARINTHIAN PLEBISCITE

In 1918 after World War 1 new countries emerged and consequently disputes about borders as well. One of such frictions was between Austria and Kingdom of Serbs, Croats and Slovenes (later known as Yugoslavia) about the border region Carinthia. In the subsequent year after the war local militia groups of both Yugoslavia (*"Boj za severno mejo"*) and Austria (*"Abwehrkampf"*) tried to occupy the area and dispute was finally settled in the 1919 Treaty of Saint Germain.

As Italy advocated for the border on the historic provincial border between Carniola and Carinthia region and Great Britain defended the border on Drava River, the Allies formed special commissions to determine the will of the population on the ground. The most influential was the American commission headed by Sherman Miles, based in Vienna. On January 22, 1919, the Graz-Ljubljana Protocol was issued, which decided that the opinion determined by the American commission would be followed for the state border between Yugoslavia and Austria. Figure 1 displays a map of distribution of races (based on language spoken) in Austria-Hungary according to the 1910 census. The map confirms the previous claims that population in southern Carinthia (mostly in rural areas around the Drava River) mainly spoke Slovene. At the same time, German was the main language in northern Carinthia and in Carinthian cities. Additionally, the map displays that there existed a sizable German-speaking population in Slovenian Styria, which did not undergo any plebiscite – according to the 1910 census around 74 thousand people living in Slovenian Styria listed German as their first language. Germans mostly lived in the cities (such as for example Maribor, Celje and Šoštanj), while rural areas of Slovenian Styria were mostly inhabited by Slovenes. To exemplify, according to the 1910 census population of the city of Maribor consisted of 14% Slovenes and 81% Germans (Melik, 1957 in Godina Golja, 2016). Maribor fell into Yugoslav hands after pro-Slovenian militia group disarmed German Green Guard in 1918 and as already mentioned never underwent a plebiscite.

Figure 1: Distribution of races in Austria-Hungary according to 1910 census



Source: Shephard (1911).

American Commission recommended for small parts of Carinthia (Meža Valley and Jezersko area) to automatically become part of Yugoslavia. The sizeable northern remaining part of Carinthia was divided in Zone A and Zone B (displayed in Figure 2), where Plebiscite was to be held. Zone A, which comprised of Bleiburg, Völkermarkt, Ferlach and Rosegg voting constituencies, was under occupation of Yugoslav armed forces and in 1910 census 70% of people in Zone A spoke Slovene. Meanwhile Zone B (Klagenfurt and region north of Lake Wörth), was under control of Austria and had a majority (90%) German-speaking population. It was decided that the plebiscite would be held first in Zone A, and if successful for the Yugoslav side, subsequently also in Zone B. In the event, that Zone A voted for Austria, Zone B would also automatically fall under Austria.

On October 10, 1920, a plebiscite was held in Zone A. 59.1% (22,055 voters) voted for Austria and 40.9% (15,279) for Yugoslavia. As exhibited in Figure 2 the plebiscite majority (59.04%) voted in favour of annexation to Austria. Despite Zone A forming a unified electoral district, where results were to be obtained by simple majority, voting was organized in four voting constituencies (Rosegg, Ferlach, Bleiburg and Völkermarkt) and 51 municipalities. As evident from the figure, inhabitants of municipalities close to (and in voting constituency) Völkermarkt mostly voted to join Austria (77% for Austria in voting constituency Völkermarkt). Ferlach voting constituency also preferred the Austrian option (56%). In the voting constituencies of Rosegg and Bleiburg, Yugoslavia won by a small margin (53% and 51% respectively). Thus, as said the previously undivided historical formation split into two parts (with two different institutional regimes), which are still known today as Slovenian and Austrian Carinthia.

Figure 2: Results of the Carinthian Plebiscite 1920 by municipality

Source: Adapted from Scheuch (2008) in Wikipedia (2012).

As the preference for Austria won in Zone A, which was predominantly ethno-linguistically Slovene, the second phase of the referendum in northern Zone B, populated chiefly by German speakers, was not realized. Meaning, that most of former Carinthia (with exception of in 1919 Treaty of Saint Germain de jure pre-allocated Meža Valley and Jezersko) fell into Austrian hands.

Figure 3 displays borders of Yugoslavia between 1918 and 1920. Red line represents the border of Yugoslavia after 1920 in the Plebiscite's aftermath. If we compare this map to the map from Figure 2, we can determine that both Austria and Yugoslavia suffered some losses. With the Plebiscite Yugoslavia gave up rural areas of Carinthia with predominantly Slovene-speaking population. Austria on the other had to let go (without any plebiscite) some of Slovenian cities (such as Maribor), where German-speaking population was in majority.

Figure 3: Formation of Yugoslavia

Source: Swanston Map Archives (n.d.).

In line will general designation of geographical units, parts of Carinthia that became part of Yugoslavia and subsequently Slovenia will be called Slovenian Carinthia (also SI Carinthia) in this thesis. The regions that undertook the Plebiscite and decided to stay in Austria, will be called Austrian Carinthia (also AUT Carinthia). Additionally, to prevent inconsistency and lack of clarity in writing, I do not take into account the changing labels of the involved states (e.g., Kingdom of Serbs, Croats and Slovenes) and simply write "Yugoslavia" (after 1991 "Slovenia") and "Austria" throughout this thesis.

2 QUANTIFYING THE EFFECTS OF CARINTHIAN PLEBISCITE

2.1 Approach

Identification of economic effects of Carinthian Plebiscite takes place with synthetic control method using several "matching" strategies. The idea is to undertake multiple comparisons of Carinthia with the rest of the world that could be either (i) countries or (ii) regions separately using (1) log GDP per capita and (2) GDP per capita as a dependent variable. Namely I inspect growth trajectories of synthetic and actual Austrian (AUT) Carinthia in four ways for both (1) log GDP per capita and (2) GDP per capita as the dependent variable. First, I compare (a) Austrian Carinthia with the rest of the world (ROW) on a country-level basis. Followed by (b) region-level comparison of Austrian Carinthia with the rest of the world. These two comparisons give information on how much Austrian Carinthia gained by voting for Austria in the 1920 Plebiscite. Then I employ two region-level comparisons (c) and (d) of Austrian Carinthia that demonstrate counterfactual growth trajectories of Austrian Carinthia's GDP per capita if the majority of residents voted for Yugoslavia in the Plebiscite. I first apply (c) region-level comparison of Austrian Carinthia with Yugoslavia. Later because of possible criticism that the comparison (c) with Yugoslavia does not cover the influence of institutions similar to Yugoslavia but without war, in comparison (d) I add to the control group regions from countries with comparable institutional quality as Yugoslavia: Argentina and Mexico.

Secondly, I construct counterfactual growth path of Slovenian Carinthia had it joined Austria in times in history where this might had been possible. To estimate counterfactual growth trajectories for Slovenian (SI) Carinthia that could become part of Austria, had it not been assigned to Yugoslavia in Treaty of Saint Germain 1919, I employ the same synthetic control method for Slovenian Carinthia again both on (i) country- and (ii) region-level and again using (1) log GDP per capita or (2) GDP per capita in total eight comparisons. I compare Slovenian Carinthia with (e) other countries of the world, where there was no plebiscite, then in (f) I exclude[1] Austria and Hungary from possible countries of comparison and again compare Slovenian Carinthia with other countries of the world. Comparisons (e) and (f) are meant to display, how much Slovenian Carinthia gained (or lost) by joining Yugoslavia. Region-level comparisons (g) and (h) follow the same logic. In (g) I compare Slovenian Carinthia to other regions of the world and in (h) I compare Slovenian Carinthia with other regions of the world and exclude Austrian regions from potential regions of comparison. In region-level comparisons neighbouring regions such as Friuli Venezia Giulia are excluded from donor pool due to potential spillovers.

This approach also has limitations. Ideally, I would want to compare households or cities left and right of the drawn border (i.e., denoted by latitude/longitude line) in regression

[1] This exclusion rule is meant to exclude the possibility of interference with the neighbouring areas that may invoke spillover effects and contaminate the treatment effect of interest.

discontinuity design. Dell (2010) provided a seminal contribution in the field by studying the effects of mita on economic development in Peru. Here, given the obvious data limitations, the analysis is carried out at the aggregate level by comparing the actual Slovenian and Austrian Carinthia with their synthetic peers where we know that plebiscite did not occur. This may inform us about the long-term aggregate effects of both institutional regimes to better understand their economic implications in the long run.

2.2 Methodology

My aim is to examine the contribution of Carinthian Plebiscite results to long-run growth and development of Austrian Carinthia using the synthetic control estimator developed by Abadie and Gardeazabal (2003) and Abadie et al. (2010, 2014). I will illustrate the adopted method on case (1a), in which I compare Austrian Carinthia with the rest of the world, using log GDP per capita as the dependent variable. For all other comparisons (1b-1h) in which I utilize the log GDP per capita as the dependent variable, the procedure is the same.

I approach this problem by comparing the economic growth trajectory of the Austrian Carinthia during the post-Plebiscite era with that of a weighted combination of other countries of the world chosen to resemble the characteristics of the Austrian Carinthia before Plebiscite. Such a convex combination of other countries' growth and development characteristics is called ''synthetic'' Austrian Carinthia, against which I compare the GDP per capita growth trajectory of actual Austrian Carinthia, to get the effect of the Plebiscite on growth.

I observe J + 1 regions in $t = 1,2, \dots, T$ periods. Let Austrian Carinthia be the treated unit ($i = 1$) that undergoes the Carinthian Plebiscite, so that we have J remaining countries that serve as potential controls. The set of countries unaffected by the Plebiscite $i = 2, \cdots, J + 1$ is called the ''donor pool'', which also serves as a set of potential comparisons. Thus, the donor pool is a control sample that consists of countries similar to Austrian Carinthia region (in terms of covariates), but did not undergo the Plebiscite. In my case, I consider the occurrence of the Carinthian Plebiscite as the beginning of the intervention period (which includes the Plebiscite's aftermath).

Following Abadie et al. (2010) in Cavallo, Galiani, Noy and Pantano (2013), let $ln\, y_{it}^{N}$denote the GDP per capita for country i at the time t in the absence of the Plebiscite and let $\ln y_{it}^{I}$ denote the GDP per capita for country i at time t if the country were exposed to the Plebiscite. Let T_0 be the number of periods before the Plebiscite, with $1 \leq T_0 < T$. I assume that the intervention has no effect on the outcome before the implementation period, so for $t \in \{1, \dots, T_0\}$ and all $i \in \{1, \dots, N\}$, GDP per capita should be the same, so we have $Y_{it}^{I} =$

Y_{it}^N (and $lny_{it}^I = ln\, y_{it}^N$). I also assume that outcomes of untreated countries are not affected by the implementation of Plebiscite in the treated units[2].

Then let $\alpha_{it} = \ln y_{it}^I - \ln y_{it}^N$ be the effect of Plebiscite for country i at the time t. Let D_{it} be a dummy variable that takes the value 1 if country i undergoes the institutional treatment at time t and value 0 otherwise. The observed log output per capita for country i at time t is:

$$ln\, y_{it}^I = ln\, y_{it}^N + \alpha_{it} \cdot D_{it} \tag{1}$$

Because only the first region (say, country 1) is exposed to the intervention and only after period T_0 (with $1 \leq T_0 < T$) we have: $D = \begin{cases} 1\ if\ i = 1\ and\ t > T_0 \\ 0\ otherwise \end{cases}$.

I am interested in vector of parameters $(\alpha_{1,T_0+1}, \dots, \alpha_{1,T})$, which capture the post-treatment effect of the plebiscite. For $t \geq T_0$,

$$\alpha_{it} = ln\, y_{1t}^I - ln\, y_{1t}^N = ln\, y_{1t} - ln\, y_{1t}^N \tag{2}$$

Because $\ln y_{1t}$ is observed, to estimate α_{1t} I only need to estimate $ln\, y_{1t}^N$. Meaning that I need to estimate how $ln\, y_{1t}^N$ evolved for Austrian Carinthia comparing to other countries that did not undergo the Plebiscite. It is assumed that $ln\, y_{1t}^N$ follows a latent variable model for all $i = 1, 2, \dots, N$ in the form of:

$$\ln y_{1t}^N = \delta_t + \theta_t Z_i + \lambda_t \mu_i + \varepsilon_{it} \tag{3}$$

where δ_t is an unobserved factor common across all countries, $Z_i \in \mathbb{R}^r$ is a vector of observed covariates unaffected by the Plebiscite, $\theta_t \in \mathbb{R}^r$ is a vector of parameters, $\lambda_t \in \mathbb{R}^F$ is a vector of common unobserved factors, and $\mu_i \in \mathbb{R}^F$ is a vector of unknown factor loadings. ε_{it} are unobserved transitory shocks and I assume they have a zero mean. The latent variable has a property of installing time trends into the model and also allows for heterogeneous responses to multiple unobserved factors. With latent factor model I want to construct a control group that is able to track, reproduce and best synthesize the growth trajectory of Carinthia prior to T_0. This then implies that pre-Plebiscite μ_i are matched between the treatment and control samples.

Let $W = (w_2, \dots, w_{i+1})$ be a vector of weights with $w_i \geq 0 \forall j$ and $w_2 + \cdots + w_{i+1} = 1$. Each value of W represents a potential synthetic control. For a given W, the log per capita GDP for a synthetic control at time t is:

[2] For this reason, I exclude neighbouring regions such as Friuli Venezia Giulia from donor pool due to potential spillovers. Otherwise the interference invokes the spillover effects that biases the treatment effect in question.

$$ln\, y_{w,t} = \sum_{i=2}^{I+1} w_i\, ln\, y_{it}=\delta_t + \theta_t(\sum_{i=2}^{I+1} w_i Z_i) + \lambda(\sum_{i=2}^{I+1} w_i \mu_i) + (\sum_{i=2}^{I+1} w_i \varepsilon_{it}) \qquad (4)$$

As in Spruk (2019) since the most plausible one combination of weights W^* is such that the synthetic control unit matches the treated country in the entire pre-Plebiscite period, the synthetic control associated with W^*reproduces the missing counterfactual and yields an approximately unbiased estimator of α_{1t} given by

$$\hat{\alpha}_{1t} = lny_{1t} - \sum_{i=2}^{I+1} w_i^* \cdot lny_{it} = lny_{1t} - lny_{W^*t} \qquad (5)$$

which corresponds to the gap between the observed outcome and the outcome of the missing counterfactual depicted by the synthetic control unit.

Similarly, if we use (2) GDP per capita as the dependent variable, expression (1) displaying observed output per capita in country i at time t, can be rewritten as follows:

$$Y_{it}^I = Y_{it}^N + \beta_{it} D_{it} \qquad (6)$$

Post-treatment effect of the plebiscite for $t \geq T_0$ is then defined as:

$$\beta_{it} = Y_{1t}^I - Y_{1t}^N = Y_{1t} - Y_{1t}^N \qquad (7)$$

Again, Y_{1t} is already observed, thus to estimate the treatment effect β_{it}, we only need to estimate Y_{1t}^N that follows a latent variable model for all $i = 1,2, \ldots, N$ in the form similar to expression (3).

$$Y_{1t}^N = \delta_t + \theta_t Z_i + \lambda_t \mu_i + \varepsilon_{it} \qquad (8)$$

Let $W = (w_2, \ldots, w_{i+1})$ be a vector of weights with $w_i \geq 0 \forall j$ and $w_2 + \cdots + w_{i+1} = 1$. Each value of W represents a potential synthetic control. For a given W, the per capita GDP for a synthetic control at time t is:

$$Y_{w,t} = \sum_{i=2}^{I+1} w_i\, Y_{it} = \delta_t + \theta_t(\sum_{i=2}^{I+1} w_i Z_i) + \lambda(\sum_{i=2}^{I+1} w_i \mu_i) + (\sum_{i=2}^{I+1} w_i \varepsilon_{it}) \qquad (9)$$

The synthetic control associated with W^* reproduces the missing counterfactual and yields an approximately unbiased estimator of β_{it} (expression 10) and corresponds to the gap between the observed outcome and the outcome of the missing counterfactual depicted by the synthetic control unit.

$$\hat{\beta}_{1t} = y_{1t} - \sum_{i=2}^{I+1} w_i^* \cdot y_{it} = y_{1t} - y_{W^*t} \qquad (10)$$

The same procedure is applied for other comparisons of Austrian Carinthia (2b – 2d) as well as for all comparisons of Slovenian Carinthia (2e – 2h).

2.3 Data

My dependent variables are (1) log GDP per capita or (2) GDP per capita. GDP per capita data is in constant prices adjusted for purchasing power parity in the period 1870-2016. Log GDP per capita is obtained by the logarithm of the value for GDP per capita.

Country-level per capita GDP data is from Bolt and Van Zanden (2014) in Maseland and Spruk (2020a) and is adjusted for PPP differences to be comparable. Sample yields a strongly balanced panel of 187 regions and 57 countries for the period 1870-2016. Region-level per capita GDP data for European and South American regions are from Maseland and Spruk (2020a). Data on US states included in the sample is reconstructed by Maseland and Spruk (2020a) and collected by Bureau of Economic Analysis (1986) series of Current Business Surveys from year 1929 onwards. Estimates for GDP per capita of US states from years 1870 to 1928 are also recalculated by Spruk (2020) and provided by Easterlin (1960a, 1960b) and used by Barro and Sala-i-Martin (1992).

2.4 Covariates

Matching covariates (variables unaffected by plebiscite) can be classified into three distinctive groups: physical geography, legal covariates and pre-Plebiscite GDP per capita dynamics. Physical geography covariates are in the first group and include data on average annual temperature (in °F), annual rainfall (in inches), annual sunshine hours (in hours), latitude and longitude coordinates, indicators for island, desert area and sea access, and data on land area (in square miles). Data on physical geography is obtained from US Geological Survey’s Geographic Information System (GIS). Second group consists of legal covariates and these include data on legal origin of the judicial system. In line with data obtained from La Porta Lopez-de-Silanes and Shleifer (2008) I distinguish between British, German, French and Scandinavian legal origin. The third group of covariates includes data on pre-Plebiscite GDP per capita dynamics, including GDP per capita in 1870, 1900, 1910, 1920 and first lag and second lag of GDP per capita.

Descriptive statistics of covariates are presented in Table 1.

3 RESULTS

3.1 Effects for Austrian Carinthia

3.1.1 Results for models with (1) log GDP per capita as dependent variable

Figure 1 depicts growth trajectory of synthetic and actual Austrian Carinthia with log GDP per capita as dependent variable. I construct synthetic version of Austrian Carinthia using convex combination of donor pool countries/regions that most closely match pre-Plebiscite (1921) geographic, growth and institutional covariates of Austrian Carinthia and did not receive Plebiscite treatment. I distinguish between 4 different (1a-1d) comparisons (and corresponding donor-pools).

Table 2 displays covariate balance for actual and synthetic Austrian Carinthia under all comparisons that adopt log GDP per capita as dependent variable. I can conclude that pre-Plebiscite GDP per capita dynamics and geographical, legal and institutional covariates seem to exhibit sufficient similarity for all comparisons (1a-1d). I can confirm that the parallel trend assumption holds for all comparisons.

Figure 3 exhibits the composition of Synthetic control groups with corresponding weighted donor countries' shares in composition of growth trajectory prior to Plebiscite for all comparisons of Austrian Carinthia with log GDP per capita as dependent variable. I estimate the root mean square prediction error (hereinafter RMSPE) for all comparisons (1a-1d). It ranges from 0.0507 (for region-level comparison with Yugoslavia including low-institutional stability regions) to 0.1035 (for region-level comparison with rest of the world). This indicates synthetic control estimator provides a good fit.

If we compare Austrian Carinthia with other countries of the world (1a), we see that in the short run effect of Plebiscite on Austrian Carinthia is negative, which is probably related to institutional integration into Austria (incurrence of transitional costs) and the fact that the region became a peripheral part of Austria. However, in the long run the effect becomes positive (i.e., materialization of effect of Austrian institutional framework in the long run). Graph (1a) demonstrates that Austrian Carinthia achieved higher GDP per capita in the long run because it avoided Yugoslav institutional regime. For (1a) Country-level comparison of AUT Carinthia with the rest of the world with log GDP per capita as dependent variable, synthetic Austrian Carinthia is composed of 41.3% Czech Republic, 33.6% Turkey, 20.6% United Kingdom and 4.44% Australia. Pointwise difference between synthetic and actual Austrian Carinthia at the end of the sample is 46% in favour of actual Austrian Carinthia – meaning that based on country-level comparison with the rest of the world Austrian Carinthia gained as much as 46% of GDP per capita by joining Austrian institutional regime.

When we compare Austrian Carinthia with other regions of the world (1b), we see that the plebiscite is a "temporary long-term negative institutional change" as Austrian Carinthia only recovers from the Plebiscite in the last years. This probably indicates that the post-war conditions for economic growth were not so good, as if they were without institutional instability. In comparison (1b) with synthetic Austrian Carinthia is comprised of following regions: 51.1% Calabria, 42.3% Schleswig-Holstein and 6.6% Idaho.

Ultimately, if we compare Austrian Carinthia with an alternative plebiscite scenario (comparisons 1c), where the whole region hypothetically falls under Yugoslav control. That is in (1c) we are comparing Austrian Carinthia with all ex-Yugoslav regions that were part of the Austrian Empire (all Slovenian regions and Dalmatian regions). We see that in the short run Austrian Carinthia develops and grows slower than the counterfactual scenario (the plebiscite is probably an expensive internal shock). In the medium run it develops in tandem with the control group until the 1980s, but at the same time avoids instability and enormous negative effects of war in Yugoslavia. Down to the present-day Austrian Carinthia is as much as 63% richer than if it remained part of Yugoslavia. Composition of synthetic Austrian Carinthia consists of 78.2% Upper Carniola and 21.8% Split-Dalmatia.

One could criticise that the comparisons (1c) with ex-Yugoslav regions does not cover the influence of institutions similar to Yugoslav institutions but without war. To this end, I added to the control group regions from countries with comparable institutional quality as Yugoslavia. To determine similarity in terms of institutions I worked with V-Dem scores (Coppedge, 2021) on liberal democracy and electoral democracy (i.e., polyarchy). Yugoslavia's average liberal index between 1918 and 1939 is 0,115. Countries most similar to Yugoslavia based on liberal democracy index between years 1918 and 1939 are Brazil, Palestine, Portugal, Malaysia and Gambia (average indices between 0,109 and 0,117). Mexico and Argentina are somewhat similar. However, Mexico has a quality of institutions slightly worse than Yugoslavia (average index of 0,099 between 1918 and 1939) and Argentina slightly better (0,312). Average electoral democracy index for Yugoslavia between 1918 and 1939 is 0,149. Countries most similar to Yugoslavia are Bolivia, El Salvador, India, Italy, Nigeria and Suriname (average indices for years 1918-1939 ranging from 0,144 to 0,154). Mexico (0,1939) and Argentina's (0,403) average electoral democracy index is slightly better than Yugoslavia's. At the end I added regions from Argentina and Mexico to the control group, because a) there were no possible spillover effects (such as with Italy), b) institutional quality of Yugoslavia and both countries were similar 1918-1939 and c) there was no war in Argentina or Mexico.

When reiterating the specification with the enriched control group (comparisons 1d), we see that the effect is very similar or even higher than in (1c) (+98% at the expense of avoiding Yugoslavia in 1d). If we include other low-institutional quality regions in the donor pool synthetic Austrian Carinthia with log GDP per capita as dependent variable contains: 41.2% Slovenian Carinthia, 29.5% Split-Dalmatia and 29.2% Baja California Norte.

3.1.2 Results for models with (2) GDP per capita as dependent variable

To determine if the quality of fit improves, I specified models that adopt GDP per capita instead of log GDP per capita as dependent variable and reiterated the synthetic control method.

Figure 2 presents growth trajectory of synthetic and actual Austrian Carinthia with GDP per capita as dependent variable.

Table 3 exhibits covariate balance for comparisons (2a-2d). Here, we can establish, that when we adopt GDP per capita as a dependent variable (2a-2d), the similarity of pre-Plebiscite per capita dynamics and covariates between synthetic and actual Austrian

Carinthia is even greater than in previous iterations that used log GDP per capita as dependent variable.

Figure 4 exhibits the composition of Synthetic control groups for all comparisons of Austrian Carinthia with GDP per capita as dependent variable and corresponding weighted donor countries' shares in composition of growth trajectory prior to Plebiscite. When we adopt GDP per capita as dependent variable (2a-2d) the root mean square prediction error (RMSPE) ranges from 118.398 (in comparison (2d)) to 171.972 in (2a) country-level comparison of Austrian Carinthia with the rest of the world. It seems that in comparisons (2a-2d) with GDP per capita as dependent variable synthetic control estimator provides an even better fit than in previous iterations that used log GDP per capita as dependent variable.

If we compare Austrian Carinthia with other countries of the world (2a), we see that the case is similar to the first specification (1a), that used log GDP per capita as dependent variable. Effects of Plebiscite on Austrian Carinthia are again negative in the short run and become positive in the long run. Pointwise difference at the of the sample is slightly greater than in (1a) – based on country-level comparison with the rest of the world Austrian Carinthia gained as much as 52,5% of GDP per capita by joining Austrian institutional regime. Synthetic Austrian Carinthia with GDP per capita as dependent variable has a similar composition as in comparison (1a) and is composed of 58,5% Czech Republic, 32,3% Turkey and 9,2% United Kingdom.

When we compare Austrian Carinthia with other regions of the world (2b), we see that the plebiscite is a "temporary long-term negative institutional change" as Austrian Carinthia only recovers from the Plebiscite in the last years. This is in line with results in (1b), when we used log GDP per capita as dependent variable. Composition of synthetic Austrian Carinthia in (2b) slightly changes (in comparison to (1b)) and is comprised of 55,1% Schleswig-Holstein 26,7% Quintana Roo, 14,5% Molise and 3,7% Idaho. At the end of the sample the difference between actual and synthetic Austrian Carinthia is 0,6%. Region-level comparison again yields smaller difference between synthetic and actual Austrian Carinthia than country-level comparison.

If we let Austrian Carinthia hypothetically fall under Yugoslav control (2c), using GDP per capita as dependent variable again yields similar results as with log GDP per capita. We see that in the short run Austrian Carinthia stagnates compared to the counterfactual scenario. In the medium run it develops in tandem with the control group until the 1980s, but at the same time avoids instability and enormous negative effects of war in Yugoslavia. At the end of the sample Austrian Carinthia is as much as 64% richer than if it remained part of Yugoslavia. Composition of synthetic Austrian Carinthia is similar with both log GDP (1c) and GDP per capita (2c) as dependent variable. In (2c) it consists of 71% Upper Carniola and 29% Split-Dalmatia.

In comparison (2d) I enrich the control group of (2c) (consisting of ex-Yugoslav regions) with Mexico and Argentina and reiterate the process. We see that the effect is very similar or even higher than in (2c) (+94% at the expense of avoiding Yugoslavia). With GDP per capita as dependent variable the largest donors change in the donor pool change order and synthetic Austrian Carinthia is comprised of 45,3% Split-Dalmatia, 38,7 % Slovenian Carinthia, 11,7% Baja California-Norte and 4,4% Santa Cruz.

3.1.3 In-space Placebo tests for all models of Austrian Carinthia

To determine the significance of results, I run a series of in-space placebo tests exhibited in Figures 5 and 6. In-space placebo test is a robustness test, where each potential control unit is in turn used as a treated unit in the same treatment period. I therefore ask a question of how large (log) GDP per capita gaps would be for other countries that did not undergo Plebiscite, if I expose them to Plebiscite intervention. If the results show that post-Plebiscite other countries exhibit similar magnitudes of gaps in growth as Austrian Carinthia, than the results for Austrian Carinthia are not significant. If on the other hand results display that gaps in growth for Austrian Carinthia are uniquely large, then I can conclude that my analysis demonstrates significant effect of the Plebiscite. The procedure is as follows, using synthetic control method I estimate (log) GDP per capita gap for all other countries/regions in the donor pool, as if they underwent the Plebiscite. In each iteration I reassign the 1920 Plebiscite to one of the countries/regions in the donor pool moving Austrian Carinthia to the donor pool. I then estimate the effect of randomly assigned Plebiscite for each Placebo run. This way I obtain (log) GDP per capita gaps for all countries/regions in the donor pool that did not undergo the Plebiscite. Figures 5 and 6 exhibit the results of In-space placebo tests with log GDP per capita as dependent variable. The light blue lines represent the log GDP per capita gap associated with each of the Placebo runs for countries in the donor pool. They display the difference between actual and synthetic (log) GDP per capita of donor countries if they underwent the Plebiscite. The black line denotes the gap estimated for Austrian Carinthia. Results for country and region level comparison (1a and 1b, 2a and 2b) with the rest of the world establish that the gap in (log) GDP per capita is not large compared to other countries in the sample during most of the post-Plebiscite time, but the gap widens substantially in the last 10 years of the sample. This is in line with Figure 1 (1a and 1b) and Figure 2 (2a and 2b) where I already determined that the effects of Carinthian Plebiscite become positive only in the long run. For comparison (1c) and (1d), as well as (2c) and (2d) figures depict that the estimated gap for Austrian Carinthia is uniquely large in comparison to the GDP per capita gaps of other states in the donor pool. This can be especially said for comparison (2c). Figure 5 also demonstrates that synthetic control method is an excellent estimator of pre-Plebiscite GDP per capita for comparisons 1a, 1b and 1d (as pre-Plebiscite values of GDP per capita gap are close to 0). It also seems reasonably good estimator for comparison (1c) and estimating log GDP per capita gaps for other countries/regions in the donor pool. Similarly, Figure 6 indicates that synthetic control method is an even more excellent estimator of pre-Plebiscite GDP per capita, when we adopt GDP per capita as dependent variable for all comparisons (as pre-Plebiscite values of GDP per capita gap are again close to 0).

3.1.4 Randomization based p-values for all models of Austrian Carinthia

Figures 7 and 8 display randomization-based p-values indicating whether the growth effect of the Plebiscite could be explained by chance. This kind of quasi-randomization inference provides the probability of estimating a placebo per capita (log) GDP gap of the magnitude of the Austrian Carinthia under a random permutation of the intervention. The resulting probability indicates the likelihood of obtaining the post-Plebiscite growth effects of Plebiscite that are driven by chance.

The results establish that for comparison (1a) probability of obtaining effects of similar magnitude to those of avoiding Yugoslavia by chance first fall and then start rising after year 20 (after Plebiscite), reach peak in year 40 (probability of 100%) and have a tendency to fall till the end. Examining more closely we can notice that around year 1960 (40 years after Plebiscite) synthetic Austrian Carinthia and Austrian Carinthia graphically overlap. Meaning that the effects of Plebiscite start yielding positive benefits and that the gap become positive and widens. In a similar way the probability of obtaining the gap by chance falls and reaches 36% at the end of the sample. A similar occurrence (end of ample gap of 20% in (2a)) is also exhibited, when we use GPD per capita instead of log GDP per capita as dependent variable. For region-level comparison (1b and 2b) of Austrian Carinthia with Rest of the World (hereinafter ROW) the probability of obtaining results by chance has a tendency to fall from year 10 to year 70 after plebiscite, but tends to rise from year 80 until the end of the sample (reaching 67% in (1b) and 79% (2b) probability that the end of the sample GDP per capita gap is obtained by chance). For comparisons (1c) and (1d) probabilities are low at the early stage after Plebiscite up to year 30 after Plebiscite. Both figures than have two peaks in years 30 and 70 after Plebiscite. From year 70 onwards both figures exhibit a fall in probability of obtaining results by chance. Reaching 0% by the end of the observed period. Results are also similar, when we adopt GDP per capita as dependent variable (2c and 2d). We can observe low probabilities at the early stage after Plebiscite, two peaks and then a fall in probability of obtaining results by chance, reaching 0% (2c) and 9% (2d) probability at the end of the sample. Thus, this evidence suggests that joining Yugoslavia after Carinthian Plebiscite causes a statistically significant decline in GDP per capita in the long run.

3.1.5 Results in terms of hypotheses

Based on results of synthetic control estimator for Austrian Carinthia we can consider hypothesis 1): 'In the long run, Austrian Carinthia has achieved a higher level of GDP per capita due to its exposure to Austrian institutional regime.' Comparison (1a), (1b), (2a) and (2b) exhibit GDP per capita gains for Austrian Carinthia, as a result of joining Austria. Results with both GDP per capita as well as with log GDP per capita confirm the hypothesis and show that in the long (and medium) run Austrian Carinthia achieved higher levels of

GDP per capita due to its exposure to Austrian institutional regime. We can observe that Austrian Carinthia developed faster in the short run in response to joining Austria after WW1. Totalitarian political control and socialist economic policies of Third Reich and WW2 dampened this trend. After WW2 it develops in tandem with the control group but because of the institutional stability enjoyed by Austria, it avoids Yugoslav war and is much richer in per capita GDP terms today. Results in region-level comparison in both log GDP per capita as well as with GDP per capita as dependent variable however only partly support the hypothesis and imply the Austrian Carinthia only recovered from the Plebiscite in the last years.

The hypothesis can also be confirmed by looking at the alternative Plebiscite scenario: annexation to Yugoslavia, shown by comparisons (1c and 2c) and (1d and 2d). By avoiding war and institutional shocks of Yugoslavia Austrian Carinthia is to this day richer than if it remained part of Yugoslavia. Altogether, it can be argued that, because of the plebiscite vote for Austria, Austrian Carinthia has much improved growth trajectory relative to the plausible counterfactual scenarios.

3.2 Effects for Slovenian Carinthia

3.2.1 Models with (1) log GDP per capita as dependent variable

Figures 9 displays log GDP per capita growth trajectory for both synthetic and actual Slovenian Carinthia using synthetic control method. I construct synthetic version of Slovenian Carinthia using convex combination of donor pool countries that most closely match pre-Plebiscite (1921) geographic, growth and institutional covariates of Slovenian Carinthia. I distinguish between 4 different (1e-1h) comparisons and corresponding donor-pools.

Table 4 shows covariate balance for actual and synthetic Slovenian Carinthia under comparisons 1e-1h. I can conclude that pre-Plebiscite GDP per capita dynamics and geographical, legal and institutional covariates seem to exhibit sufficient similarity for all comparisons, so that the parallel trend assumption holds.

Figure 11 displays the composition of Synthetic control groups and corresponding weighted donor countries shares in composition of growth trajectory prior to Plebiscite for all comparisons with log GDP per capita as dependent variable.

Slovenian Carinthia is developing worse than the counterfactual after the plebiscite in both country level comparisons (1e-1f). In the first 30 years after the Plebiscite synthetic Slovenian Carinthia and actual Slovenian Carinthia move in tandem, afterwards GDP per capita of synthetic Slovenian Carinthia starts to grow more. Meaning, that in the long run Slovenian Carinthia develops substantially worse than in the counterfactual scenario. Quantitatively, observed per capita GDP gaps at the end of the sample for comparisons (1e) and (1f) are 46% and 35%, respectively. The donor pool for Slovenian Carinthia consists of

70.4% Austria, 21.3% South Korea, 4.1% Hungary, 2.3% Turkey, 2% Nepal. If we exclude Austria and Hungary from the donor pool, synthetic control group for Slovenian Carinthia is comprised of 62.4% Germany, 14.2% South Korea, 10.9% China, 4.8% Turkey, 4.6% Czech Republic, 3% Nepal.

Compared to other regions (1g-1h), the effect is very similar. In the short run there is a milder structural breakdown (possibly because of inferiority of the Yugoslav institutional framework and trade flows compared to the counterfactual scenario), in the long run the effect becomes large and statistically significant. In comparison (1h) the end-of-sample per capita GDP gap between synthetic Slovenian Carinthia and the control group is -30% in favour of synthetic Slovenian Carinthia, which only confirms the thesis about the long-term harmfulness of the Yugoslav institutional regime for economic development. I can assume that in the long run, Slovenian Carinthia could avoid all the instability and institutional pitfalls that Yugoslavia had by joining Austria. In region-level comparison (1g) the biggest share in the donor pool for synthetic Slovenian Carinthia belongs to South Styria - Celje (54.6%) followed by Slovene Littoral (33.2%), Berlin (7.1%), Littoral–Inner Carniola Statistical Region (2.7%), Arizona (2%) and Misiones (0.3%). If we exclude regions of former Austrian empire from the dataset then the synthetic control donor pool for region-level comparison of Slovenian Carinthia contains: 41.7% Molise, 30.3% Quintana Roo, and 28.1% Schleswig Holstein. The effect is similar, but somewhat larger in the second iteration.

Root mean square prediction error ranges from 0.0499 (for region level comparison g) to 0.1107 for region level comparison excluding former Austrian empire regions. This indicates that synthetic Slovenian Carinthia provides a good fit for pre-plebiscite GDP per capita trajectory of actual Slovenian Carinthia.

3.2.2 Models with (2) GDP per capita as dependent variable

To inspect if the quality of fit improves if we use GDP per capita instead of log GDP per capita as a dependent variable, I reiterated the synthetic control method. When the level per capita GDP is used instead of the logarithmic version we can observe that the gap for SI Carinthia becomes much bigger in the long run. The quality of fit improves as well.

Figure 10 displays GDP per capita growth trajectory for both synthetic and actual Slovenian Carinthia using synthetic control method with GDP per capita as dependent variable.

Table 5 displays covariate balance for actual and synthetic Slovenian Carinthia under comparisons (2e-2h). I can conclude that pre-Plebiscite GDP per capita dynamics and geographical, legal and institutional covariates seem to exhibit sufficient similarity for all comparisons, so that the parallel trend assumption holds.

Figure 12 exhibits the composition of Synthetic control groups and corresponding weighted donor countries' shares in composition of growth trajectory prior to Plebiscite for all comparisons of Austrian Carinthia with GDP per capita as dependent variable. When we adopt GDP per capita as dependent variable (2e-2h) the root mean square prediction error (RMSPE) ranges from 44.094 (in comparison (2g)) to 113.769 in (2h). It seems that in comparisons (2e-2g) with GDP per capita as dependent variable synthetic control estimator provides an even better fit than in previous iterations that used log GDP per capita as dependent variable.

Similarly, to when we adopted log GDP per capita as dependent variable Slovenian Carinthia is developing worse than the counterfactual after the plebiscite in both country level comparisons (2e-2f) also when we use GDP per capita as dependent variable. In the first 30 years after the Plebiscite synthetic Slovenian Carinthia and actual Slovenian Carinthia move in tandem, afterwards GDP per capita of synthetic Slovenian Carinthia starts to overtake. Meaning, that in the long run Slovenian Carinthia develops substantially worse than in the counterfactual scenario. Quantitatively, observed per capita GDP gaps at the end of the sample for comparisons (2e) and (2f) are -51% and -37%, respectively. These gaps convey, that Slovenian Carinthia lost as much as 51% by not joining Austria. The donor pool for Slovenian Carinthia consists of 58,9% Austria, 39.3% South Korea and 1.8% Jamaica. If we exclude Austria and Hungary from the donor pool, synthetic control group for Slovenian Carinthia is comprised of 46,1% Czech Republic. 43,8% South Korea, 7% Germany, 1.9% Jamaica 1,1% Turkey.

If we compare Slovenian Carinthia to other regions (2g-2h), the negative effect of Carinthian Plebiscite becomes large and statistically significant in the long run. This is in line with results obtained when adopting log GDP per capita as dependent variable (1g-1h). The end of the sample GDP per capita gap is -20% (2g) and -18% (2h) in favour of synthetic Slovenian Carinthia. Implying that based on estimates from regional comparison, Slovenian Carinthia lost estimated 20% (18%) of end of sample GDP per capita, because it became part of Yugoslav institutional regime. Estimated gap is slightly smaller than in comparisons (1g-1h), where we adopted log GDP per capita as dependent variable. In region-level comparison (2g) the biggest share in the donor pool for synthetic Slovenian Carinthia belongs to South Styria - Celje (63,4%) followed by Slovene Littoral (26,9%), Berlin (5.3%), Littoral–Inner Carniola Statistical Region (2.4%), Vienna (1,5%) and Tlaxcala (0.5%). If we exclude regions of former Austrian empire from the dataset then the synthetic control donor pool for region-level comparison of Slovenian Carinthia contains: 64,1% Quintana Roo, 35,6% Schleswig Holstein and 0,3% Molise. The effect is similar, but somewhat larger (18%) in the second iteration (2h).

3.2.3 In-space placebo tests for all models of Slovenian Carinthia

Similar to comparisons for Austrian Carinthia I run a series of placebo tests to determine statistical significance of results for Slovenian Carinthia. Results are exhibited in Figures 13 and 14. Results for country level comparison (1e and 1f as well as 2e and 2f) show that the gap in log GDP per capita for Slovenian Carinthia is very large in comparison to the GDP per capita gaps of other placebo runs. This indicates that because placebo-runs do not exhibit similar magnitudes of gaps in growth as Slovenian Carinthia the results for Slovenian Carinthia are significant. Similarly, for region-level comparisons (1g and 1h as well as 2g and 2h) the GDP per capita gap is also somewhat larger than of other countries in the donor pool. Figure also shows that synthetic control method is a reasonably good estimator of pre-Plebiscite GDP per capita for all comparisons of Slovenian Carinthia as pre-Plebiscite values of GDP per capita gap are close to 0.

3.2.4 Randomization based p-values for all models of Slovenian Carinthia

Figures 14 and 15 display randomization-based p-values indicating whether the (log) GDP per capita growth effect of the Plebiscite for Slovenian Carinthia could be explained by chance. The resulting probability indicates the likelihood of obtaining the post-Plebiscite growth effects of Plebiscite that are driven by chance. For both country-level comparisons (1e) and (1f), where we adopt log GDP per capita as dependent variable probabilities of obtaining results by chance are similar. Up to year 60 after Plebiscite there is an indefinable tendency of peaks and throughs. From year 60 after Plebiscite onwards there is a tendency of graph to fall, with one minor peak at year 80 after Plebiscite. Meaning, that the probability of obtaining the gap this size by chance falls and reaches 25% (1e) and 33% (1f) at the end of the sample. For country-level comparison (2e), where we adopt GDP per capita as dependent variable, the probability of obtaining results by chance is falling from year 20 onwards and reaches 7% at the end of the sample. For comparison (2f) there is a falling tendency from year 60 after Plebiscite, with one minor peak at year 80 after Plebiscite. The probability of obtaining the gap this size by chance falls and reaches 22% at the end of the sample. For region-level comparisons (1g) and (1h), in which we adopt log GDP per capita as dependent variable, the effect gradually becomes large over time. We can notice that if the GDP per capita gap between synthetic and actual Slovenian Carinthia at the end of the sample is larger (as in (1e) and (1g)) and that there is a smaller probability that it is obtained by chance. For region-level comparisons (2g) and (2h) the effect gradually becomes large over time. The end of the sample probability that gap this big would be obtained by chance is 60% and 67%, respectively.

3.2.5 Results in terms of hypotheses

In the introduction, I put forward the following hypothesis regarding Slovenian Carinthia: ‘Slovenian Carinthia could in the long-run have a higher log GDP per capita if it could participate in the plebiscite and become part of Austria.’ Results of all comparisons (1e-1h) that adopt log GDP per capita confirm this hypothesis. Additionally, comparisons (2e-2h) that use GDP per capita as dependent variable have an even better quality of fit and larger GDP per capita gaps, which also confirms the hypothesis. All comparisons show that synthetic Slovene Carinthia has a long-term (log) GDP per capita higher than actual Slovene Carinthia. Therefore, I can assume that Slovenian Carinthia could avoid all the instability and institutional pitfalls that Yugoslavia had by joining Austria. Joining Yugoslavia entailed a sequence of bad institutional choices that cumulatively imposed a high penalty, which would be much less likely to materialize had the region been linked with Austria after World War 1.

3.3 Robustness check

3.3.1 Models with (1) log GDP per capita as dependent variable

Lastly, I assess the robustness of results by asking whether the estimated growth effects of Carinthian Plebiscite are robust in the event of alternative composition of the synthetic control groups. Klößner et. al. (2018) show, that uncertainty about some of the predictor weights, might have consequences for the composition of synthetic control group. Meaning, that leaving out certain countries from the donor pool might have ramifications on results. I therefore preform the leave-one-out analysis, which can be also used to construct confidence intervals to get maximum and minimum effect of the treatment. More specifically, for each comparison of Slovenian and Austrian Carinthia I leave the country with the largest weight share outside of the donor pool and repeat the synthetic control method procedure for each comparison.

Figures 17 and 19 report the estimated growth effect of the Carinthian Plebiscite for each comparison when country/region with the largest weight share is dropped from the donor pool. Results-wise, the evidence confirms the original growth effect of the Carinthian Plebiscite from Figure 1 and Figure 9 for majority of comparisons (1a, 1d, 1f, 1g, 1h). Leaving the most important country out of the donor pool has very little influence on the pre-treatment covariate imbalance and the RMSPE (which is between 0,0576 and 0,1189 and consistent with previous results), since each treated country appears to be well matched with the synthetic control group prior to 1921. This supports an argument that in comparisons (1a), (1d), (1f), (1g) and (1h) the counterfactual growth and development trajectory is not driven by the artificially created lack of fit.

Figures 21 and 23 report the composition of restricted synthetic control groups. Leaving the biggest donor out of the donor pool, changes the composition of synthetic control groups. Comparing Austrian Carinthia with other countries of the world (1a) and leaving Czech Republic as the biggest donor out of the donor pool, synthetic Austrian Carinthia is composed of 43,3% Turkey, 29,9% United Kingdom, 16,4% Hungary, 5,3% Australia and 5% Switzerland. The effect on GDP per capita at the end of the sample is 47% and is almost identical to the effect (46%), when Czech Republic is included in the sample. In comparison (1b) excluding Calabria out of the donor pool, synthetic control group is composed of 50,8% Molise, 42,2% Schleswig-Holstein and 7% Idaho. Pointwise there is a difference in magnitude and direction of the effect when we exclude Calabria out of the donor pool. End of the sample difference between GDP per capita of actual and synthetic Austrian Carinthia is -6%. Since Calabria had a 51.1% share in the donor pool, it seems that excluding such a high-leverage donor changes the results of the synthetic control method in regional comparison of Austrian Carinthia to the rest of the world. Comparing Austrian Carinthia to

Yugoslavia (1c) and excluding Upper Carniola from being a potential donor, we obtain synthetic Austrian Carinthia composed of 86,8% Ljubljana and 13,2% Split-Dalmatia. Results suggest that there is still a negative effect of joining Yugoslavia, but the magnitude of it drops substantially (from 63% to 7%, when I exclude Upper Carniola from the sample). If we compare Austrian Carinthia to Yugoslavia and other low-institutional stability regions and exclude Slovenian Carinthia (1d) as the largest donor out of the sample, then the synthetic Austrian Carinthia is composed of 36,5% Maribor – South Styria, 32,2% Baja California Norte and 31,3% Split-Dalmatia. The effect stays very similar (+ 91% at the expense of avoiding Yugoslavia).

For Slovenian Carinthia omitting Austria from the donor pool in CL comparison with the rest of the world (1e) Figure 23 exhibits composition of synthetic Slovenian Carinthia as follows: 81,5% Hungary, 9,4% China, 4,4% South Korea, 4,3% Turkey and 0,4% Nepal. The gap between actual and synthetic Slovenian Carinthia at the end of the sample is 21%. For (1f) country level comparison with ROW without Hungary and Austria, eliminating largest donor Germany attains a composition of synthetic Slovenian Carinthia as 67,9% Czech Republic, 22,8% South Korea, 7,3% Turkey, 1,4% Nepal and 0,6% China. The end of the sample gap between actual and synthetic Slovenian Carinthia is -19%. In region level comparison with ROW (1g) excluding South Styria (Celje) from the donor pool produces: 55,7% South Styria (Maribor), 36,8% Slovene Littoral, 3,5% Arizona, 2,1% Littoral–Inner Carniola Statistical Region and 2% Berlin. The gap between actual and synthetic Slovenian Carinthia is -14% at the end of the sample. In region level comparison with ROW that omits Austrian regions from the donor pool (1h) eliminating Molise as the biggest donor we obtain composition of synthetic Slovenian Carinthia as: 40% Calabria, 31,2% Quintana Roo and 28,8 Schleswig Holstein. The end-of-sample gap between actual and synthetic Slovenian Carinthia is -15%.

As for the results, a different composition of synthetic Austrian and Slovenian Carinthia has no or very little effect on them in comparisons (1a), (1d), (1f), (1g) and (1h). However, as already mentioned in region-level comparison of Austrian Carinthia with Yugoslavia, when determining the effect of alternative result of Plebiscite; annexation of Austrian Carinthia to Yugoslavia, leaving Upper-Carniola (with 78,2% weightage) as a high-leverage donor out of the donor pool creates a substantially bigger gap in GDP per capita in comparison to the actual scenario. The effect therefore occurs in the same direction, but is significantly greater. Conversely, comparison (1b) yields result that are of smaller size and also of different direction, if we exclude Calabria (with 51,5%) form the donor pool. Next difference in results after altering the composition of the synthetic region occurs in comparison (1e) in which we compare Slovenian Carinthia to the rest of the world. It seems that when leaving Austria out of the donor pool results do not uphold. Slovenian Carinthia is developing better than synthetic Slovenian Carinthia ‘which joined Austria’’. It seems like Slovenian Carinthia in Austria never recovers from the institutional shock that the Plebiscite would be and that results for comparison (1e) are not robust. However, given that comparison (1f) which already excludes Austria and Hungary from the donor pool before the leave-one-out analysis demonstrates long-run robustness of results, along with results from region-level comparison, I can conclude that the effect of joining Austria for Slovenian Carinthia is positive regardless of whether comparison (1e) is robust or not.

3.3.2 Models with (2) GDP per capita as dependent variable

Figures 18 and 20 report the estimated growth effect of the Carinthian Plebiscite for each comparison when country/region with the largest weight share is dropped from the donor pool. Results-wise, the evidence confirms the original growth effect of the Carinthian Plebiscite from Figure 2 and Figure 10 for majority of comparisons (2a, 2b, 2d, 2f, 2g, 2h). Leaving the most important country out of the donor pool again has very little influence on the pre-treatment covariate imbalance and the RMSPE (which is between 47,7355 and 197,594 and consistent with previous results), since each treated country appears to be well matched with the synthetic control group prior to 1921. In most of the comparisons the counterfactual growth trajectory is therefore not driven by artificially created lack of fit.

Figures 22 and 24 report the composition of restricted synthetic control groups. Leaving the biggest donor out of the donor pool, changes the composition of synthetic control groups. Comparing Austrian Carinthia with other countries of the world (2a) and leaving Czech Republic as the biggest donor out of the donor pool, synthetic Austrian Carinthia is composed of 46% Hungary, 34,2% Turkey, 17,9% United Kingdom and 1,9% Australia. The effect on GDP per capita at the end of the sample is 63% and is larger than the effect (52,5%), when Czech Republic is included in the sample. In comparison (2b) excluding Schleswig-Holstein out of the donor pool, synthetic control group is composed of 45,9% Niedersachsen, 26,4% Molise, 26,2% Quintana Roo and 1,5% Idaho. Pointwise there is very small difference in magnitude of the effect when we exclude Schleswig-Holstein out of the donor pool. End of the sample difference between GDP per capita of actual and synthetic Austrian Carinthia is 3%. Comparing Austrian Carinthia to Yugoslavia (2c) and excluding Upper Carniola from being a potential donor, we obtain synthetic Austrian Carinthia composed of 81,4% Ljubljana and 18,6% Split-Dalmatia. Results suggest that there is still a negative effect of joining Yugoslavia and the magnitude of it becomes substantially smaller, when I exclude Upper Carniola from the sample (end of sample GDP gap of 6,4%). If we compare Austrian Carinthia to Yugoslavia and other low-institutional stability regions and exclude Split-Dalmatia (2d) as the largest donor out of the sample, then the synthetic Austrian Carinthia is composed out of 57,2 % Lika-Senj County, 24,4% Southern Styria – Celje, 13,3% Baja California Norte and 5,1% Santa Cruz. The effect stays practically the same (+ 94% at the expense of avoiding Yugoslavia).

For Slovenian Carinthia omitting Austria from the donor pool in CL comparison with the rest of the world (2e) Figure 24 exhibits composition of synthetic Slovenian Carinthia as follows: 46% Hungary, 34,2% Turkey, 17,9% United Kingdom and 1,9% Australia. The gap between actual and synthetic Slovenian Carinthia at the end of the sample is -3% and is very small comparing to scenario, in which we do not exclude Austria from the donor pool. For (2f) country level comparison with ROW without Hungary and Austria, eliminating largest donor Czech Republic attains a composition of synthetic Slovenian Carinthia as 76% Hungary, 20,6% South Korea, 2,8% Jamaica and 0,05% Turkey. The end of the sample gap between actual and synthetic Slovenian Carinthia is somewhat larger (-47%) than if Czech Republic is not included in the sample. In region level comparison with ROW (g) excluding South Styria (Celje) from the donor pool produces: 63,5% South Styria (Maribor), 29% Slovene Littoral, 3,6% Berlin, 3,1% Littoral–Inner Carniola Statistical Region, 0,8% Tlaxcala. The gap between actual and synthetic Slovenian Carinthia is -13% at the end of the sample. In region level comparison with ROW that omits Austrian regions from the donor pool (h) eliminating Quintana-Roo as the biggest donor we obtain composition of synthetic Slovenian Carinthia as: 40% Molise, 19,8% Hawaii, 18,4% Schleswig-Holstein, 15,9% Tlaxcala and 5,9% Tabasco. The end-of-sample gap between actual and synthetic Slovenian Carinthia rises substantially and is -50%.

In the matter of results, a different composition of synthetic Austrian and Slovenian Carinthia has no or very little effect on them in comparisons (2a), (2b), (2d), (2f), and (2g). When we exclude the country with the largest weight share outside of the donor pool and repeat the synthetic control method procedure for each comparison, results change the most for comparisons (2c), (2e) and (2h). In (2c) and (2e) the gap shrinks and in (2h) it widens. In comparison (2c) leaving Upper-Carniola (with 78,2% weightage) as a high-leverage donor out of the donor pool creates a substantially smaller gap (6%) in end of sample GDP per capita, than if we allow Upper-Carniola to be a part of the donor pool. Next difference in results after altering the composition of the synthetic region occurs in comparison (2e) in which we compare Slovenian Carinthia to the rest of the world. It seems that when leaving Austria out of the donor pool results weaken. At the beginning Slovenian Carinthia is developing better than synthetic Slovenian Carinthia 'which joined Austria'' and synthetic Slovenian Carinthia only recovers at the end (-3% gap). It seems like results for comparison (2e) are only somewhat robust. However, given that comparison (2f) which already excludes Austria and Hungary from the donor pool before the leave-one-out analysis demonstrates long-run robustness of results, along with results from region-level comparison, I can conclude that the effect of joining Austria for Slovenian Carinthia is positive regardless of whether comparison (2e) is robust or not. In comparison (2h) the gap widens and actual Slovenian Carinthia develops significantly worse than in the possible counterfactual scenario.

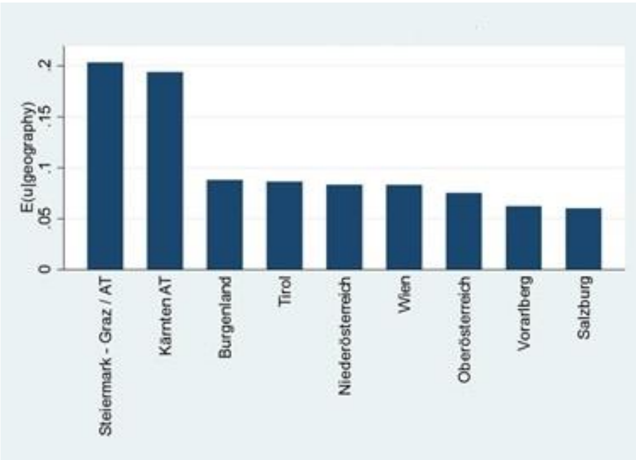
4 DRIVERS OF GROWTH

There are various transmission channels through which integration into institutional regimes can change economic growth, which are well explained in the literature. These transmission mechanisms include institutional quality, access to the internal market, knowledge transfer, access to finance and access to the external market.

In the introduction, I put forward the following hypothesis regarding drivers of growth: 'The quality of institutions plays a role in explaining the difference in economic growth between Slovenian and Austrian Carinthia.' As in Maseland and Spruk (2020b) I wanted to calculate the institutional quality residuals for Austrian and Slovenian Carinthia with Polity5 data to assess this hypothesis. However, this could not be assessed because in my thesis we have a single treated state (as opposed to multiple treated states in Maseland and Spruk (2020b)). With Slovenian and Austrian Carinthia there is not enough variation to aggregate the effect and transmission channels.

Nevertheless, we can estimate regional institutional quality by residualizing target variables. In a nutshell, we are trying to explain the country-level institutional quality by local geographical characteristics (mostly exogenous variables) and with it obtain a residual component at the level of regions. Figure 4 exhibits such residuals for Austrian federal states using V-DEM index of liberal democracy (Coppedge et al., 2021) as the target variable. It turns out that for Austrian federal states Austrian Styria and Austrian Carinthia are the biggest beneficiaries of the Austrian institutional framework. They have a high residual component compared to other federal states, which means that given the plausible counterfactual scenario they enjoy an institutional premium that they themselves or as part of another institutional regime would not have. The federal state in Austria with zero residual is Salzburg, which means that Austria as a whole has an institutional framework that could realistically be expected in a geographical environment like Salzburg.

Figure 4: Institutional quality residual



Source: Spruk (2021).

Even though Figure 4 does not give a definite causal inference it does imply that institutional framework of Austrian Carinthia is better than given possible counterfactual scenario. This suggests that the institutional framework may play a role in explaining some part of the growth premia for Austrian Carinthia occurred by joining Austria.

CONCLUSION

This thesis has attempted to quantify the impacts of Carinthian Plebiscite. Applying the synthetic control method to build counterfactuals I was able to comment on the growth hypotheses set out in the introduction. I was able to show that by virtue of plebiscite vote for Austria, Austrian Carinthia has an improved growth trajectory relative to the possible counterfactual scenario. Additionally, because of institutional stability enjoyed by Austria, Austrian Carinthia avoided Yugoslav war and is today much richer in per capita GDP terms. For Slovenian Carinthia results of the synthetic control method suggests joining Yugoslavia entailed a sequence of bad institutional choices that cumulatively imposed a high penalty, which would be much less likely to materialize had the region been linked with Austria after World War 1. Results suggest that Slovenian Carinthia could avoid all the instability and institutional pitfalls that Yugoslavia had by joining Austria. There are several possible causes of growth deficits for Slovenian Carinthia and growth surpluses for Austrian Carinthia, as there are different transmission channels through which integration into institutional regimes can change economic growth. These transfer mechanisms include institutional quality, access to the internal market, knowledge transfer, access to finance and access to the external market.

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APPENDICES

Appendix 1: Summary in Slovene Language/Povzetek v slovenskem jeziku

V tej diplomski nalogi z naslovom "Dolgoročni vpliv koroškega plebiscita na gospodarsko rast" sem poskušala količinsko opredeliti vplive koroškega plebiscita na dolgoročno rast avstrijske in slovenske Koroške.

Koroški plebiscit je determiniral del državnih meja med Avstrijo in Slovenijo in prej (zgodovinsko) celovito regijo Koroško razdelil na dva dela. Poleg tega je plebiscit služil kot fundamentalni eksogeni šok, ki je regijo izpostavil dvema različnima institucionalnima režimoma. Manjši, južni del Koroške je bil v skladu s pogodbo v Saint Germainu samodejno dodeljen Jugoslaviji (Sloveniji). V večjem severnem delu Koroške, pa so imeli državljani možnost samoodločbe na plebiscitu leta 1920, kjer je za priključitev Avstriji glasovalo 59,1% volilnih upravičencev, za priključitev Jugoslaviji pa 40,9%. V nalogi sem se osredotočila na ekonomske posledice te odločitve in v uvodu oblikovala tri hipoteze:

1) Dolgoročno je avstrijska Koroška zaradi izpostavljenosti avstrijskemu institucionalnemu režimu dosegla višjo raven BDP na prebivalca.
2) Slovenska Koroška bi lahko dolgoročno imela višji BDP na prebivalca, če bi lahko sodelovala na plebiscitu in postala del avstrijskega institucionalnega režima.
3) Kakovost institucij igra vlogo pri razlagi razlike v gospodarski rasti med slovensko in avstrijsko Koroško.

Z uporabo metode sintetične kontrole, s katero sem izračunala učinke možnih nasprotnih scenarijev, sem lahko komentirala hipoteze o rasti. Rezultati so pokazali, da ima avstrijska Koroška zaradi plebiscitnega glasovanja za Avstrijo precej izboljšano trajektorijo rasti glede na možen nasprotni scenarij priključitve Jugoslaviji. Poleg tega se je avstrijska Koroška zaradi institucionalne stabilnosti, ki jo uživa Avstrija, izognila jugoslovanski vojni in je danes (merjeno v BDP na prebivalca) veliko bogatejša. Za slovensko Koroško rezultati metode sintetične kontrole kažejo, da bi se lahko izognila vsem nestabilnostim in institucionalnim pastem, ki jih je imela Jugoslavija s pridružitvijo Avstriji. Pripojitev Jugoslaviji je pomenila vrsto slabih institucionalnih odločitev, ki so se kumulativno seštele v visok primanjkljaj potencialne rasti, ki bi se manj verjetno materializiral, če bi regija po 1. svetovni vojni pripadla Avstriji. Možnih vzrokov primanjkljajev v rasti za slovensko Koroško in presežkov v rasti za avstrijsko Koroško je več, saj obstajajo različni kanali prenosa, po katerih lahko vključevanje v institucionalne režime spremeni gospodarsko rast. Ti mehanizmi prenosa vključujejo institucionalno kakovost, dostop do notranjega trga, prenos znanja, dostop do financ in dostop do zunanjega trga.

Appendix 2: Tables and figures

Table 1: Descriptive statistics

	Observations	Mean	Std. Dev.	Min	Max
a) Dependent variable					
(1) Log GDP per capita	35868	8.31	1.13	5.52	11.12
(2) GDP per capita	35868	7574.28	9077.03	249.31	67832.6
b) Past GDP dynamics covariates					
(1) Log GDP per capita in 1870	244	7.01	0.57	5.55	8.44
(1) Log GDP per capita in 1900	244	7.47	0.62	5.79	8.93
(1) Log GDP per capita in 1910	244	7.69	0.65	5.86	9.14
(1) Log GDP per capita in 1920	244	7.73	0.67	6.11	9.27
(1) Log GDP per capita (t-1)	35624	8.31	1.13	5.52	11.12
(2) GDP per capita in 1870	244	1297.97	764.77	258.08	4636.49
(2) GDP per capita in 1900	244	2087.83	1242.91	327.63	7556.88
(2) GDP per capita in 1910	244	2632.70	1537.93	349.34	9361.5
(2) GDP per capita in 1920	244	2749.49	1745.97	448.84	10647.6
c) Physical geography covariates					
Temperature (in °F)	35868	52.81	9.48	32.90	83.50
Rainfall	35868	34.47	16.97	0.09	109.57
Sunshine	35868	2353.36	521.16	1265	3972
Latitude	35868	29.47	26.82	-54.80	64.48
Longitude	35868	-33.45	63.01	-155.66	171.48
Desert	35868	0.15	0.35	0	1
Island	35868	0.05	0.22	0	1
Landlocked	35868	0.38	0.48	0	1
Area	35868	139146.9	463515.8	68.34	3900000
d) Legal covariates					
British common law	35868	0.35	0.48	0	1
French civil law	35868	0.44	0.50	0	1
German Civil law	35868	0.20	0.40	0	1
Scandinavian Civil law	35868	0.02	0.13	0	1

Note: In b) Past GDP dynamics, covariates denoted by (1) are employed in comparisons, which use log GDP per capita as the dependent variable and covariates marked by (2) are utilized in models with GDP per capita as the dependent variable.

Source: Own work.

Table 2: Covariate Balance Austrian Carinthia with (1) log GDP per capita as dependent variable

Covariate Balance for Austrian Carinthia

	(1a)		(1b)		(1c)		(1d)	
RMSPE	0.0992		0.1035		0.0974		0.0507	
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic
Log gdp per capita in 1870	7.15	7.13	7.15	7.00	7.15	6.87	7.15	7.06
Log gdp per capita in 1900	7.48	7.47	7.48	7.47	7.48	7.42	7.48	7.42
Log gdp per capita in 1910	7.62	7.57	7.62	7.66	7.62	7.57	7.62	7.57
Log gdp per capita in 1920	7.25	7.42	7.25	7.48	7.25	7.63	7.25	7.36
Log gdp per capita (t-1)	8.17	8.18	8.17	8.38	8.17	8.04	8.17	8.01
Log gdp per capita (t-2)	/	/	/	/	/	/	7.96	8.03
Latitude	46.72	43.69	46.72	45.76	46.72	45.70	46.72	40.75
Longitude	14.18	23.47	14.18	5.18	14.18	14.76	14.18	-22.57
Log area	9.16	11.52	9.16	8.87	9.16	7.83	9.16	8.33
British common law	/	/	/	/	/	/	/	/
French civil law	/	/	/	/	/	/	/	/
German civil law	1	0.41	1	0.42	1	0.78	1	/
Scandinavian civil law	/	/	/	/	/	/	/	/
Island	0	0.04	0	0	0	/	0	/
Landlocked	1	0.41	1	0.07	1	0.78	1	0.41

Source: Own work.

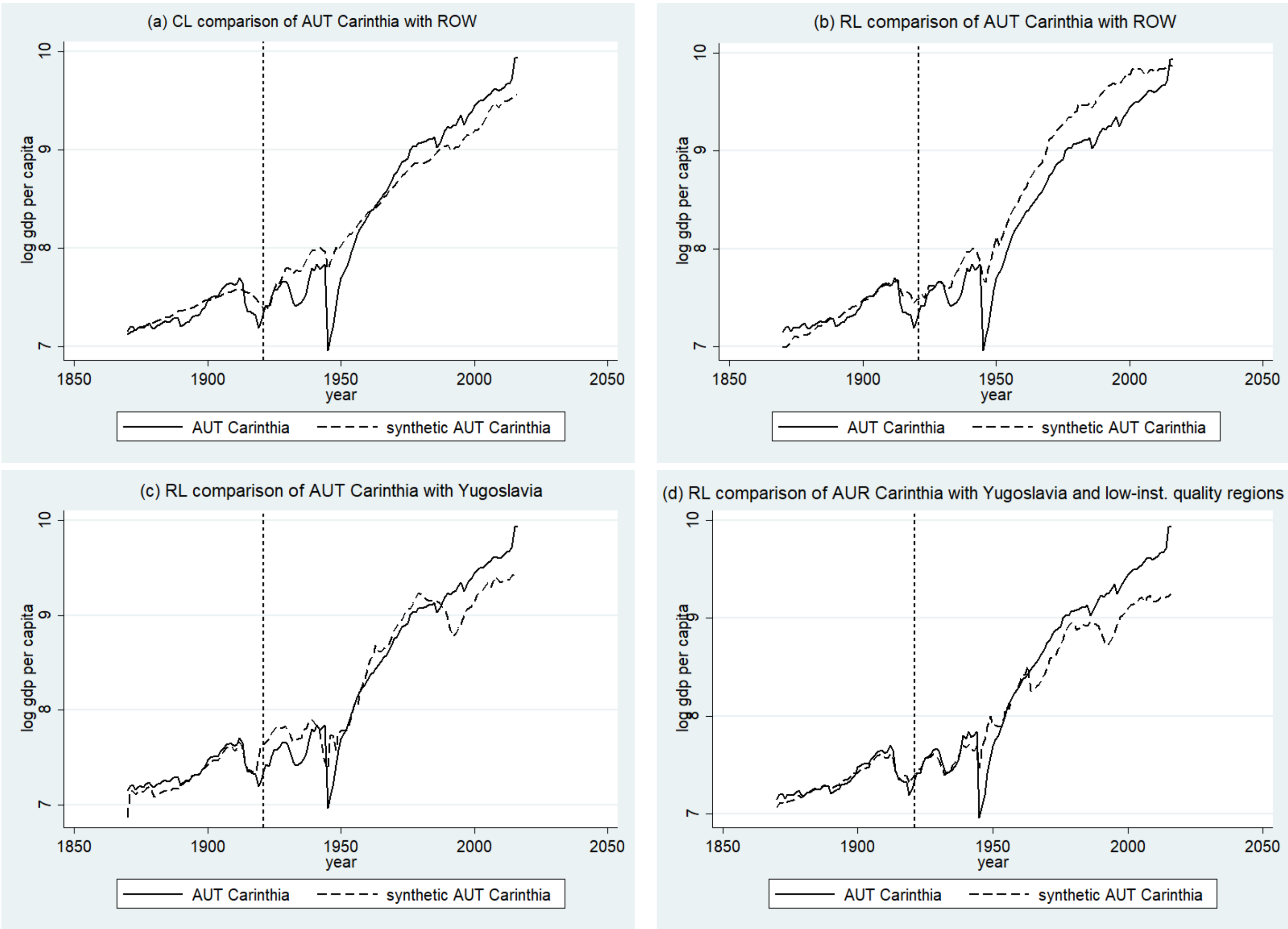
Table 3: Covariate Balance for Austrian Carinthia with (3) GDP per capita as dependent variable

Covariate Balance for Austrian Carinthia

	(2a)		(2b)		(2c)		(2d)	
RMSPE	171.9715		150.5023		163.5269		118.398	
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic
Gdp per capita in 1870	1278.11	1230.84	1278.11	1012.01	1278.11	961.52	1278.11	1137.571
Gdp per capita in 1900	1766.48	1781.14	1766.48	1784.76	1766.48	1654.096	1766.48	1659.904
Gdp per capita in 1910	2043.24	1985.82	2043.24	2103.81	2043.24	1926.11	2043.24	1975.06
Gdp per capita in 1920	1413.22	1758.11	1413.22	1713.10	1413.22	2154.598	1413.22	1739.051
Latitude	46.72	46.69	46.72	43.24	46.72	45.50	46.72	38.99
Longitude	14.18	20.06	14.18	-19.72	14.18	14.91	14.18	-3.17
Log area	9.16	11.17	9.16	8.89	9.16	7.89	9.16	8.19
German civil law	1	0.585	1	0.551	1	/	/	/
Island	0	0	0	0	0	/	/	/
Landlocked	1	0.585	1	0.037	1	0.71	1	0.387

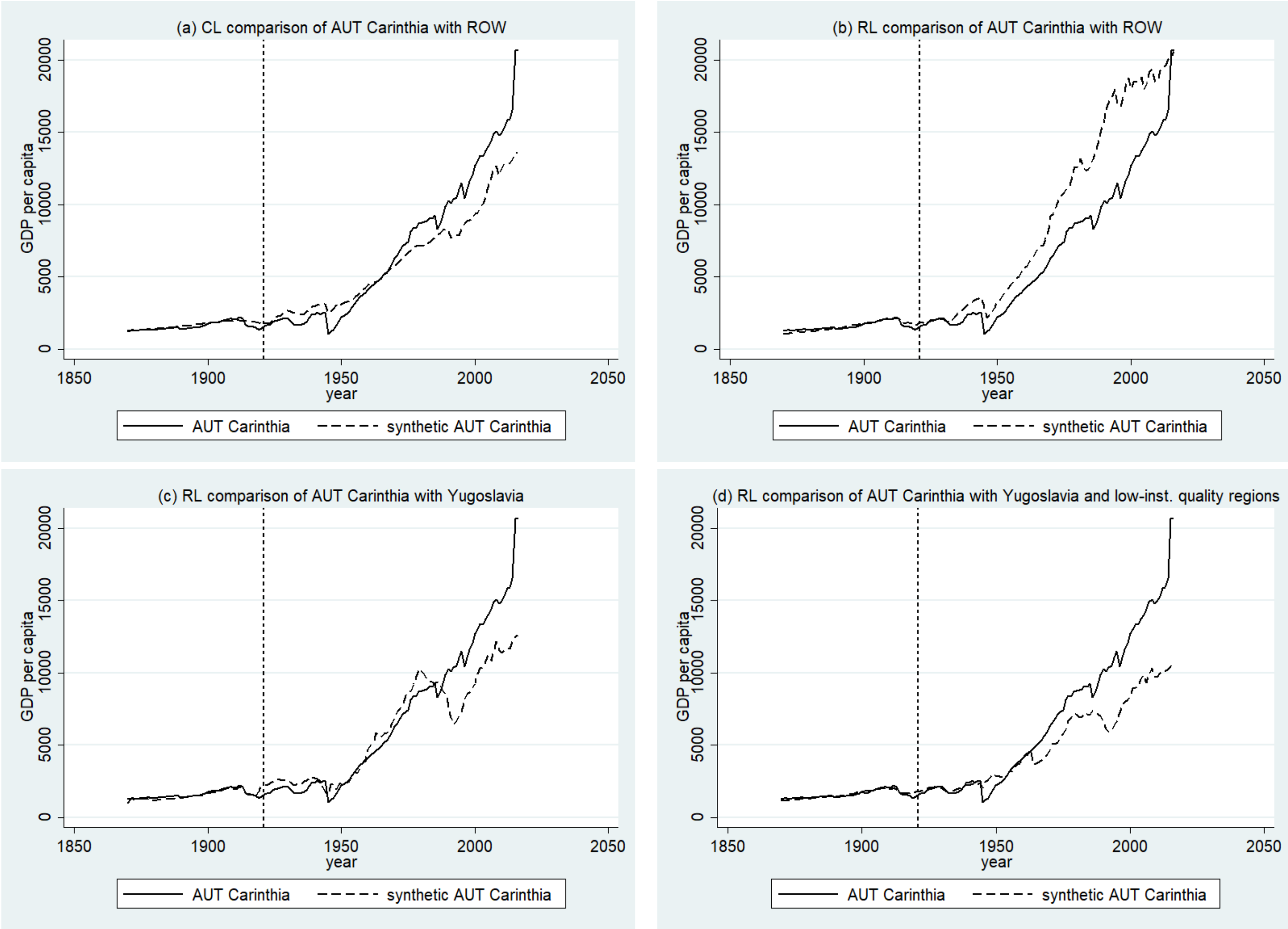
Source: Own work.

Figure 5:Comparison of AUT Carinthia with (1) log GDP per capita as dependent variable



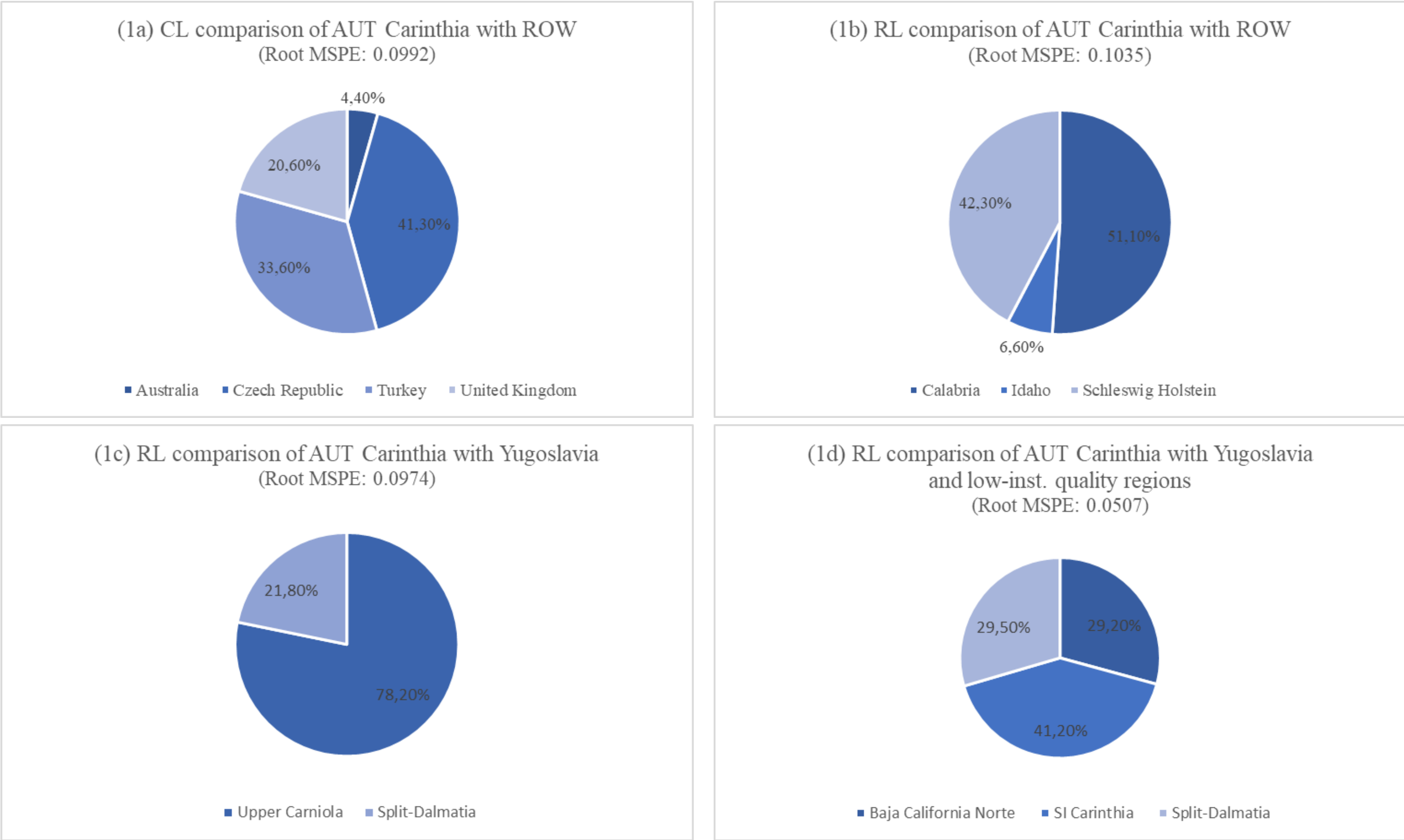
Source: Own work.

Figure 6: Comparison of AUT Carinthia with (2) GDP per capita as dependent variable



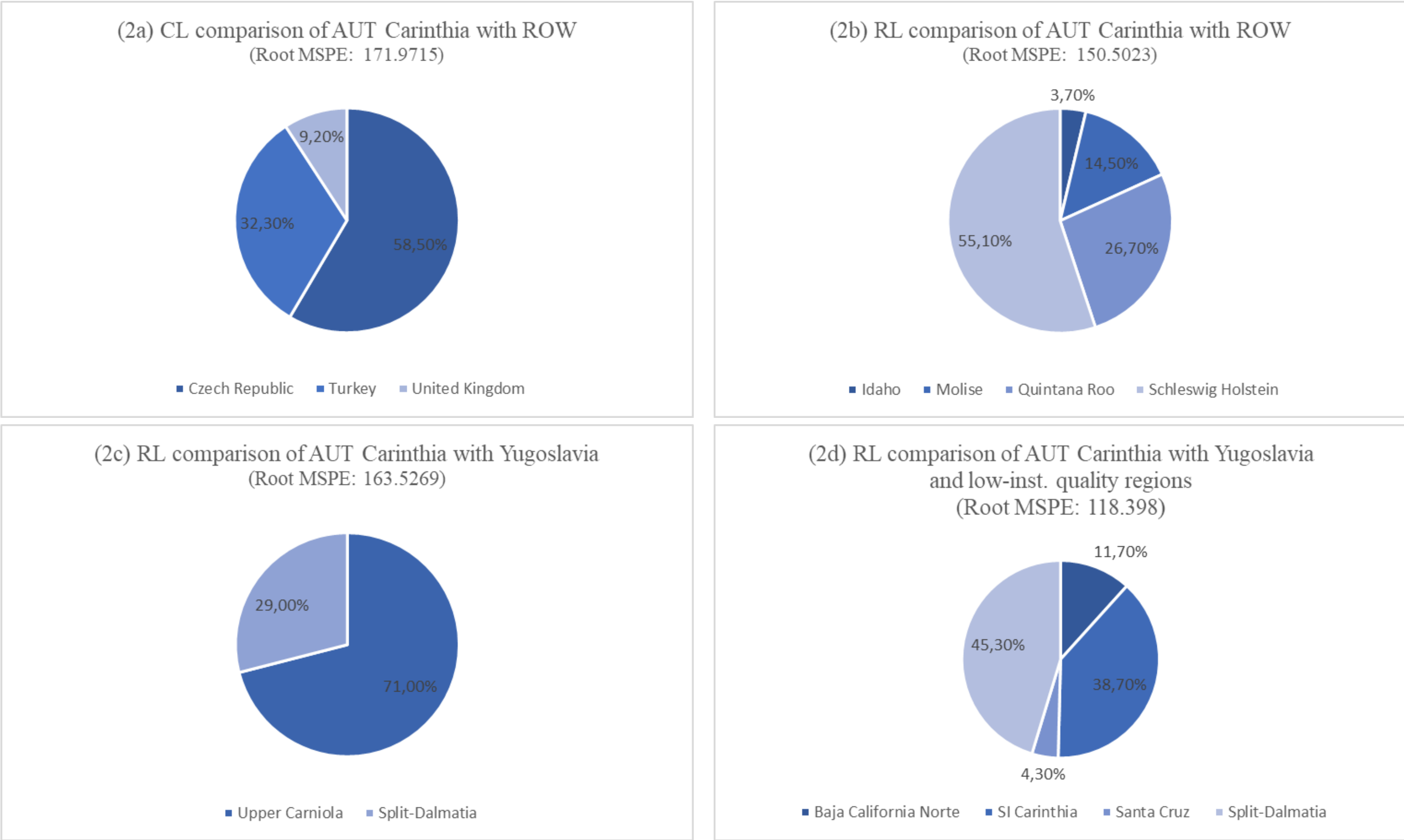
Source: Own work.

Figure 7: Composition of Synthetic Control Groups for AUT Carinthia with (1) log GDP per capita as dependent variable



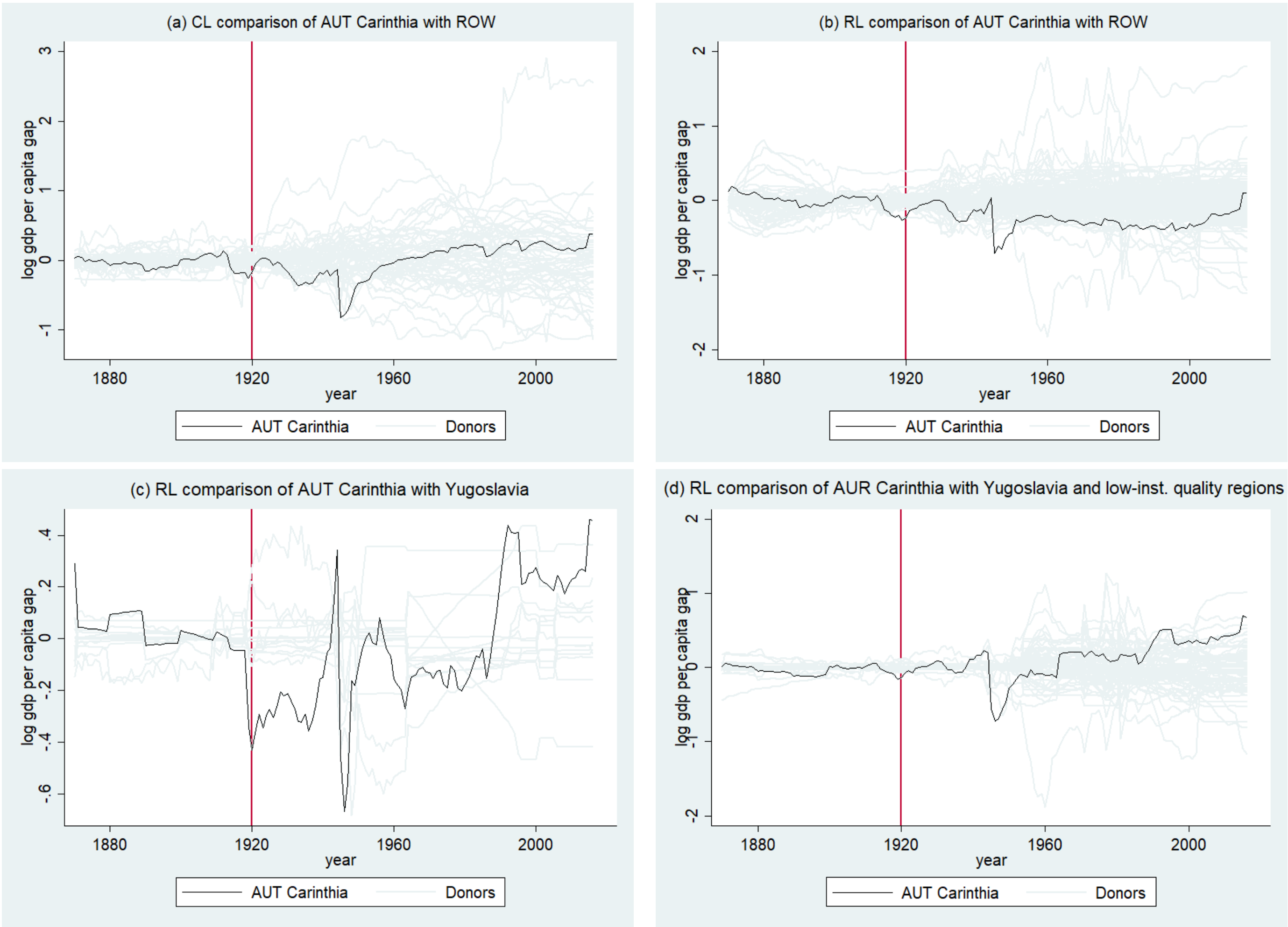
Source: Own work.

Figure 8: Composition of Synthetic Control Groups for AUT Carinthia with (2) GDP per capita as dependent variable



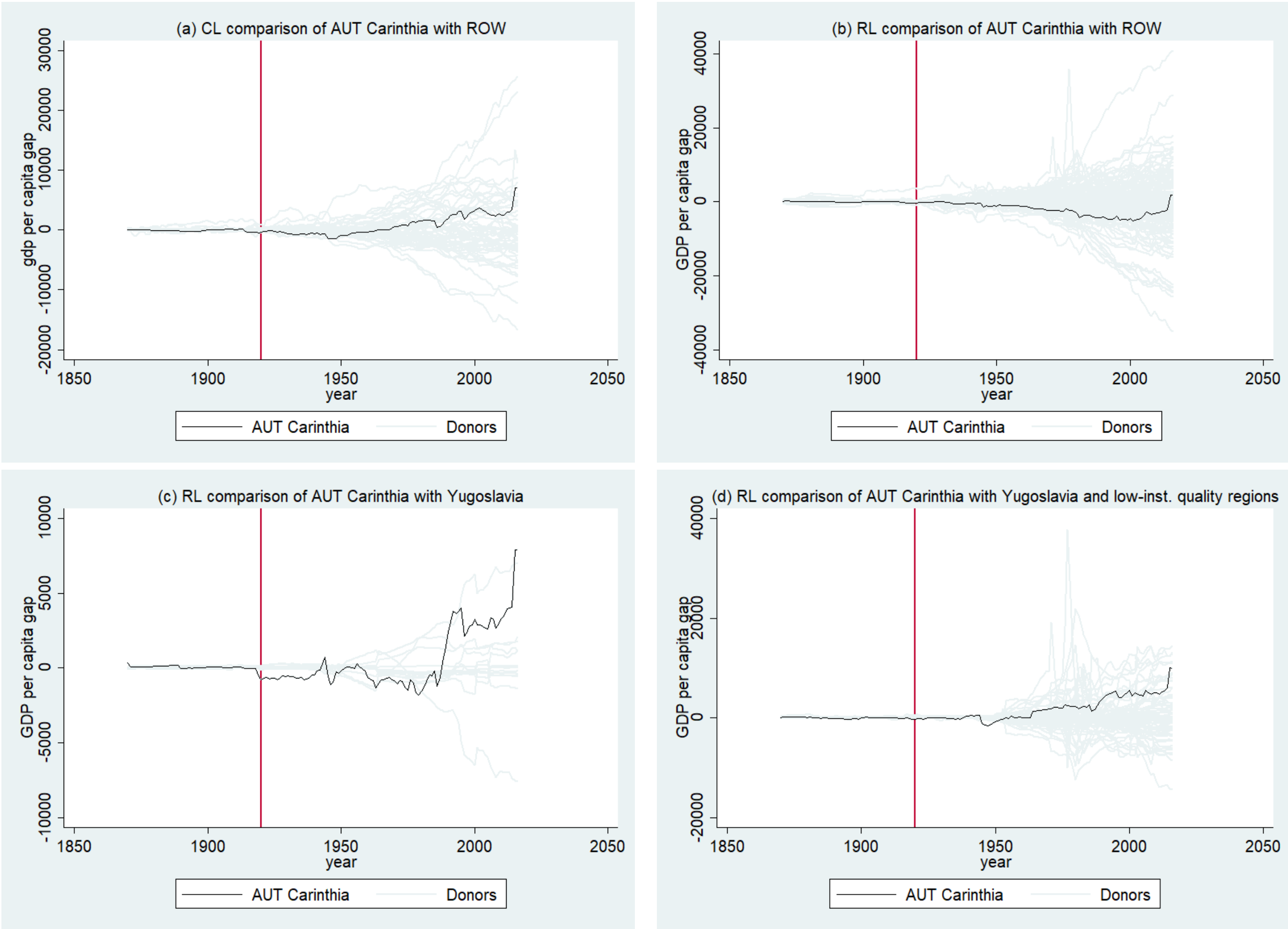
Source: Own work.

Figure 9: Placebo gaps for AUT Carinthia with (1) log GDP per capita as dependent variable



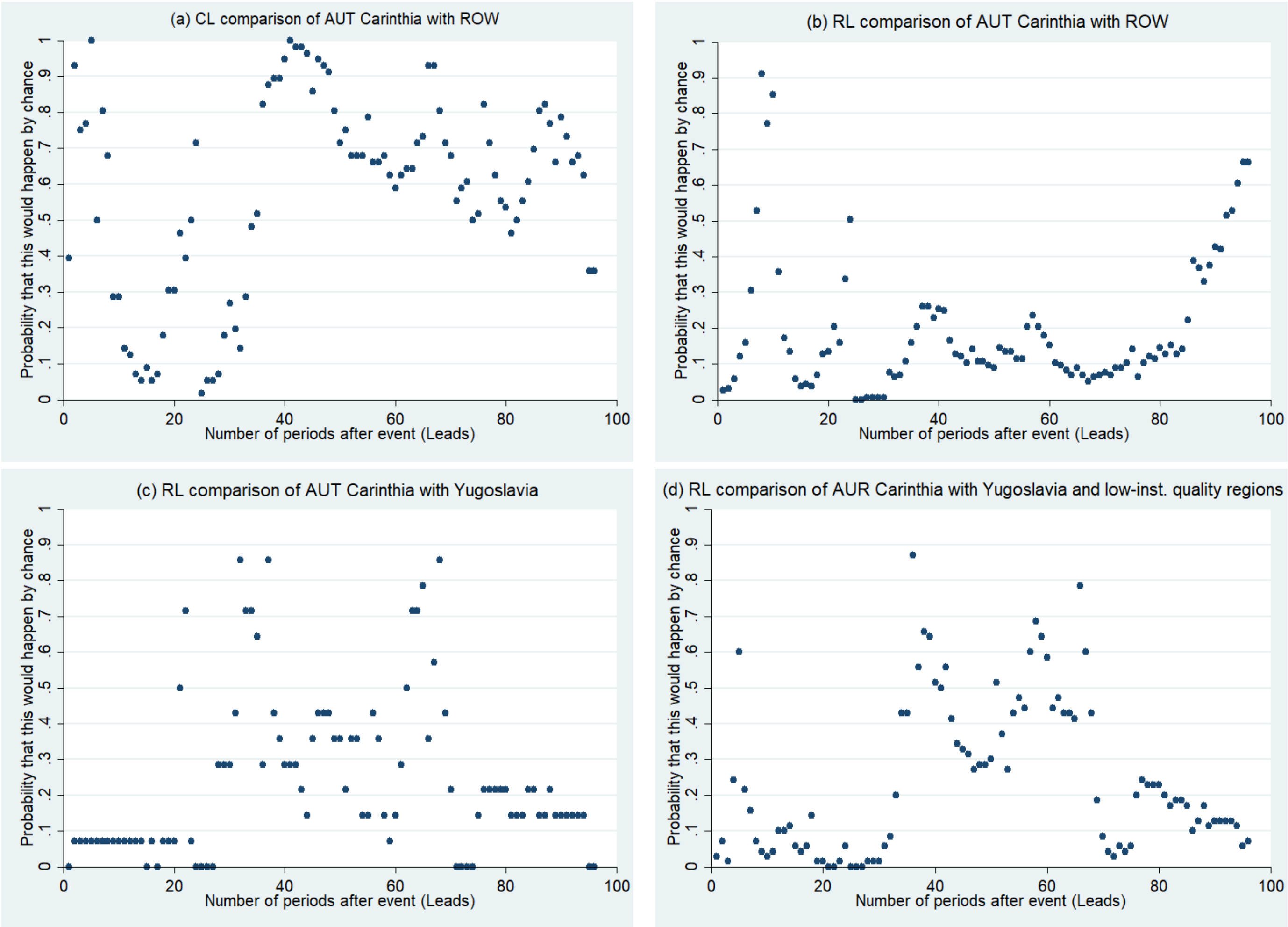
Source: Own work.

Figure 10: Placebo gaps for AUT Carinthia with (2) GDP per capita as dependent variable



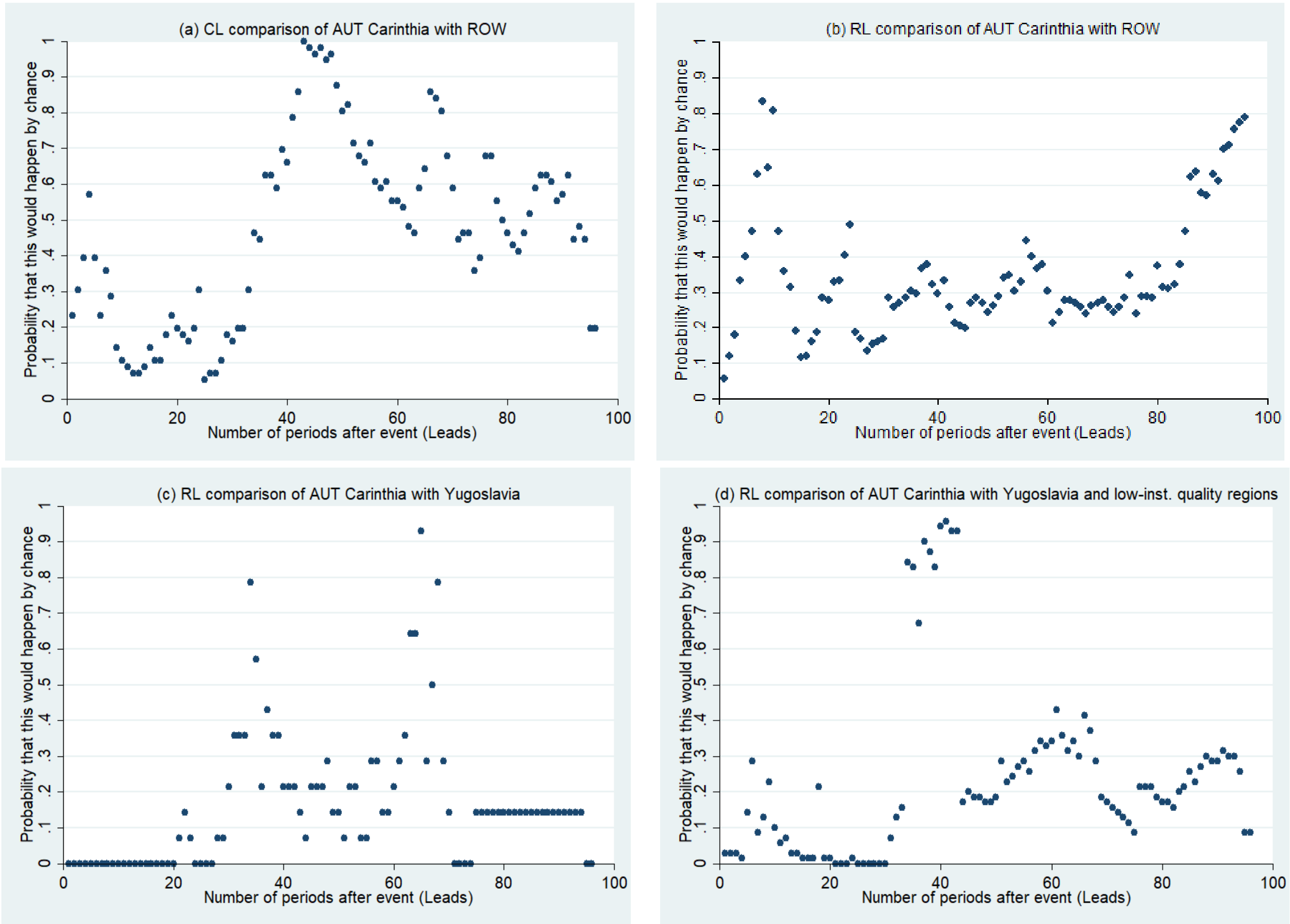
Source: Own work.

Figure 11: Randomization-Based Inference on Plebiscite Effects for AUT Carinthia with (1) log GDP per capita as dependent variable



Source: Own work.

Figure 12: Randomization-Based Inference on Plebiscite Effects for AUT Carinthia with (2) GDP per capita as dependent variable



Source: Own work.

Table 4: Covariate Balance Slovenian Carinthia with (1) log GDP per capita as dependent variable

Covariate Balance for Slovenian Carinthia

	(e)		(f)		(g)		(h)	
RMSPE	0.0739		0.0848		0.0499		0.1107	
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic
Log gdp per capita in 1870	6.66	6.70	6.66	6.70	6.66	6.66	6.66	6.58
Log gdp per capita in 1900	7.10	7.10	7.10	7.08	7.10	7.09	7.10	7.10
Log gdp per capita in 1910	7.26	7.22	7.26	7.18	7.26	7.25	7.26	7.30
Log gdp per capita in 1920	6.93	7.08	6.93	7.11	6.93	6.92	6.93	7.21
Log gdp per capita (t-1)	7.79	8.03	7.79	8.01	7.79	7.85	7.79	8.12
Latitude	46.50	44.64	46.50	46.05	46.50	45.92	46.50	39.01
Longitude	15.07	40.46	15.07	40.86	15.07	11.71	15.07	-17.35
Log area	6.95	10.50	6.95	11.94	6.95	7.41	6.95	8.50
British common law	0	0.02	0	0.03	/	/	/	/
French civil law	0	0.02	0	0.05	/	/	/	/
German civil law	1	0.958	1	0.92	1	0.98	1	0.28
Scandinavian civil law	0	0	0	0	0	/	0	/
Island	0	0	0	0	0	0	0	0
Landlocked	1	0.77	1	0.08	1	0.67	1	0

Source: Own work.

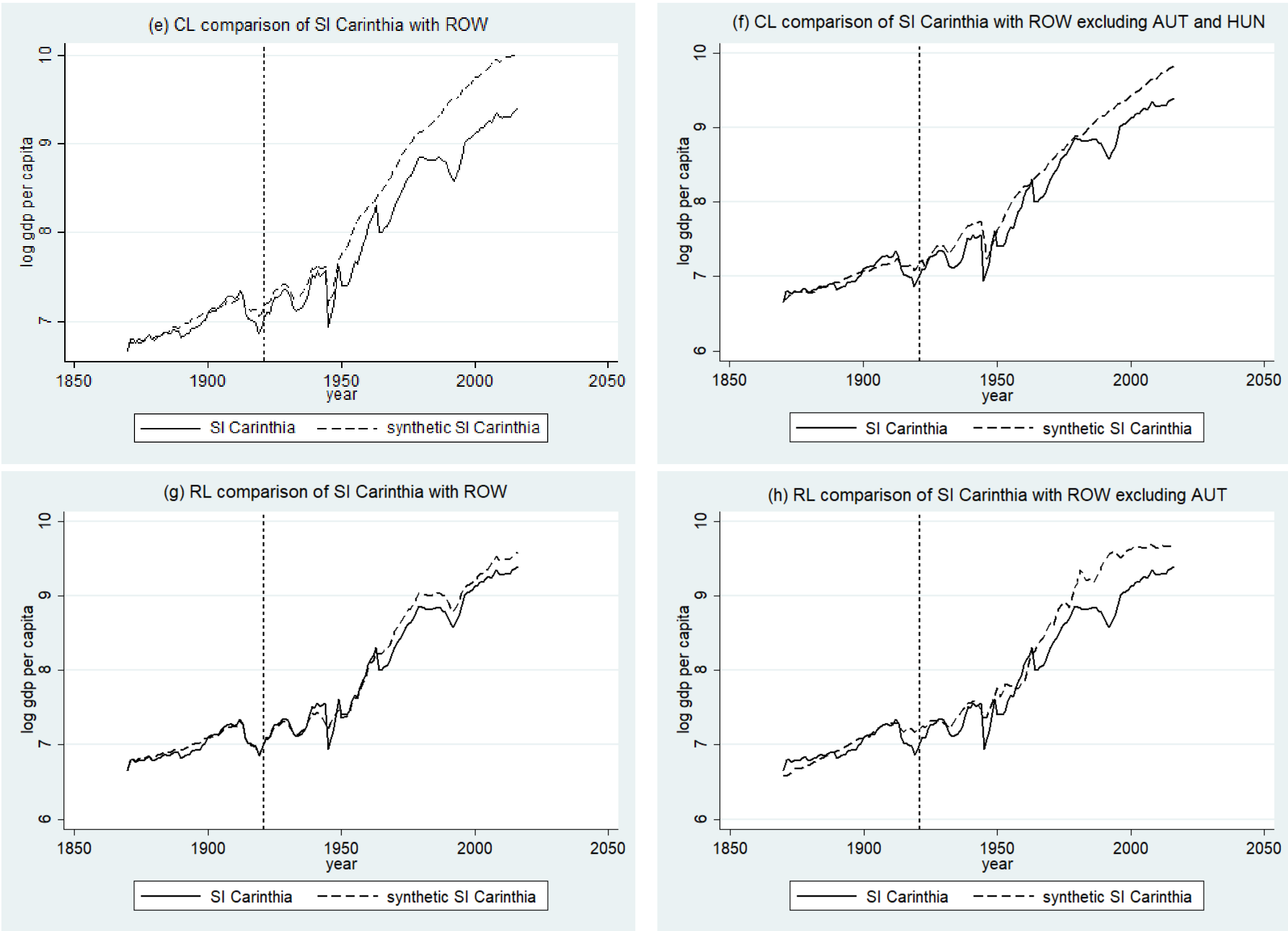
Table 5: Covariate Balance Slovenian Carinthia with (2) GDP per capita as dependent variable

Covariate Balance for Slovenian Carinthia

	(e)		(f)		(g)		(h)	
RMSPE	69.428		109.639		44.094		113.769	
	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic	Treated	Synthetic
Gdp per capita in 1870	780.66	796.95	780.66	804.36	780.66	790.89	780.66	650.24
Gdp per capita in 1900	1216.91	1211.65	1216.91	1180.01	1216.91	1217.91	1216.91	1236.84
Gdp per capita in 1910	1416.17	1376.49	1416.17	1342.25	1416.17	1410.86	1416.17	1483.59
Gdp per capita in 1920	1018.93	1130.03	1018.93	1263.60	1018.93	1024.31	1018.93	1282.17
Latitude	46.50	42.64	46.50	43.21	46.50	46.26	46.50	33.03
Longitude	15.07	57.16	15.07	62.69	15.07	14.07	15.07	-52.01
Log area	6.95	10.42	6.95	10.51	6.95	7.39	6.95	9.34
British common law	0	0.018	0	0.019	0	/	0	/
French civil law	0	0	0	0.011	0	/	0	/
German civil law	1	0.982	1	0.969	1	0.995	1	0.356
Scandinavian civil law	0	0	0	0	0	/	0	/
Island	0	0.018	0	0.019	0	0	0	0
Landlocked	1	0.59	1	0.46	1	0.731	1	0

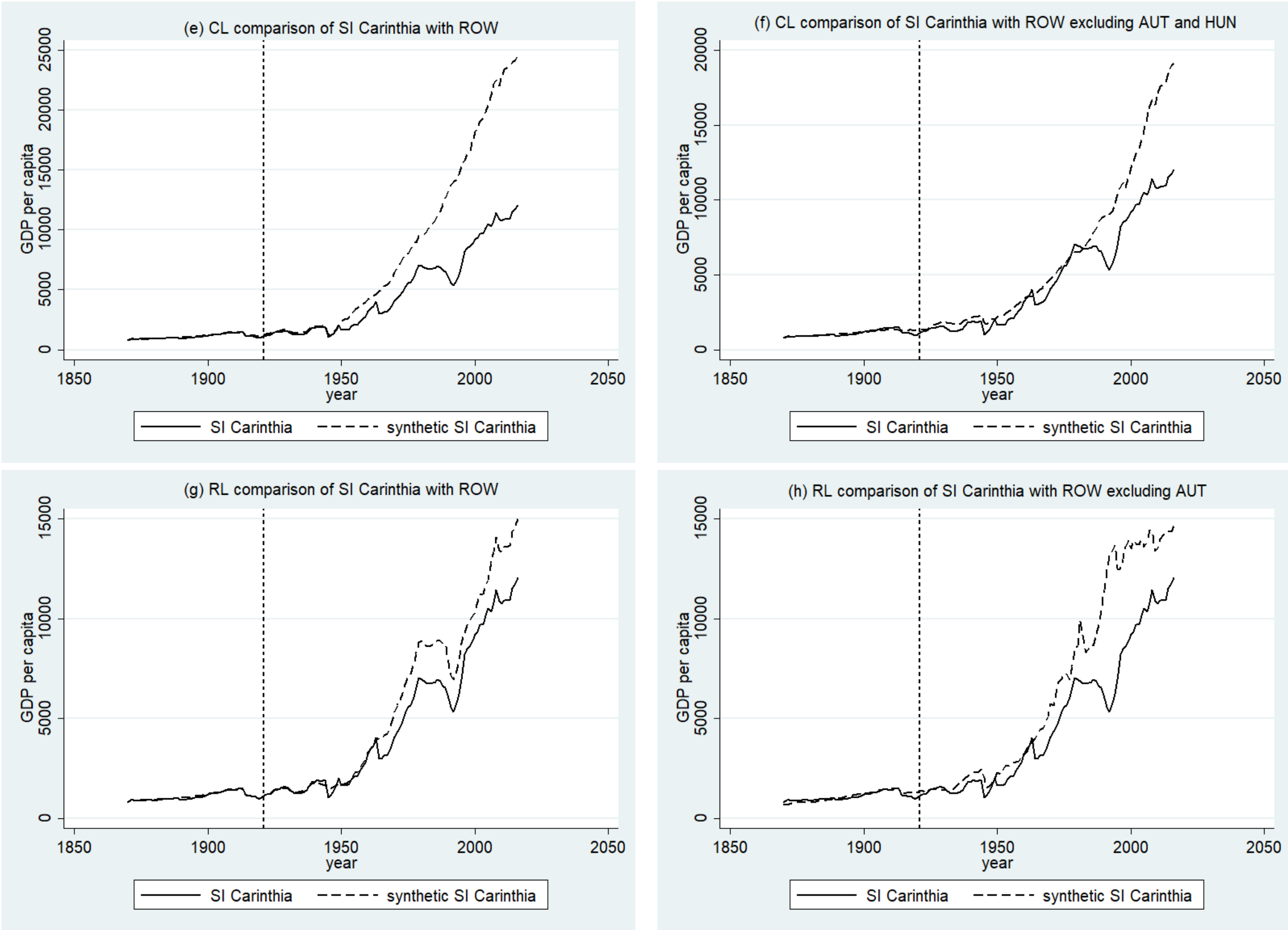
Source: Own work.

Figure 13: Comparison of SI Carinthia with (1) log GDP per capita as dependent variable



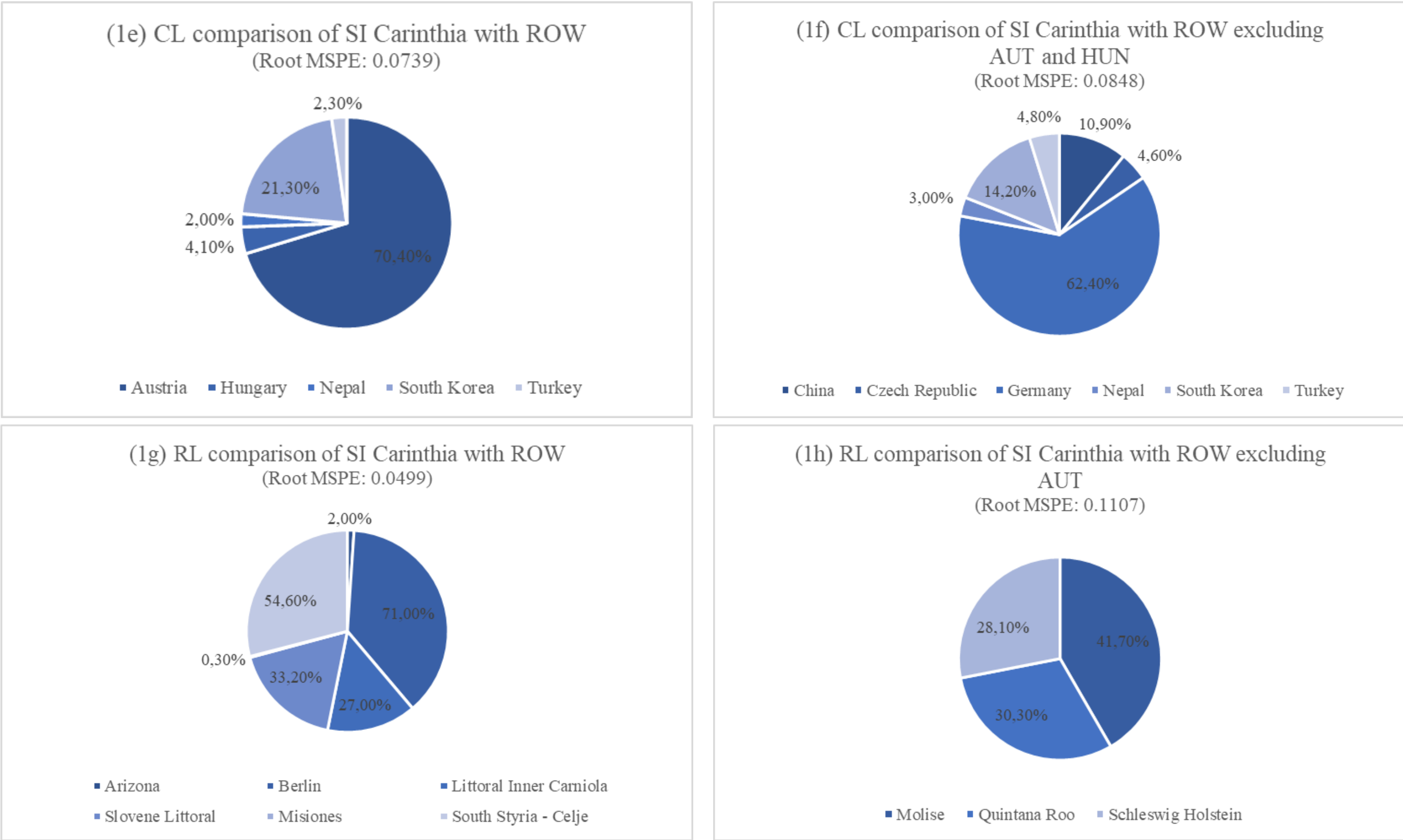
Source: Own work.

Figure 14: Comparison of SI Carinthia with (2) GDP per capita as dependent variable



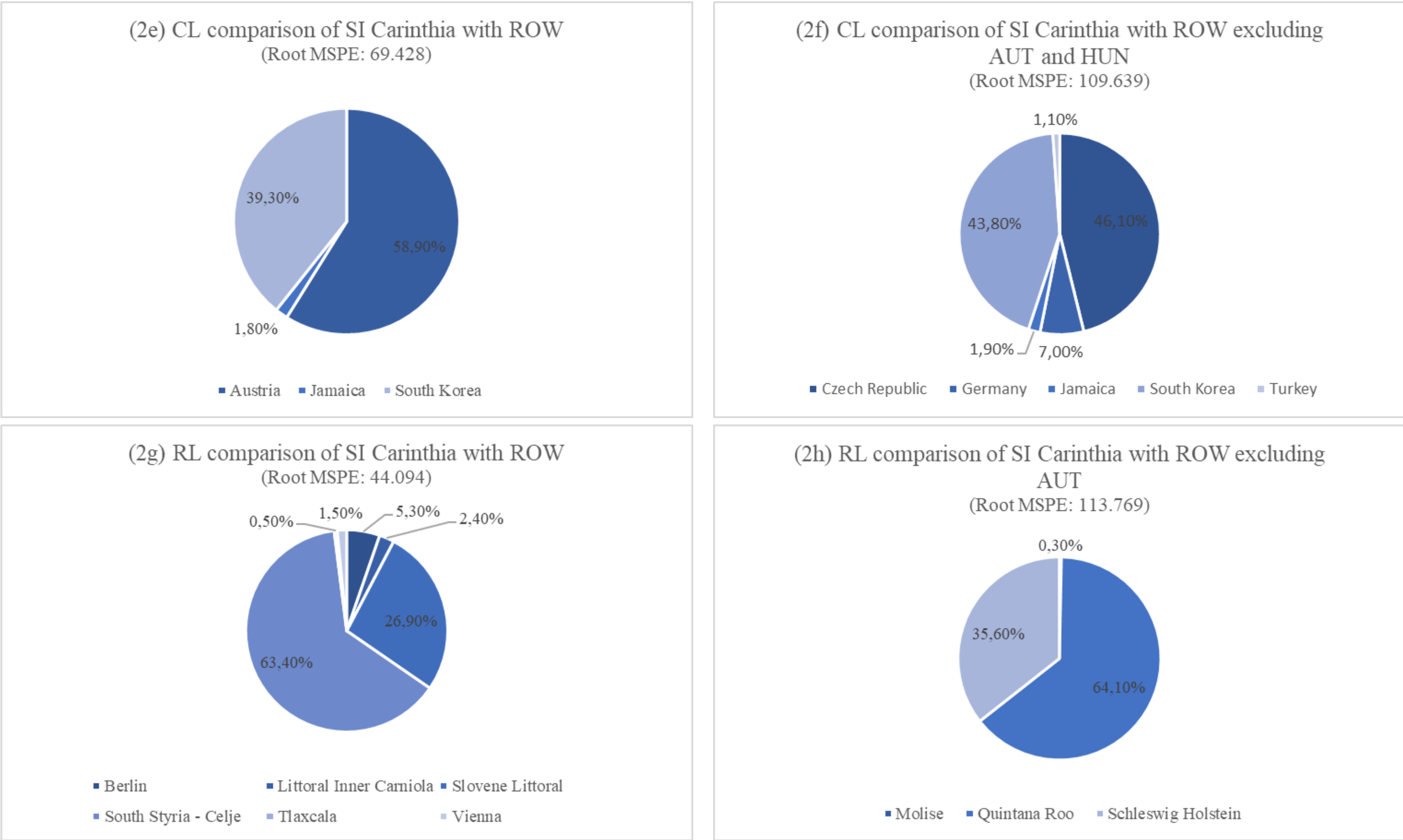
Source: Own work.

Figure 15: Composition of Synthetic Control Groups for SI Carinthia with (1) log GDP per capita as dependent variable



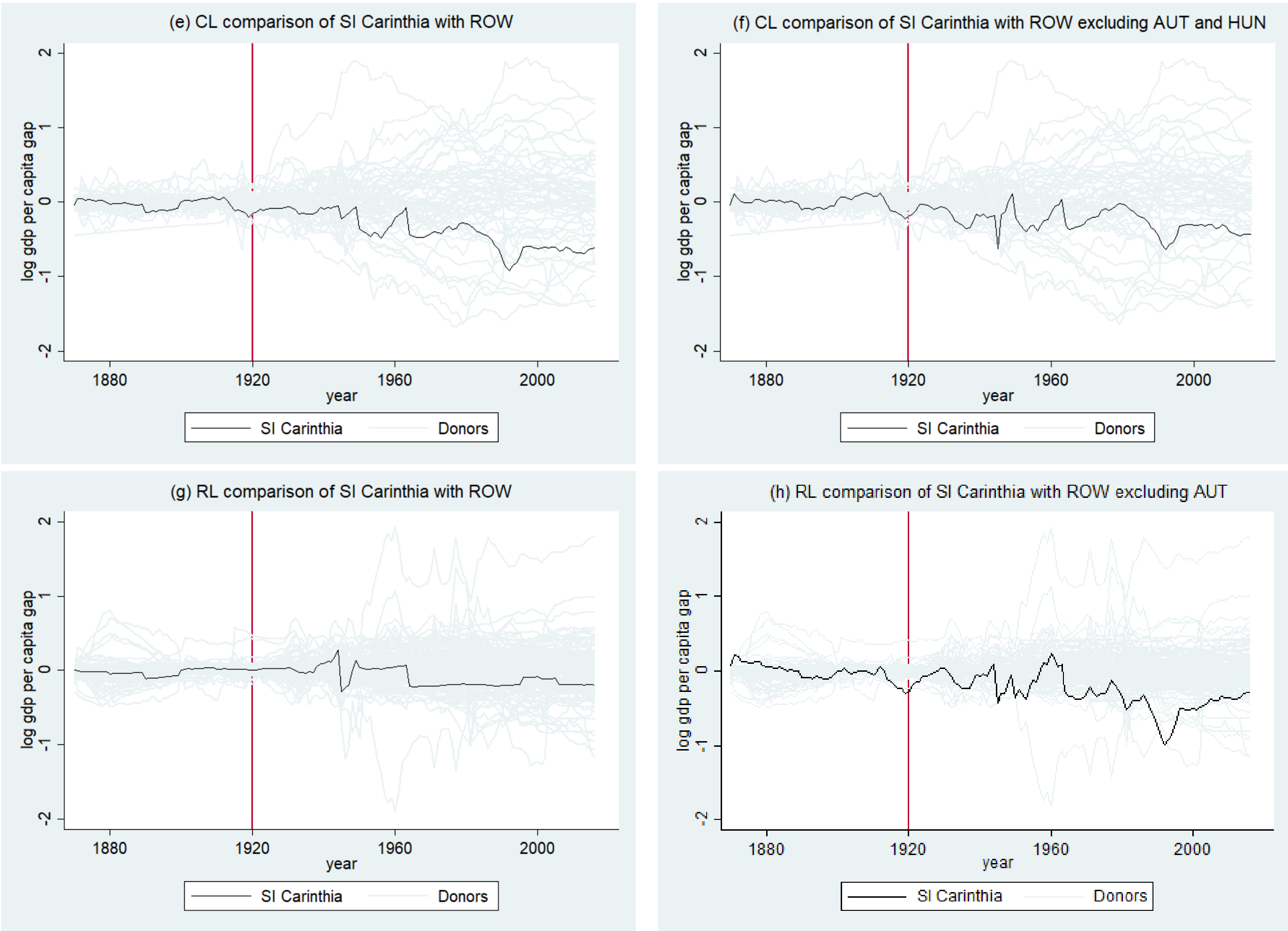
Source: Own work.

Figure 16: Composition of Synthetic Control Groups for SI Carinthia with (2) GDP per capita as dependent variable



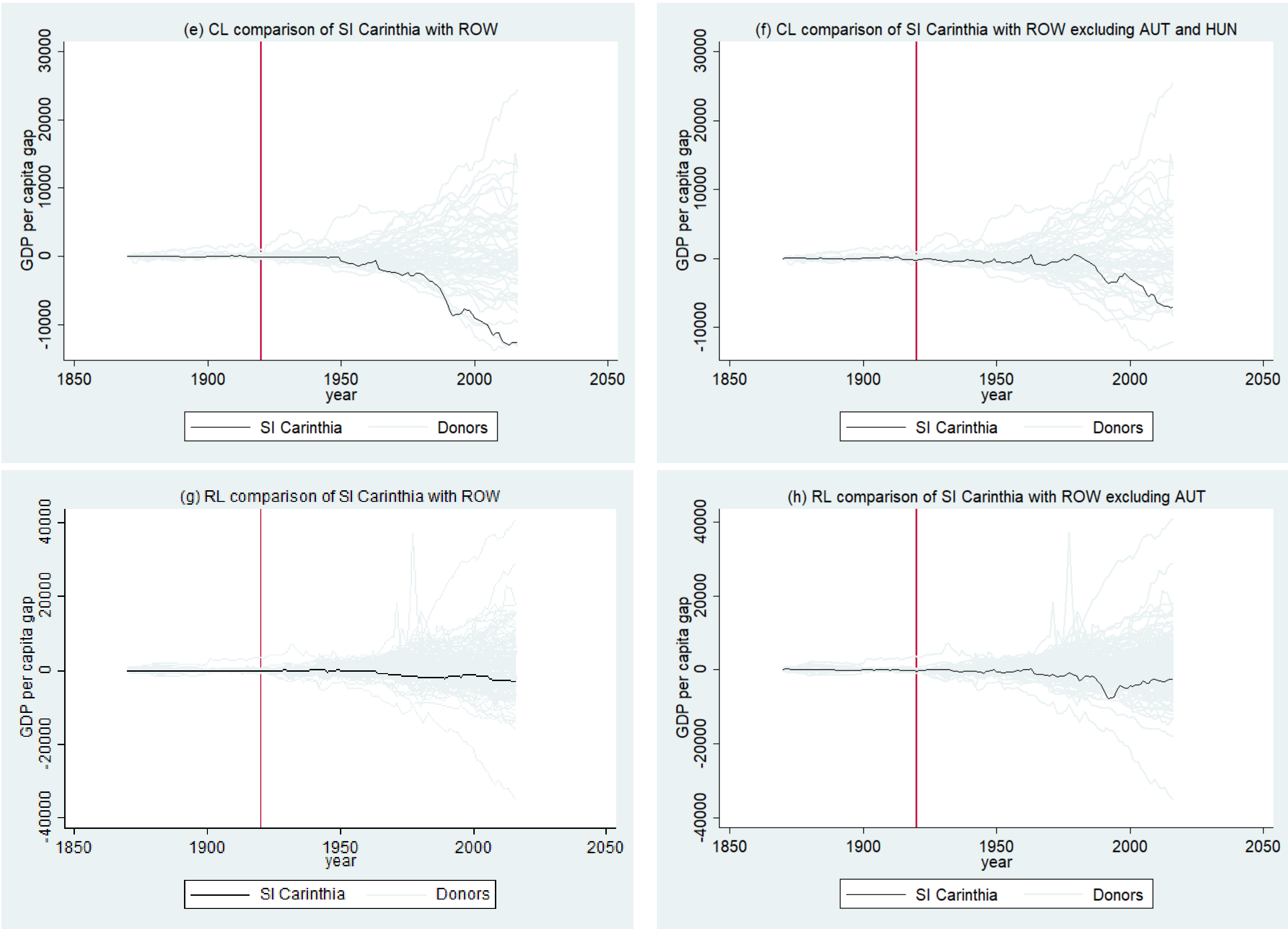
Source: Own work.

Figure 17: Placebo gaps for SI Carinthia with (1) log GDP per capita as dependent variable



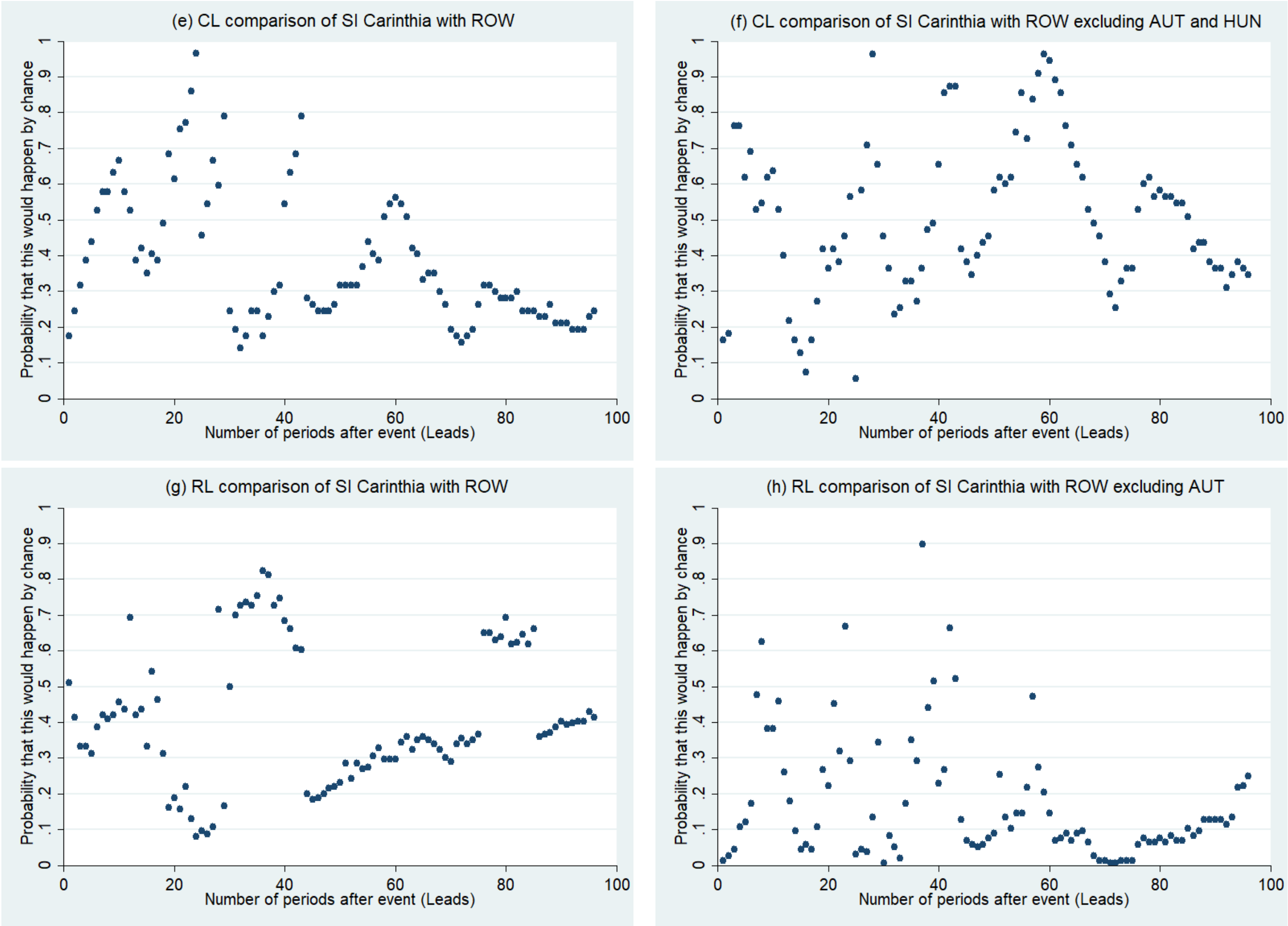
Source: Own work.

Figure 18: Placebo gaps for SI Carinthia with (2) GDP per capita as dependent variable



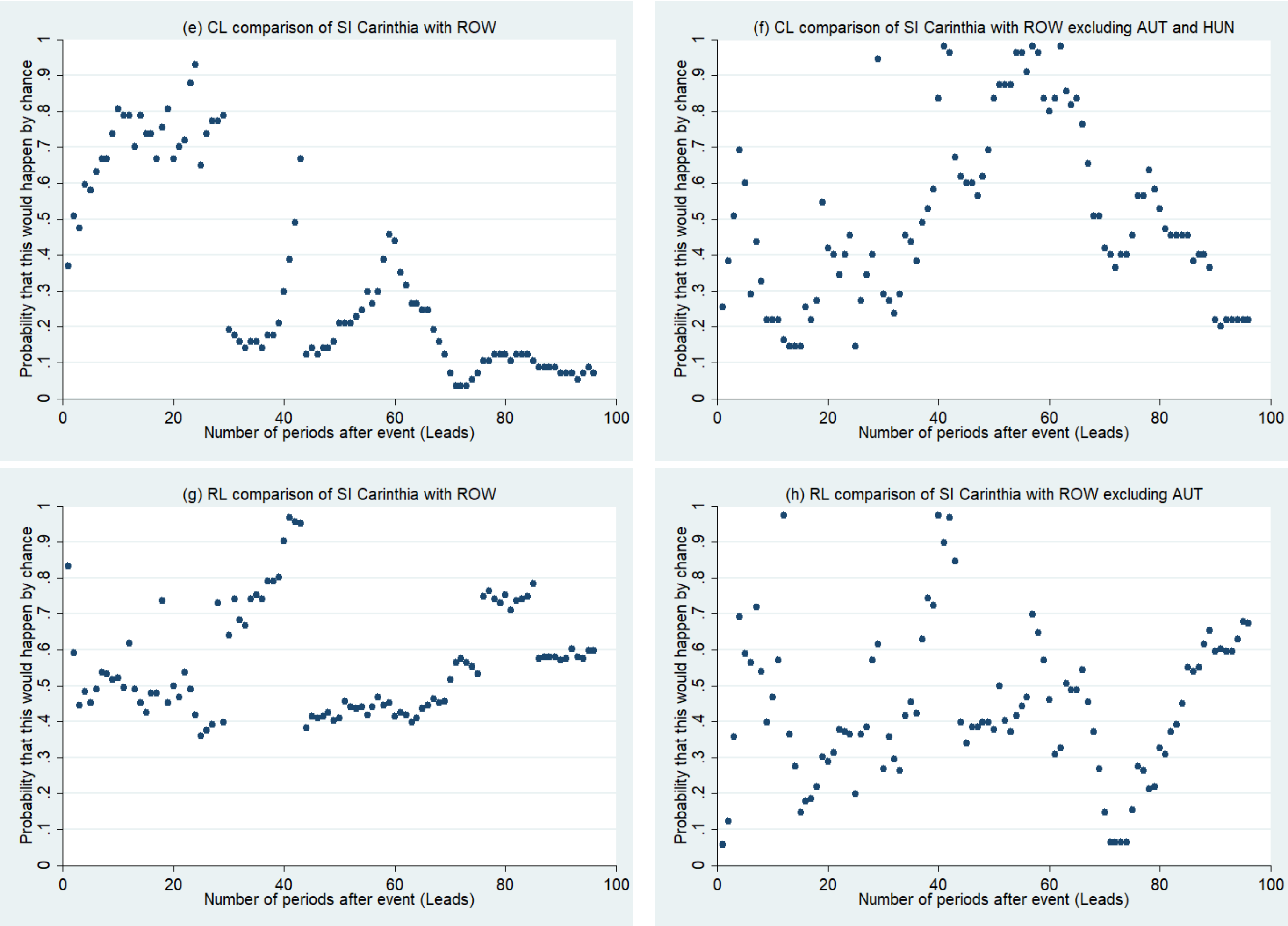
Source: Own work.

Figure 19: Randomization-Based Inference on Plebiscite Effects for SI Carinthia with (1) log GDP per capita as dependent variable



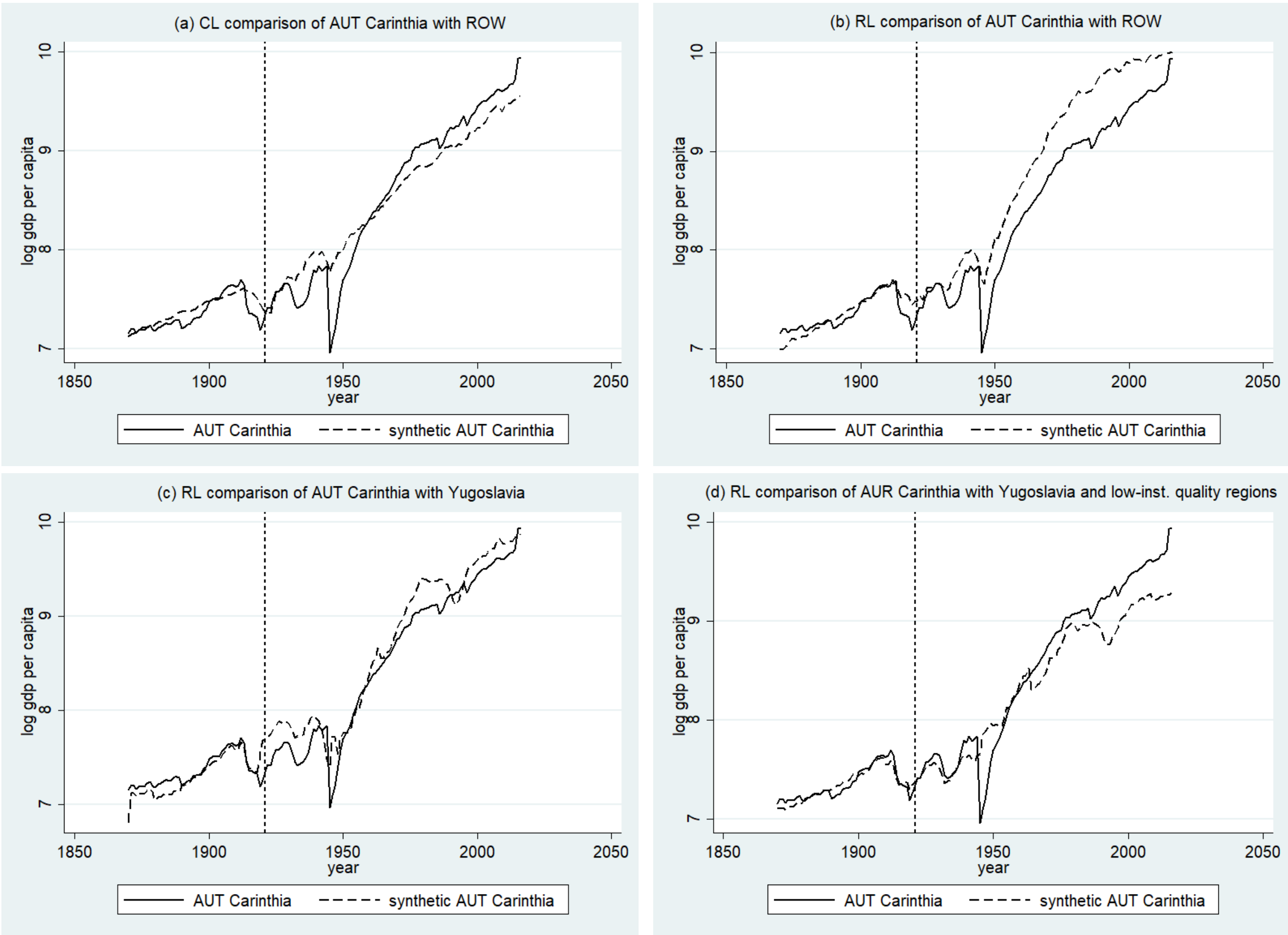
Source: Own work.

Figure 20: Randomization-Based Inference on Plebiscite Effects for SI Carinthia with (2) GDP per capita as dependent variable



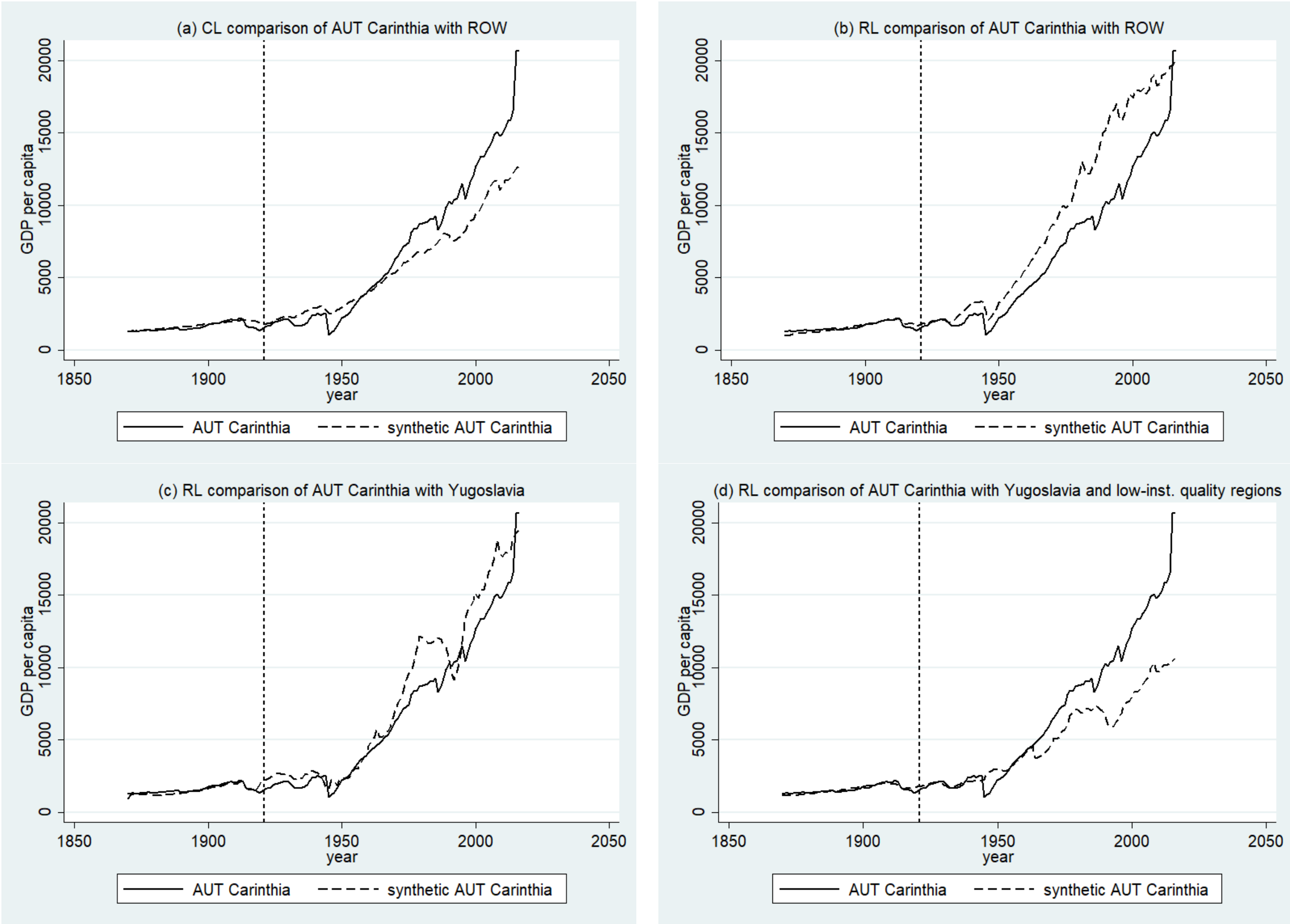
Source: Own work.

Figure 21: Leave one out analysis for AUT Carinthia with (1) log GDP per capita as dependent variable



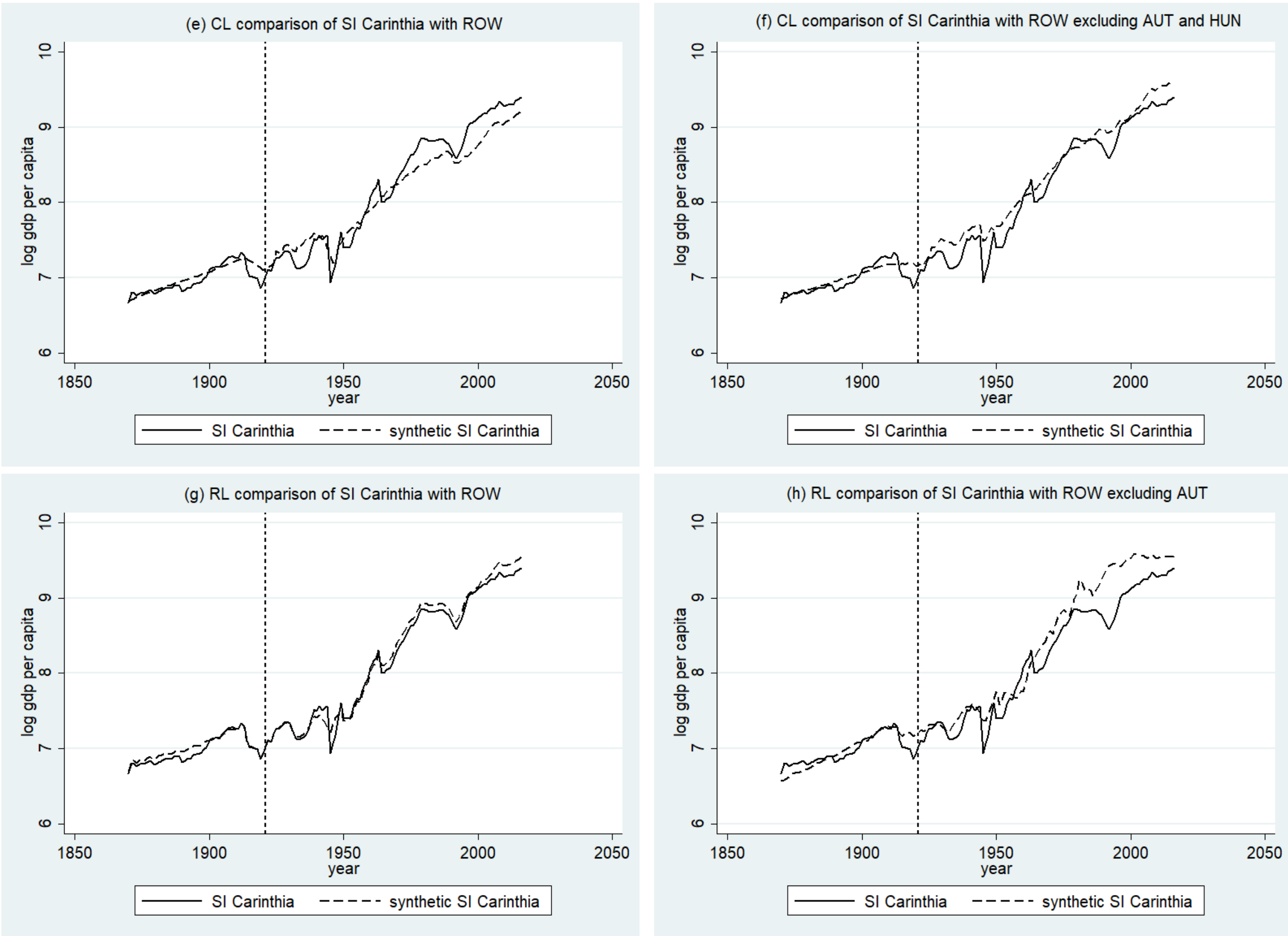
Source: Own work.

Figure 22: Leave one out analysis for AUT Carinthia with (2) GDP per capita as dependent variable



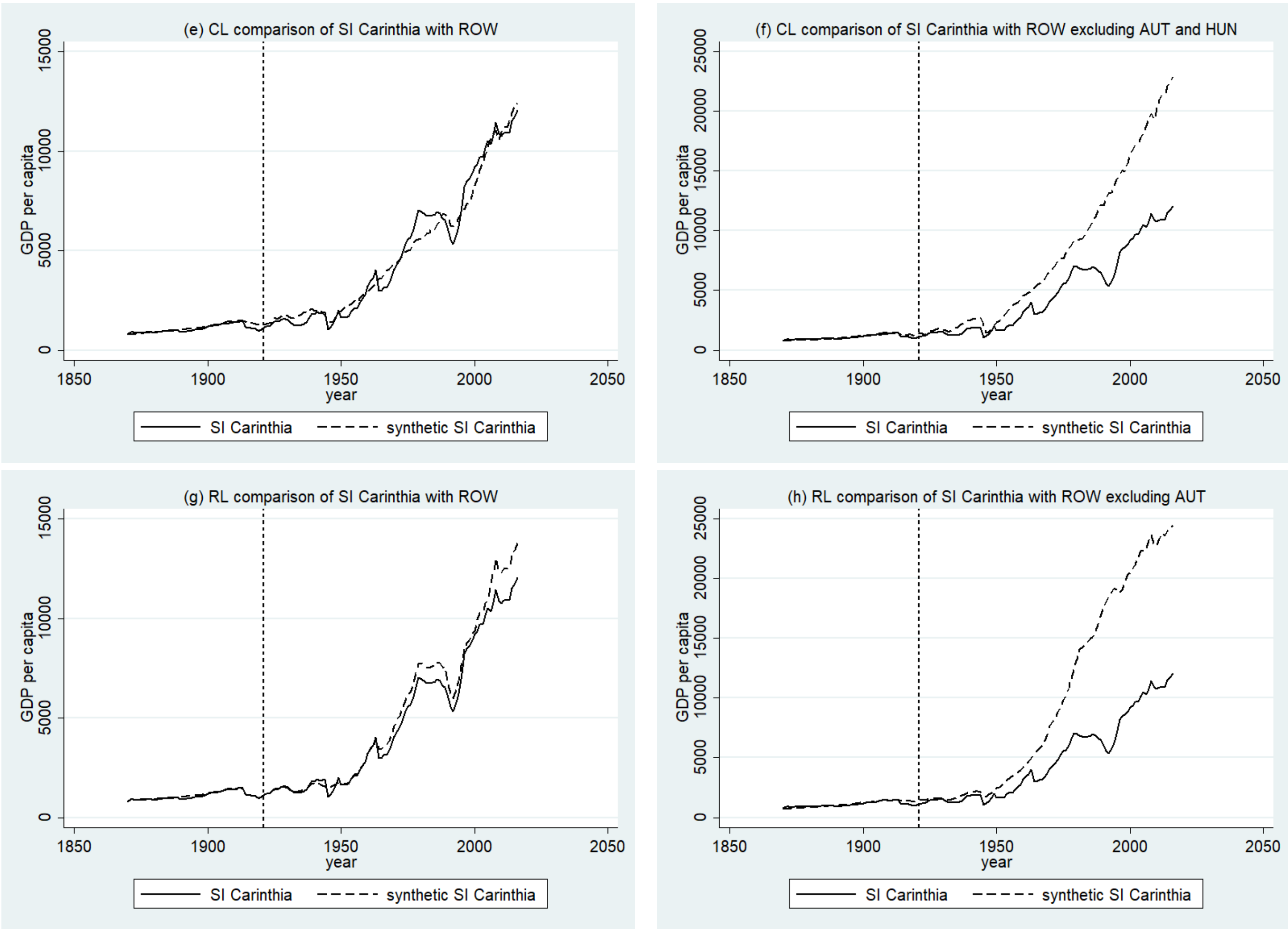
Source: Own work.

Figure 23: Leave one out analysis for SI Carinthia with (1) log GDP per capita as dependent variable



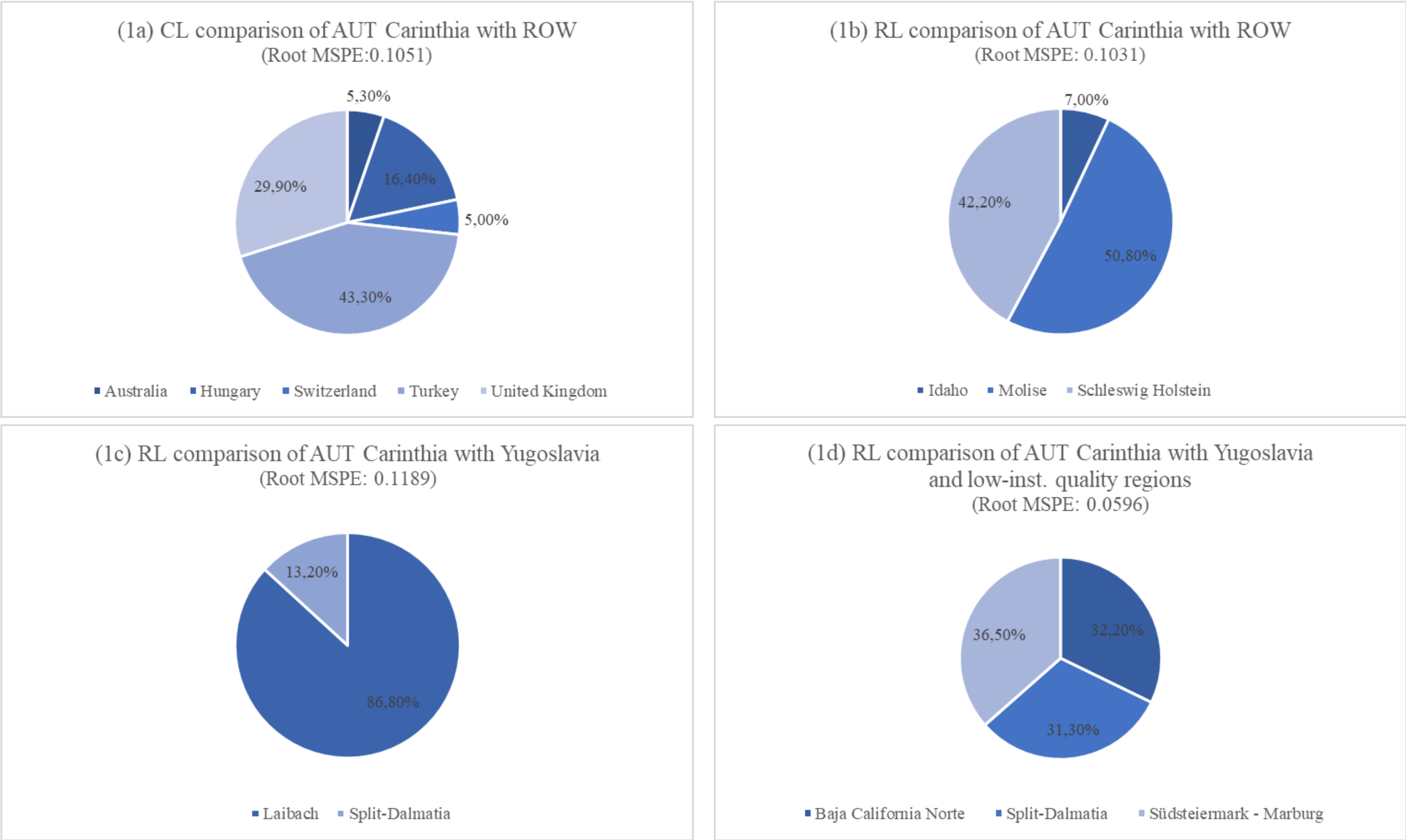
Source: Own work.

Figure 24: Leave one out analysis for SI Carinthia with (2) GDP per capita as dependent variable



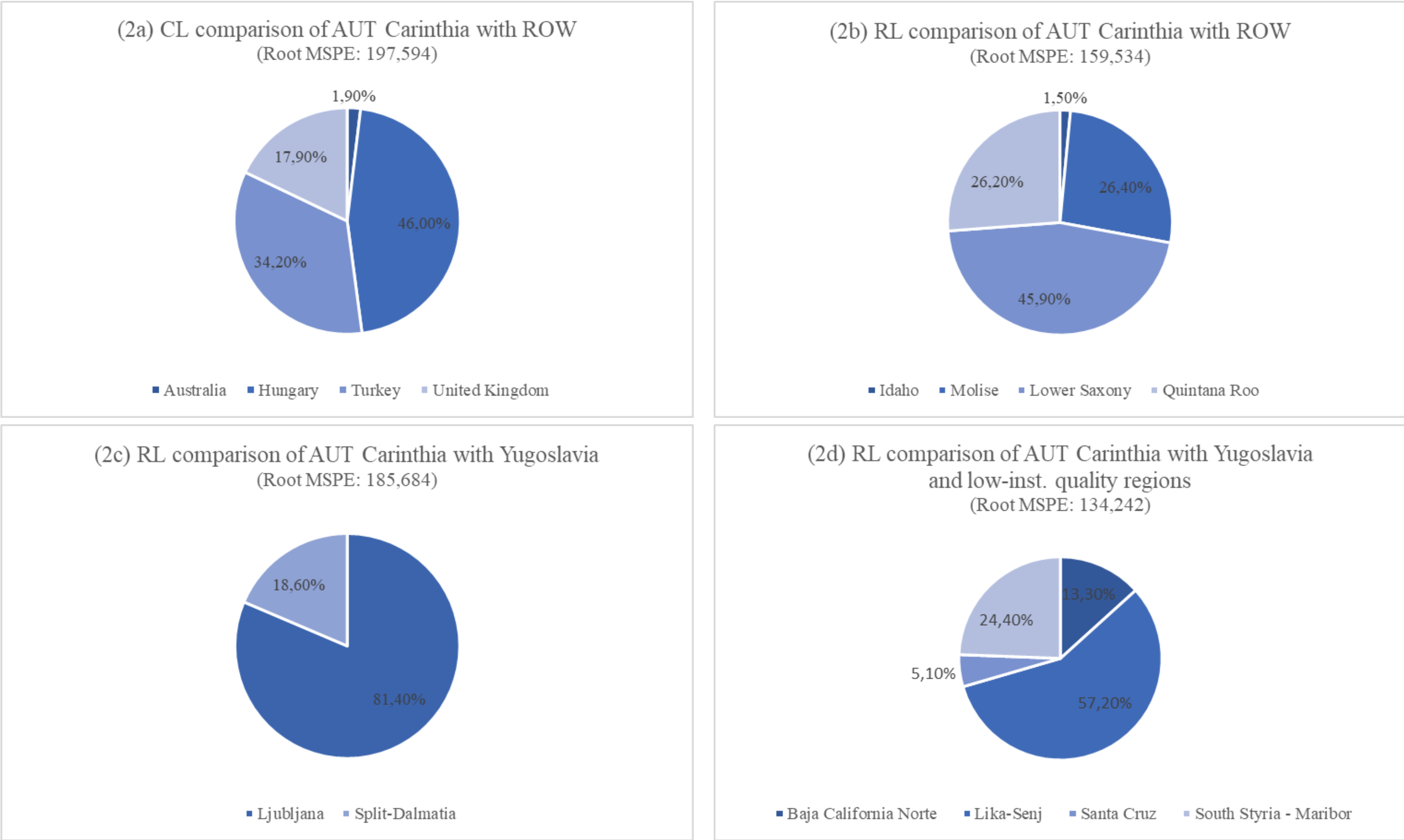
Source: Own work.

Figure 25: Leave one out analysis composition of Synthetic Control Groups for AUT Carinthia with log GDP per capita as dependent variable



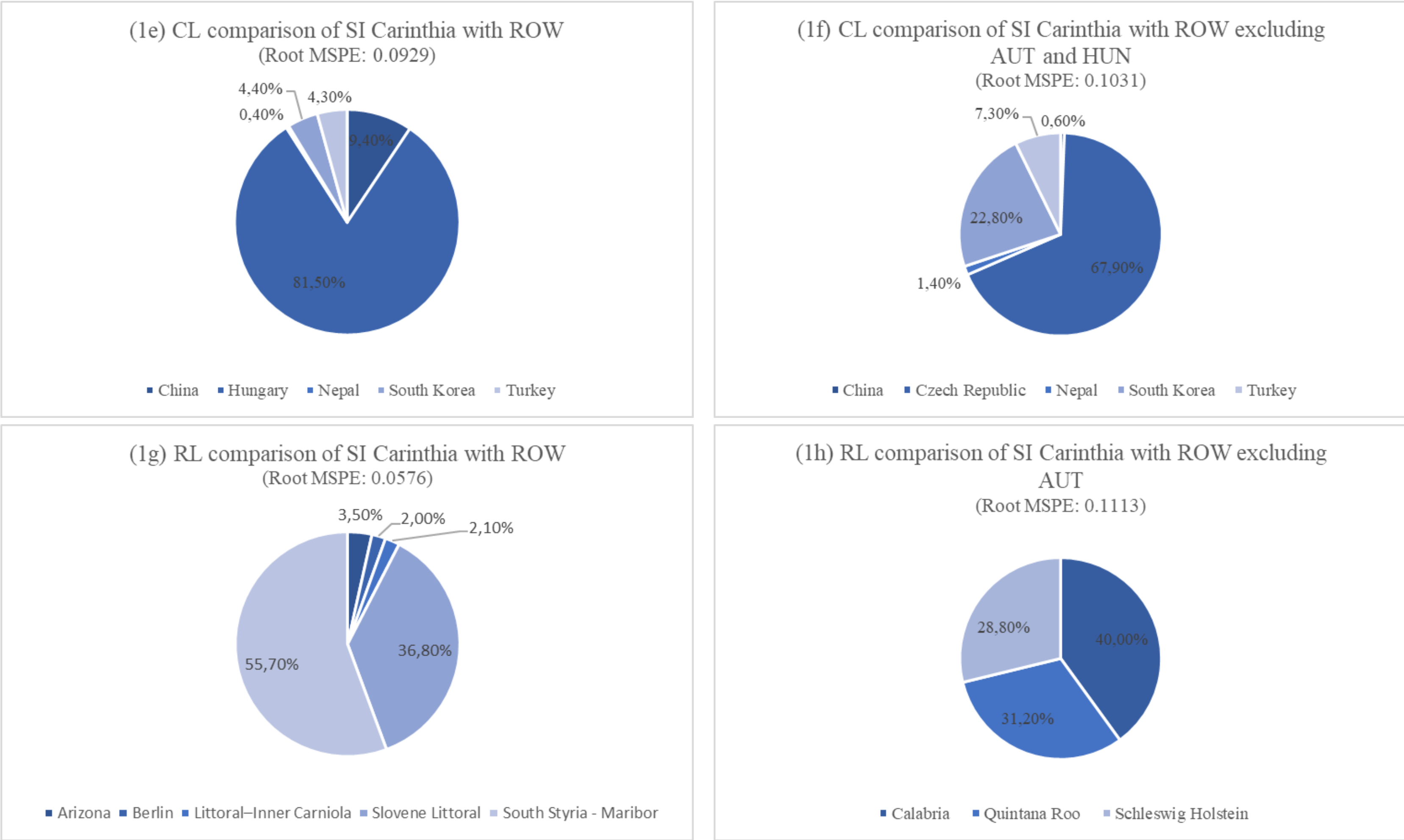
Source: Own work.

Figure 26: Leave one out analysis composition of Synthetic Control Groups for AUT Carinthia with (2) GDP per capita as dependent variable



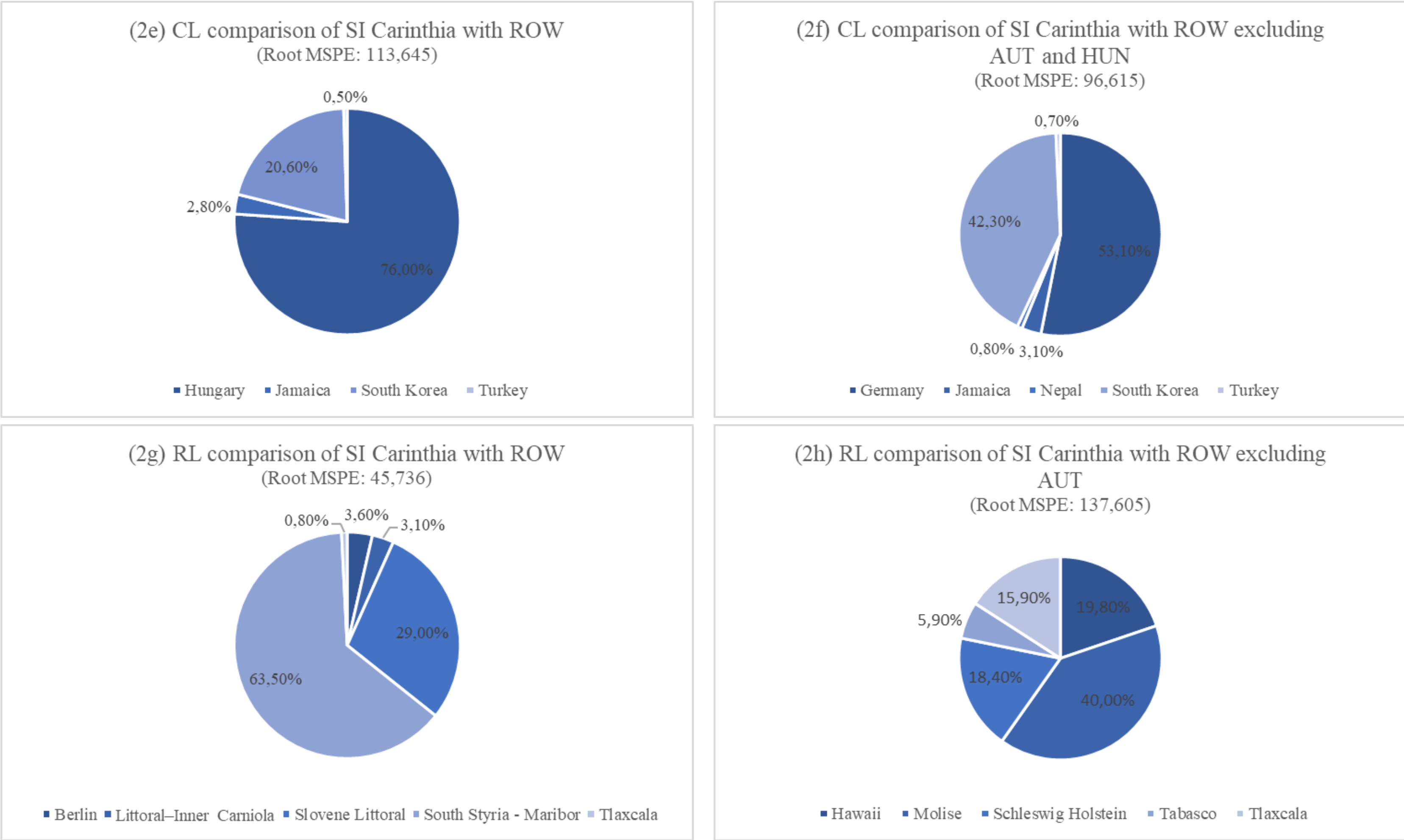
Source: Own work.

Figure 27: Leave one out analysis composition of Synthetic Control Groups for SI Carinthia with (1) log GDP per capita as dependent variable



Source: Own work.

Figure 28: Leave one out analysis composition of Synthetic Control Groups for SI Carinthia with (2) GDP per capita as dependent variable



Source: Own work.