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The Economic Impact of the 15th July Coup D'état in Turkey: A Synthetic Control Approach

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Abstract: As military coups have been a relatively common phenomenon both historically and in modern time, their potential impacts have long wanted to be evaluated proficiently. Previous studies have found that the effects seem to be generally negative, but alternative suggestions have also been presented. This paper is based on a study of the military coup attempt that hit Turkey on July 15, 2016, by using the synthetic control method and monthly data on industrial production, harmonized unemployment rate, real effective exchange rate and consumer price index for 21 OECD countries. By exploring the dynamics of the method, and investigating this recent event with high-frequency data, the approach is quite unique in its context. The findings imply that there are arguably visible effects of the coup attempt on the Turkish economy. Though the period observed, January 2015 until January 2017, did not bring any statistically significant results on industrial production, we found that following the military coup attempt in July 2016, the unemployment rate increased by 1 % on average.

Keywords: Political Economy, Coups, Synthetic control method, Turkey

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Abbreviations

AKP = Justice and Development Party

CBRT = Central Bank of the Republic of Turkey

CHP = Republican People's Party

CPI = Consumer price index

GDP = Gross domestic product

HDI = Human development index

HUR = Harmonized unemployment rate

LFPR = Labor force participation rate

PKK = Kurdistan Workers' Party

REER = Real effective exchange rate

RMSPE = Root mean square prediction error

SCM = Synthetic control method

1 Introduction

In the years between 1950 and 2016, 94 countries together faced over 230 military coups. Thus, military coups cannot be considered rare events in modern time. As a result, researchers have become interested in investigating the impact of military coups on society, and possible effects on the political power. However, finding any causal relationship between coups and development in a country is a challenge, not least since the risk of a coup might be greater in countries facing economic disadvantages, such as low income and low growth (Collier, Hoeffler 2006).

Broadly, economic effects of military coups are still a rather unexplored field of research, and the opinions of researchers when trying to clarify the effects of military coups on economic growth differ. For instance, the development of coups has been investigated through assessing differences between those overthrowing democratic leaders and those overthrowing autocratic leaders. In the paper, by Meyersson (2016), it is shown that there are dissimilarities between the two cases, based on differences in the implementation of undemocratic institutions following a coup in a democracy. Though autocratic countries can experience positive effects of military coups, as a reflection of a change of leaders, effects on democratic countries, even if considered negligible, are shown to be strictly damaging for the economic development through profounder institutional alterations.

This paper is a case study in political economy, where we aim to further investigate the possible economic impact of the military coup attempt in Turkey, July 2016. The potential economic outcomes will be assessed through use of the synthetic control method (SCM), and based on three measures, namely the industrial production, harmonized unemployment rate (HUR), real effective exchange rate (REER) and consumer price index (CPI).

The dataset will be based on both annual and monthly data. When constructing the final pool of countries in the study, denoted the donor pool, annual data of the gross domestic product (GDP) per capita and the human development index (HDI) will be assessed. The data analysis with the SCM will solely rely on monthly data on Industrial production, HUR, REER and CPI. In the analysis, Turkey will be represented as a treatment group, the country affected by the military coup attempt, and compared to the "Synthetic Turkey," a control group consisting of 20 countries in a donor pool. The SCM generates the synthetic counterpart of Turkey by an assessment of the various countries, weighting them on the grade of resemblance with Turkey. The aim is to generate weights of the countries in the donor pool as similar to Turkey as possible in the pre-intervention

period (the pre-coup period) to conduct the analysis correctly. Thereby, results before and after the military coup attempt can be evaluated, with the objective to observe possible outlier effects.

Firstly, relevant background will be presented, including the history of Turkey and the events that most likely initiated the coup attempt. This will be followed by a review of prior literature, including studies on military coups and coup attempts as well as studies conducted with the SCM. The method, choice of countries in the donor pool, as well as the time-frame of the variables included, will then be presented thoroughly, along with possible fallacies of both method and choice of variables. Lastly, the results will be presented, compared and discussed to identify possible effects linked to the military coup attempt in 2016 and its implications for the future, combined with recommendations for future research.

2 Background

Successful military coups are often associated with a dramatic turnover of the political power, combined with severe human suffering. The interconnected abuse of human rights is defended by the military-junta, as they denote it as a necessity to regain order and stability in the affected country. Hence, most researchers agree that military coups are detrimental for democracy (Dahl 1971; Huntingtin 1965; Linz & Stepan 1996).

Another view is that military coups have limited to no effect. For instance, Olsen (1963) states that they often bring no policy changes and Londregan and Poole (1990), who investigated data from 121 countries between 1950 and 1982, find that the likeliness of a coup is prejudiced by the level of economic performance. Specifically, they argue that coups are 21 times more probable to occur in the poorest countries in their dataset. However, they find no evidence of coups affecting income growth in their analysis.

When it comes to the modern history of Turkish politics, it has been characterized by instability and numerous events of military invention. Democratically elected leaders, such as Adnan Menderes, Süleyman Demirel and Necmettin Erbakan have been overthrown, and nearly one military coup, or coup attempt, has hit the country every decade since the 1960's. Consequently, it is realistic to suppose that the pattern of military intervention historically emerged due to an increase in the power of the military. This has also enabled interference with the civil government as soon as slightest disagreement occurred. Since the late 1990's, and under President Erdogan's AKP, reforms seizing the power of the military, and correspondingly increasing the power of the civil government, have been carried out. Yet, in July 2016, Turkey was shocked by one of the fiercest military coup attempts in the history of the republic. (Al Jazeera 2016)

In the year of 1960, under governing of the Democratic Party, a phase of tensions had been intensified amongst the opposition and the government. This resulted in the first military coup in the country. Prime Minister Adnan Menderes, together with president Celal Bayar, had reopened mosques and legalized the call to prayer in Arabic. In other words, strictly secular rules initially set by the republic's first President, Mustafa Kemal (also called Ataturk) were loosen. The tensions following the legalizations put strains on the country, and caused an establishment of martial law in the beginning of 1960. On May 27th, the army overthrew the government and arrested them for

treason among other offences, followed by the execution of Menderes and several of his comrades (Al Jazeera 2016).

During the 1970's, worker's groups and right-wing groups carried out violent demonstrations as a reaction to the economic downturn in the post-coup period. In March 1971, the military accused the government, under Prime Minister Suleyman Demirel, of deteriorated control of the country, driving it into anarchy. The military put pressure on Demirel to resign in favor of the formation of a stronger, more autocratic government. Nihat Erim, a member of the CHP founded by Mustafa Kemal Ataturk, received the presidential post and formed a caretaker government. Erim led the government until he was replaced by the former naval officer, Fahri Koruturk, in 1973 (ibid.).

The military failed to rebuild order after the coup in 1971, and political instability became a daily actuality. In September 1980, the military under Kenan Evren announced, via state television, that it had taken over the government. Even though the violent clashes between left- and right-wing activists allayed, the government was associated with severe crimes connected to human rights. For instance, hundreds were arrested and thousands were executed. Evren rewrote the entire constitution before his withdrawal in 1982, and the Turkish constitution is inherited from that period. Though the events had taken its toll on the Turkish economy, it was calmed when Turgut Özal, a member of the Motherland Party (Anavatan Partisi, ANAP), became prime minister in 1983. He succeeded with reducing the inflation as well as the unemployment rate.

The Welfare Party, led by Necmettin Erbakan, was elected as head of the coalition government in 1995. Two years later, the military issued a series of recommendations towards Erbakan, that the government was forced to follow. It concerned the prevention of religious liberal reforms, such as a prohibition to wear headscarves at universities and a prohibition to attend religious schools. Erbakan had to resign later that year. On February 28, 1997, the Welfare Party was shut down by the military and Erbakan was banned to engage in politics for five years. This event is now known as the "postmodern coup" (ibid.).

2.1 The conservative movements in Turkey

Hizmet, the so-called Gülen movement, was founded in Turkish city Izmir by a Turkish Imam named Fethullah Gülen. The organization expanded quickly during the 1960's through its

construction of student housing, and already had thousands of followers in the 1970's. Hizmet managed to expand its network, consisting of mostly private schools and tutoring centers. For a deeper analysis of the movement's impact on Turkey's political and economic transformation, see Hendrick (2013). After the military coup in 1980, the secular military accused Fethullah Gülen, of attempting to Islamize the country, whereupon he emigrated to the US. He was arrested after six years and freed of charges in 2000. Gülen advantaged his support for the post-coup state, prioritizing the expansion of the organization itself over support for other Islamic groups. Contradictory as it may seem, he even supported the soft coup against Necmettin Erbakan's Welfare Party in 1997. When the military turned against Hizmet, they decided to support other conservative movements and parties in Turkey (Vicini 2014).

In the early years of 2000, Hizmet managed school activities in over 100 schools all over Turkey, but also internationally in countries such as the United States, Sweden and muslim countries such as Pakistan and Turkic former Soviet republics (Skolvärlden 2016). It was believed that supporters had influential positions in the bureaucratic machinery, such as the police, the intelligence service, the judiciary and the AKP (BBC 2016).

The AKP originated from the Welfare Party founded by Necmettin Erbakan, which changed title to the Virtue Party (Fazilet Partisi) after the soft coup in 1997. Unlike Fethullah Gülen, who opposed the creation of alliances with other non-Turkish Muslim organizations, Erbakan's party considered itself ideologically close to the Muslim Brotherhood, and saw itself as a part of a larger transnational Muslim movement (Öktem 1989, p. 127). Apart from its ideological differences from Hizmet, the AKP opposed the military interventions and considered the deep state, formed by the military, as its opposition since start. It was within the Welfare Party that Turkey's current President Recep Tayyip Erdogan was elected mayor of Istanbul, and the party achieved support in the national elections, leading to the election of Erbakan as prime minister. In 2002, Erdogan and Abdullah Gül separated from the Virtue Party and participated in the election as the AKP. Ideologically, they defined themselves as promoting conservative democracy, combining religious piety, democracy and market commitment (Öktem 1989, p. 123).

Shortly thereafter, Hizmet and organizations tied to the movement began to support the AKP in opposition against the secular military. Hizmet's networks and organizations successfully supported the AKP in the election in 2002, which gave the movement better access to the state institutions (El-Kazaz 2015). In March 2003, the military was accused of planning a coup to overthrow the

newly elected AKP government. Subsequently in 2010, what has come to be called the "Sledgehammer Case" took place. As a result, 300 army officials were sentenced to prison, but most of the evidence was later found to be fabricated. According to the Turkish journalist and academic Ezgi Basaran, the trials were arranged by followers of Hizmet working within the military, intelligence service, police and judiciary (BBC 2016).

Hizmet, with affiliates within the institutions, also used their positions to put pressure on the government. For instance, the state prosecutor accused the head of the Turkish National Intelligence Service (MIT), for negotiating with Kurdish parties and having relationships with the listed terrorist organization PKK. Moreover, Today's Zaman, a Turkish newspaper, supported the anti-government Gezi protests carried out in Istanbul in June the same year, a move that further accelerated the government-Hizmet conflict. Hizmet was accused of attempting to create a parallel state working against the government the same year.

In December 2013, public prosecutors with connections to Hizmet carried out dawn raids against businessmen and sons of ministers within the AKP, intensifying the situation further. The prosecuted individuals were charged with corruption and bribery for helping Iran to impose financial sanctions on Hizmet, in return for sending oil and natural gas to the regime in Tehran (Haberturk 2013). Fethullah Gülen made an invocation of harm against Erdogan's government shortly thereafter, which received a lot of critique among religious leaders in Turkey and internationally. In response, the government began an operation of shutting down schools believed to be connected to the Gülen movement in Turkey. The Turkish government declared all organizations that were linked to Hizmet as terrorist organizations in May 2016 (Radikal 2013). On July 11, 2016, the Turkish newspaper Cumhuriyet reported a list of 200 highly ranked officers that were accused of having connections to Fethullah Gülen. They were going to be expelled on the annual meeting held by Turkey's Supreme Military Council (YAS) in August the same year (Cumhuriyet 2016).

Only days later, on July 15, 2016, one of the worst coups in Turkey's political history was carried out by a small fragment of the Turkish Armed Forces. Reports of F-16 fighter jets bombing the parliament building, shootings in Istanbul and Ankara and tanks blocking the Bosphorus Bridge flourished in the media. The government was accused of eroding peace and democracy, and the citizens were called to stay inside as curfew and martial law were announced. Through a live news broadcast at CNN Turk, President Erdogan urged people take to the streets to counteract the

military coup. At 11.50 p.m., Prime Minister Yildirim announced that the coup had failed and that the government had the situation under control.

In total, 241 people were brutally killed and 2194 people were wounded. Many of those were unarmed civilians taking to the streets. The Turkish government was early to accuse Fethullah Gülen and his movement for the coup attempt. Turkey's Energy minister Berat Albayrak, suggested that parts of the military wanted to carry out the coup as a last move since they knew that they were about to be removed from their positions as a part of a general shake-up against Hizmet supporters within the machinery of state (The Times of Israel 2016). Fethullah Gülen, on the other hand, denied all accusations, and stated that the coup attempt was a false flag operation staged by the government to justify further operations against Hizmet (Westcott 2016).

Shortly thereafter, the Turkish government declared a state of emergency and decided to remove all the fundamentals of the organization involved in the coup attempt. Since the coup attempt, over 100,000 people have been suspended from their positions, and 37,000 people within various state institutions, suspected of Gülenist infiltration, have been arrested. Dozens of media channels have been suspected of cooperating with Hizmet, and has therefore also been shut down (Al Jazeera 2016a).

2.2 The Turkish economy 2015-2017

According to Brinded (2016), the coup attempt was believed to have an impact on the Turkish economic growth, on fixed income and the currency, but not affect other emerging markets situated close. It was estimated that a previous prediction regarding the growth of the country before the coup attempt, 2.9 %, would be reduced through lost confidence and public spending. Also, the stocks were predicted to suffer, out of previous experience related to uncertainty in the political climate.

Lately, one of the largest challenges for the Turkish government has been to reduce the current account deficit, which is a structural problem within the Turkish economy, causing an insufficient use of the economic growth potential. The most critical factor contributing to the account deficit is the large import of energy steaming from the increased energy consumption, followed by the economic development of the country during the last decade. Around 50 % of the energy consumption comes from natural gas, leading to a dependence on energy imports. To tackle this

problem, the government has moved towards developing its domestic resources and created alternative partnerships with countries such as Russia and China. Turkey is currently working on developing their nuclear energy centrals as well as producing renewable energy in the process towards becoming more self-sufficient (Karagol 2016).

The coup attempt, and the political instability, have had important implications on Turkey's trade deficit in various aspects. The Turkish Lira was weakened during 2016, and the depreciation in the last three months was about 20 % with respect to the US dollar. This has intensified the pressure on corporate balance sheets and bank asset quality, due to a high dependence on foreign currency (FX) loans. Turkey has taken steps to reduce the need for those by making public institutions collect FX receivables in the domestic currency, and making public procurement contracts payable in lira. As a result, the government has reduced the Gross International Reserves (GIR) to US$114 billion in November, a reduction of $US4 billion. The GIR continued to fall in December 2016, and the increase in the REER has had an important implication for Turkey's problem with its account deficit (International Monetary Fund. European Dept. 2017, p.11).

Moreover, the costs of financing planned investments such as the energy program have increased, which complicates the process of decreasing the level of the current account deficit, reaching 4.5 % of GDP in 2016. In October 2016, the REER had increased about 10 % from its low level in September 2015. The level of the account deficit is 1-4 % higher than the estimated norm, implying a REER overvaluation of between 5 to 15 % on average in 2016 (ibid.). Despite the positive contribution from lower oil prices, the effect has been offset by other effects such as the weak tourism season.

The tourism arrival from Europe decreased by over 30 %, and by two thirds from Russia, during January-September 2016. The large number of terrorist attacks carried out by organizations such as PKK and ISIS, the Russian sanctions after the conflict in December related to the Russian aircraft downed near the Syrian border in December 2015, as well as the violence and instability connected to the military coup attempt in July 2016 have all contributed to this. According to (ibid.), studies show that the effect on tourist arrivals connected to safety concerns tend to be long-lasting under conditions of political uncertainty combined with frequent terrorist attacks. This have important implications for the long-term economic recovery of the country.

The damage to the tourism sector also had spillover effects on other sectors, such as transportation, food and accommodation. Over 46 % of the total tourist expenditures come from these three sectors. For instance, the export of transportation services has dropped around 30 % in 2016. IMF

further estimates that a 10 percent shock in foreign arrivals corresponds to a 0.3-0.5 % impact on GDP the first year following the shock (ibid.). These effects have important implications for the inflation. Turkey's inflation increased by 4.05 % in March 2017, since July 2016, which was mainly stimulated by the large food inflation of 15.63 % between April 2016 and April 2017. The positive effects from the low oil prices were offset by the effects of increased food prices (Trading Economics 2017).

In a press release from the International Monetary Fund (2017, pp. 72-73), Alternate Executive Director of Turkey, Mr. Taşkın Temiz, states that the Turkish authorities took immediate actions to minimize the negative effects on the financial markets. The CBRT took measures to provide banks with necessary liquidity. Banks could place FX deposits as collateral and Turkish Lira liquidity was provided without limits. Moreover, the CBRT's actions included lowering reserve requirements, allowing increased use of gold and foreign currency, and offering unlimited Lira liquidity against FX collateral. Since November 2016, the CBRT have gradually withdrawn the unlimited provision of Turkish Lira liquidity against the FX collateral in line with IMFs recommendations.

In January 2017, according to national estimates from the Turkish Statistical Institute (2017), the number of unemployed persons aged 15 years or over was 3.985.000. This corresponds to 13 % of the population and an increase of 1.9 % (695.000) compared to the same period last year. Non-agricultural unemployment in January 2017 was 15.2 %, corresponding to a 2.2 % increase since the same period last year. Youth unemployment for 15-24 years olds was 24.5 %, a 5.3 % increase since January 2016, while the unemployment rate for 15-64 year olds was 13.3 % in January 2017 with a 2 % increase since last year. The seasonally adjusted unemployment rate increased from 10.1 % in January 2016 to 11.8 % in January 2017, corresponding to an increase of 1.7 %.

Interesting to note is that, according to national estimates, the LFPR has increased significantly. It is defined as the number of employed and unemployed people looking for a job divided by the total working-age population. The LFPR was 51.4 % in January 2017, corresponding to a 0.8 % increase compared to the same period last year. The LFPR for men was 71.5 %, an increase of 0.7 %, while it was 32 % for women, with a 1 %. The seasonally adjusted LFPR realized was 52.5 %, an increase of 0.8 % since January 2016. The labor participation rate which averaged to 47.37 percent between 2005-2017, increased to an all-time high in November 2016 at 52.50 % (ibid.).

3 Literature review

When it comes to the SCM, there are examples of research applying it to recognize causal effects of political violence. As previously stated, in Meyersson (2016) it is shown that coups overthrowing democratically elected leaders are highly discouraging for a country's democratic development. It was specified that, in democratic countries, a successful coup lowered annual growth in GDP per capita by as much as 1.0-1.3 % over a decade. In contrast, the results in autocratic countries were much less conclusive and did show smaller positive effects. It was stated that coups often result in more long-term institutional changes in democratic countries compared to autocratic countries. By examining various military coups, he showed that coups that succeeded in overthrowing democratically-elected leaders reduced economic growth significantly over a decade.

Furthermore, in Meyersson (2017), it is found that Turkey under the AKP grew no faster in terms of GDP per capita when comparing to a synthetic counterpart. Bilgel and Karahasan (2016) also use the SCM when analyzing the effect of PKK terrorism in Turkey. They show that, during a post-intervention period of 14 years, GDP per capita declined by 6.6 % relative to the synthetic counterpart. The same method has also been used to analyze the ETA Violence in Spain, where the results indicate a reduction in GDP per capita of 10 % relative to the control group (Abadie and Gardeazabal 2003).

When it comes to studies on the dynamics of the SCM, Kaul et al. (2017) have found that matching on all pre-intervention outcomes as separate predictors, when conducting the SCM, leads to zero weights on all other economic predictors included in the study. They argue that this can improve the fit of the model, but only if it is proved that the covariates are not vital for it. Otherwise, it can jeopardize the unbiasedness of the model. Moreover, Nannicini and Billmeier (2013), state the exact opposite, that it is suitable to include all pre-intervention observations can improve the fit of the SCM.

There is also evidence confirming that coups can affect mechanisms of development other than GDP per capita. It is shown that coups have a negative effect on infant mortality, education, investment and indebtedness Meyersson (2016). Even though coups may have short-run positive effects such as enforcing law and order and creating stability, he claims that the military intervention does not tend to solve the underlying problems creating the perceived necessity of the coup, and that short-run benefits therefore come at the cost of severely negative economic, political and

human consequences. The effect is often connected to reallocating power across interest groups and restricting the ability for the people to influence policy making. Concerning other related literature, inspections have been conducted on the economic effects of political instability and violence by Aisen and Veiga (2011). They investigate a period from 1960-2004, and find that political instability affects the growth in a country by lowering the rates of productivity growth, while economic freedom is beneficial to growth.

4 Research design

4.1 Research question and purpose

Though previous research has been performed on military coups, it has, as far as we are aware, not been any study conducted on the military coup attempt in Turkey, July 2016. This study is unique in the sense that is only contains high-frequency data, paving the way for the strength of the SCM to be explored in a different setting. Also, it is aimed to contribute to the knowledge on the effect of the military coup attempt in Turkey 2016 as well as discussing some possible long-term structural effects on the Turkish society. Since the Turkish case is unique due to the added dimension of a transnational organization accused of infiltrating the state machinery to such a large extent, which has affected the society to a large extent after the coup attempt, it is difficult to draw any conclusions regarding external validity. Therefore, with the data at hand, we are not able to state whether our results are generalizable or not.

Specifically, our research question is: How has the military coup attempt in July 2016 affected the Turkish economy? The economy is, in this case, based on an SCM-analysis on the variables industrial production, HUR, REER and CPI.

4.2 The synthetic control method

When analyzing the outcome of an intervention in a specific country, at a specific time, it is often hard to find suitable comparison countries. Therefore, by providing a technique to use various comparison units to reproduce the counterfactual of the intervention in the absence of it, the SCM provides a solution making it more convenient to study the possible effect of an intervention of interest (Abadie and Garedazabal 2003; Abadie, Diamond, and Hainmueller 2010). The following methodology is mostly inspired by a description in Meyersson (2017).

It is assumed that there are $i = 1, \dots, I + 1$ units, over T periods labeled $t = 1,2, \dots, T$, and further presumed that unit i = 1 represents the treatment unit, in which the intervention of interest occurred, in this case the military coup attempt in Turkey. The other i + 2 to I units represent the control countries, a reservoir of comparison units that are denoted as the donor pool, with which the synthetic control is designed. Further, $T_0 + 1$ symbolizes the treatment period, here the time of

the military coup in Turkey. This implies that $1, 2, \dots, T_0$ signifies the pre-intervention periods and that $T_0 + 1$, $T_0 + 2$, …, T signifies the post-intervention periods. The main objective is to find an effect of the intervention on the post-intervention period of the treatment country, by comparing to a weighted average of the countries in the donor pool, which can reproduce the treatment country better than a single untreated unit.

When applying the SCM, the first result is Y_{1t}^N, an outcome for unit one (the treatment unit) in period t without treatment, and Y_{1t}^C, that is observable for the same unit if there was a treatment. Hence, the aspiration is to estimate $a_{1t} = Y_{1t}^C - Y_{1t}^N$, in the periods after the intervention, to observe possible effects of the event of interest.

The model is consequently represented by a $I + 1$ vector of weights $W = w_{2\dots}, w_{i+1}$. It is further supposed that there are k diverse covariates, represented by a $k \times 1$ vector X_1vector of the covariate values for the treated unit and $k \times I$ vector X_0 referring to the donor pool units. Accordingly, in the pre-intervention period, the difference between the both is $X_1 - X_0 W$. To minimize the difference, it is vital that the weights, W, are optimal for the model, and minimizes the following expression

$$\sum_{m=1}^{k} v_m (X_{1m} - X_{0m} W)^2 \tag{1}$$

Where $v_m$reflects the weights that covariates get based on their predictive power, $m = 1, \dots, k$ and X_{1m} is the m:th variable for the treated unit, and X_{0m} refers to the $1 \times I$ vector, in other words the values of the m:th variable for the units of the donor pool.

The result wanted is the difference between the treated unit and the synthetic counterpart in post-intervention period denoted t

$$\widehat{a_{1t}} = \mathrm{Y}_{1t} - \sum_{i=2}^{I+1} \mathrm{w}_i^* \mathrm{Y}_{it} \tag{2}$$

Hence, when using the first equation (1) we get the last expression in (2), since it represents the weighted average of the donor pool, $I + 1$.

In other words, the weights are allocated to the countries in the donor pool so that the pre-intervention dependent variable (in this case the industrial production) is comparable, or closest to, the treatment country's (in this case Turkey). This comparability is decided by the minimization of RMSPE in the pre-intervention period, measuring the degree of fit between the course of the Turkish dependent variable and the synthetic variable of the donor pool. Then, the SCM generates a prediction of the post-intervention outcome for the synthetic variable and the dependent variable, that can later be used to assess the differences between the both. Hence, it is possible to observe effects in absence of the intervention, which in this case creates an opportunity to analyze the possible effects of the coup D'etat in Turkey, July 15, 2016.

4.3 Inference

To assess the reliability of the results obtained with the SCM, several placebo tests can be conducted. If these tests provide large placebo results, it would undermine the estimated effect of the study, and thus bring doubt to the fact that the event studied have had an effect unique to the unit of interest.

In other words, to ensure that the results reflect a distinctive impact of an intervention on a specific unit, in this case the military coup attempt in Turkey, placebo tests are central when using the SCM. Firstly, a change of treatment period, denoted "0" in this study, can be performed to investigate whether the results change dramatically compared to the original case. The model would in this case be altered so that the time for the coup attempt is in the middle of the pre-intervention period, which would correspond to September 2015. Apart from this, the same synthetic control predictors are used. However, due to the short time period observed in this study, the in-time placebo measure will be omitted.

In addition, in-space placebo tests can be conducted, in accordance with Abadie, Diamond, and Hainmueller (2010). The purpose is to reassign the treatment, in this case the military coup attempt, to the different comparison units, here each country in the donor pool. By doing so, it is possible to analyze synthetic control estimates for countries that originally were selected to estimate the synthetic counterpart of Turkey. Thereafter, the visible distribution of placebo effects can be compared to the original effect of the military coup attempt on Turkey. If the countries in the donor pool show a relatively large estimated effect compared to the effect on Turkey, the latter can

be considered insignificant. In addition, by generating a p-value out of the placebo information, the results can be assessed by determining whether the estimated effect on the treated unit is large in relation to the distributions assigned to the units in the donor pool.

4.4 Limitations of the method

Even though this method is very usable in comparable case studies when it is hard to find relevant comparison units, in this case countries, there are several possible limitations that should be taken into consideration. For instance, when the event of interest could have affected a larger region, the treatment group will be very limited, as countries affected by the event cannot be included in the donor pool. Also, countries faced by events of similar nature need to be excluded to avoid idiosyncratic shocks, which also applies to countries that have been affected by some influential intervention in the same period as the treated country. The reason is connected to the fact that the aim of the study is to create a synthetic counterpart similar to the country of interest, but that has not faced the intervention of interest. Therefore, the method also requires a limitation of the study to countries with similar characteristics, with the purpose to avoid interpolation bias and obtain a good match in the pre-intervention period. Also, the method is argued to estimate the pre-intervention period in a better manner and avoid heterogeneity if the number of periods is large (ibid.).

5 Data and sample

The data used in the study is monthly balanced panel data for 21 OECD countries, including Turkey (OECD Data 2017). As the intervention of interest, the military coup attempt in Turkey in July 2016, is a current event, the study relies on high-frequency data. The data is required to be monthly to observe possible effects from the coup until now, which refers to about six months given the data available. Therefore, measures such as GDP per capita cannot be used when conducting the SCM, since monthly data on it is not available. To get around this issue, data on industrial production is used as a substitute, as it is measured monthly and constitutes a part of the GDP. Additional predictors used are the HUR, REER and CPI.

There are many possible sources providing this data, for instance the World Bank, OECD and BIS (Bank for International Settlements). In this case, the data on industrial production, HUR and CPI are collected from OECD (ibid.), providing accessible monthly data of both pre- and post-intervention periods of interest. The data on REER is collected from BIS. One negative aspect of the data sources might be the limitation of possible control units for the donor pool, but the choice to limit the scope of the donor pool to OECD nations is not believed to bias the outcome, and adding other countries to the donor pool is not considered to affect the outcome rigorously. Moreover, monthly data of this nature for other countries of interest is hard to access.

As stated, since the study is recent and relies on high-frequency data, the pre-intervention period will be one and a half year, beginning in January 2015 and ending in June 2016. The reason for ending the pre-intervention period one month ahead of the actual intervention will be discussed in the result section. The post-intervention period is therefore seven months, specifically from July 2016 until January 2017.

5.1 Constructing the donor pool

To correctly visualize a causal effect of the military coup attempt on the Turkish economy using the variables stated, one condition that must be fulfilled is that none of the countries in the donor pool have been affected by military coups or coup attempts during the same period as Turkey, as argued before. When research is conducted on military coups and military coup attempts between January 2015 and June 2016, it can be found that Burkina Faso and Burundi (Reuters 2015) both

faced coup attempts during 2015. These countries would thus have had to be excluded directly, if working with a larger variation of countries than only OECD countries.

Furthermore, in this case, it is extremely important that the comparison units, that are meant to form the donor pool, are supposedly driven by the same structural processes as for the nation of interest. However, it is vital that these nations have not been subject to similar shocks, military coups, during the period of study, since the nations of comparison are meant to reflect the counterfactual of Turkey without the intervention. In other words, the method relies on the necessity of specifying the impact of the 2016 military coup attempt in Turkey by making sure that the nations added to the donor pool have not been exposed to equal events, as previously stated.

A problem that is faced is that of selection bias, since the assignment of units to treatment and control groups is not random in observational studies. However, the SCM will not provide a good fit in the pre-intervention period if incorrect weights are assigned to countries that are not similar to Turkey, meaning that the causal effect will, in this case, possibly be biased. To control for this, the GDP (PPP) per capita as well as HDI of all OECD countries is assessed before conducting the study, to restrict the donor pool further. This implies that the donor pool will be restricted to nations with characteristics as similar as possible to Turkey.

Firstly, by assessing GDP, Norway, Switzerland and the United States are excluded directly based on their far distant level in comparison to Turkey's. Further, a common characteristic for developed countries with small populations are an unusually high GDP per capita. Luxemburg and Iceland are to countries with this characteristic, creating a large difference in GDP per capita in comparison to Turkey with its over 80 million citizens. On this ground, both Luxembourg and Iceland were dismissed from the control group.

It was observed that Ireland grew at an unusually high rate, 26 %, in 2015. However, economists state that this solely was an effect of U.S firms exploiting the low tax rate in the country, inverting into Ireland mostly through acquisitions (Doyle 2016). But even though Irish economists state that the growth is only around 5.5 % looking at variables such as tax revenues and the employment rate, the decision to exclude Ireland from the donor pool remains intact due to its risk of imposing a biased effect on the outcome variable.

Finally, a combination of the remaining OECD countries HDI and GDP (PPP) per capita scores was screened to more carefully distinguish between countries with similar characteristics to Turkey and countries that was notably different (United Nations Development Programme 2016). It was found that Denmark, New Zealand, Sweden, the Netherlands, Canada, Germany, Australia and the United Kingdom all had significantly higher GDP and/or HDI scores than Turkey, and these countries were excluded accordingly (United Nations Development Programme 2016a).

Our final donor pool, to be used in the synthetic control process, consists of 20 countries, namely Mexico, Latvia, Spain, Slovenia, Slovak Republic, Portugal, Poland, Republic of Korea, Japan, Italy, Israel, Hungary, Greece, France, Finland, Estonia, Czech Republic, Chile, Belgium and Austria.

6 Results

As the SCM is relatively uncharted, its dynamics are investigated to compare possible dissimilar outcomes given different predictors and time intervals. Kaul et al. (2017) argue that it is important to do this in order to prove that the underlying economic model and the covariates must not be reconsidered. Furthermore, they argue that using all pre-intervention outcomes as separate predictors in the synthetic control leads to zero weights for all other economic predictors included, which is not desirable if they can contribute with some explanatory power. Though this can produce an optimal pre-treatment fit, it can lead to bias since it ignores important covariates. Meanwhile, Nannicini and Billmeier (2013) state the exact opposite, that including all the pre-intervention observations as separate predictors in the synthetic control can improve the fit of the model.

By using the SCM, a synthetic Turkey can be generated from the donor pool of 20 OECD countries. The distribution of weights is, in each of the different cases described below, assigned to each country so that the synthetic Turkey best reproduces the real Turkey in the pre-intervention period through a minimization of RMSPE. As stated, the assessment of potential outcomes of the military coup attempt is then based on a comparison between the actual and the synthetic outcomes in the post-intervention period and the pre-intervention period. When using the SCM, a monthly balanced panel of industrial production in 21 different OECD countries is used, combined with the equivalent data on REER, HUR and CPI.

All results are expected to have an intervention-time, the time of the military coup attempt, denoted "0", in June 2016, unless otherwise stated. The reason behind this choice is to avoid Ashenfelter's dip (Kaul et al. 2017). Moreover, the results are minimized from January 2016 until May 2016 to obtain the best possible match in the last months before the coup attempt. The original synthetic control case includes industrial production as a dependent variable, plus HUR and REER as predictors. To evaluate the effect on each predictor variable, the synthetic control is also conducted on HUR and REER alone. The results suggest that the coup attempt could have had an impact on the Turkish economy, but it was not significant on the industrial production in any case. When using the SCM on the unemployment rate solely, a significant result was obtained.

The initial thought was to include CPI as a predictor in the SCM. However, the treatment and synthetic effect proved to match poorly in the pre-intervention period. Even though the variable

still can be considered to contribute by allowing the synthetic control to generate a synthetic counterpart that has characteristics closer to Turkey's, the decision to omit it was made since the predictor did not affect the outcome of the synthetic control on industrial production substantially.

Table A displays the predictor balance obtained when conducting the SCM with industrial production as a dependent variable, accompanied by HUR, REER and CPI as predictors. It displays the predictors as averages of the industrial production, HUR, REER and CPI in the pre-intervention period, and corresponds to the fit between Turkey and the Synthetic Turkey, generated by the countries in the donor pool. Even though the method always will provide a synthetic counterpart that is as similar as possible to Turkey regardless of the predictors added, the variable CPI will be dropped. The reason is that the Synthetic Turkey appears quite far from the actual in this case. The discussion part includes further remarks regarding the exclusion of CPI.

Table of predictor balance of a synthetic control on industrial production, HUR, REER and CPI.

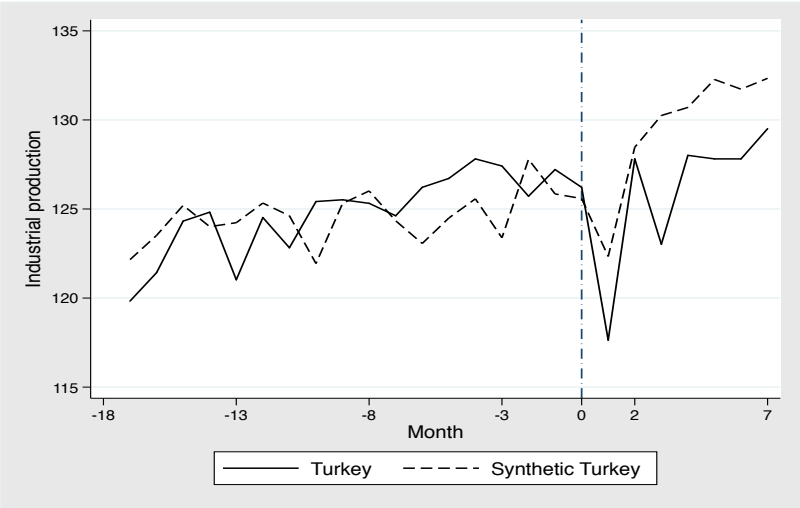
Predictor balance	**Turkey**	**Synthetic Turkey**
Harmonized unemployment rate	10.23529	9.255868
Real effective exchange rate	83.87882	102.5186
Consumer price index	**148.5278**	**112.7054**
Industrial production	124.7487	124.5713

Table A. *Source*: authors' calculations.

6.1 Industrial production and predictors

In this section, the corresponding weights and predictor balances are visible in Appendix A. It is organized so that the left-hand side (see Appendix A.1) shows the results from a synthetic control based on pre-intervention averages only, while the right-hand side refers to results based on pre-intervention averages and industrial production in three pre-intervention time intervals. The division into time intervals is made solely to illustrate how the dynamics of the SCM changes, and to make sure that the outcome is not too dependent on the matching on different months, as previously stated.

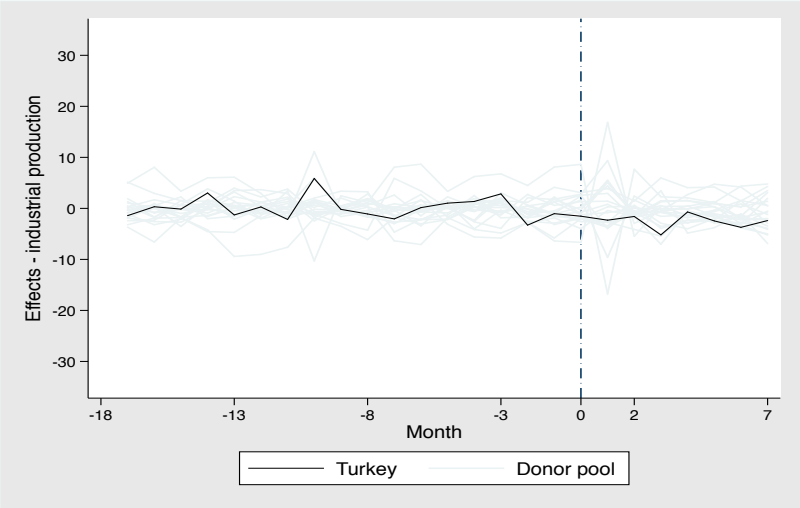
Starting with the left-hand side, the synthetic control matches the pre-intervention period in evenly, see Table 1. The RMSPE value of this synthetic control is 2.409622. Figure 1, of country weights, shows the distribution weights assigned to the countries in the donor pool for the synthetic control based on predictor pre-intervention averages. In this case, it puts largest weight on Estonia (52.9 %) followed by Slovakia (24.1 %) and Spain (17.7 %), meaning that these countries best replicate Turkey in this case.



Graph 1 of industrial production, pre-intervention averages. *Source*: authors' calculations.

To comment on the results, visible in Graph 1, they indicate that Turkey's level of industrial production has declined slightly as an effect of the military coup, and is clearly growing slower the synthetic counterpart in the post-intervention period. However, one must keep in mind that the results seem uncertain when it comes to the last months before the coup attempt, as the decrease in the Turkish industrial production is not fully replicated by the synthetic counterpart when comparing Turkey to the Synthetic Turkey. This fact could indicate that the result is likely to be biased in the post-intervention period, as the match of the last months in the pre-coup period are crucial to analyze potential outcomes after the coup attempt.

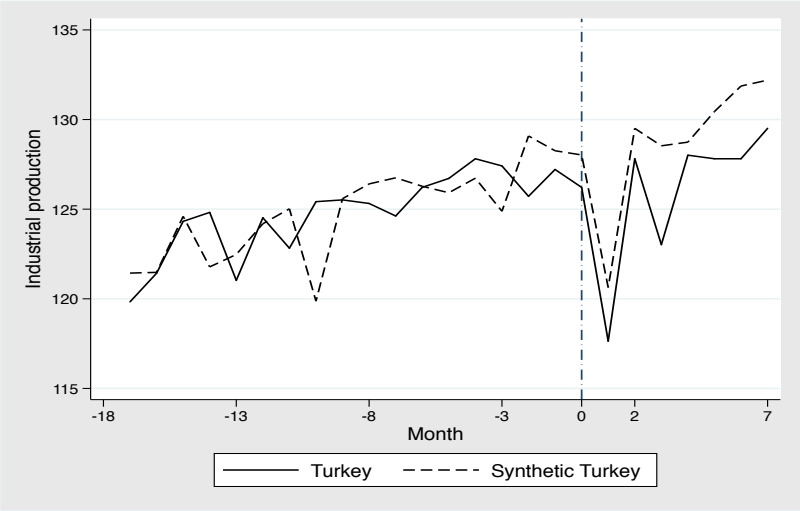
In terms of absolute magnitude, an in-space placebo test must be considered to analyze the result further. The result is visible in Graph 2, and further numbers are shown on the left-hand side in Appendix 1.1, see Graph A and Table 3.



Graph 2 of placebo tests. Industrial production, pre-intervention averages. *Source*: authors' calculations.

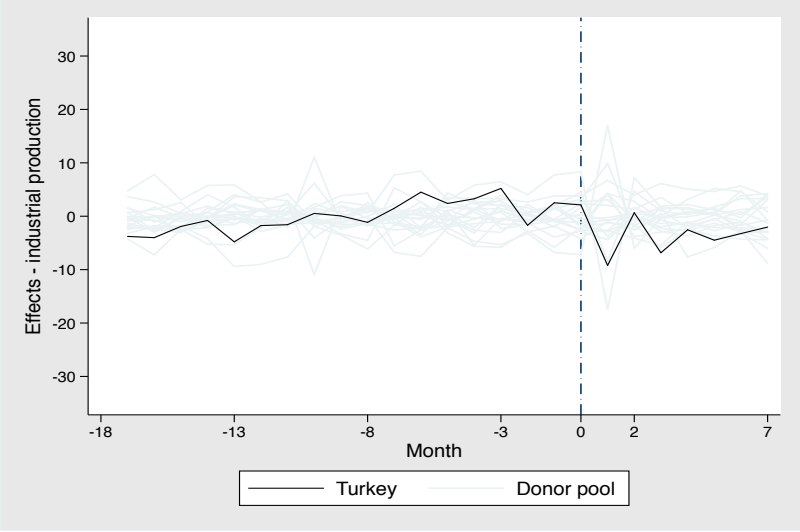
Since Graph 2 shows the effect of the synthetic control on Turkey, but also every other country in the donor pool, it is clear that the treatment has an effect on most countries in the donor pool as well. This can be interpreted from the lines referring to the donor pool, as they seem to prove a larger effect than that of Turkey. However, the effect on Turkey clearly appears to be the most negative one if compared to the placebo effects on the countries in the donor pool, that are typically positive. Still, it is not possible to draw further conventional conclusions regarding Turkey in this case, since the effect of the military coup attempt on the country cannot be stated as considerably large compared to assigning the same treatment to the countries in the donor pool. As noticeable in Table 3, the results cannot be considered significant, as 40 % of the countries in the donor pool display an effect at least as large as Turkey's.

Continuing with the right-hand side (see Appendix A.1), the result of a synthetic control using pre-period averages of HUR and REER as covariates, and industrial production is further divided into three pre-periods, specifically January-June 2015, July-December 2015 and January-June 2016 is observable. The choice of matching on dynamics of industrial production in is made to inspect eventual changes in pre-intervention matching and the post-intervention outcome, as argued before. In this case, a better matching in the last months before the coup attempt would simplify the analysis in the post-intervention period.



Graph 3 of industrial production, time intervals. *Source*: authors' calculations.

By observing Graph 3, the synthetic control seems to provide answers similar to those in the previous example, Graph 1, when only matching on pre-coup averages. The RMSPE is in this case 2.031503, indicating a slightly better match. However, now Poland, Figure 2, receives the largest country weight of over 40 %, followed by Slovakia, Hungary and Estonia. Alike the last result, this synthetic control predicts Turkey's industrial production in the post-intervention period to grow slower than the synthetic counterpart. This would imply that the coup attempt did have a negative influence on the industrial production in Turkey after the coup attempt. Nonetheless, this synthetic control provides a similar result in the placebo study, visible in Appendix A.1.1, Table 4 and Graph B.

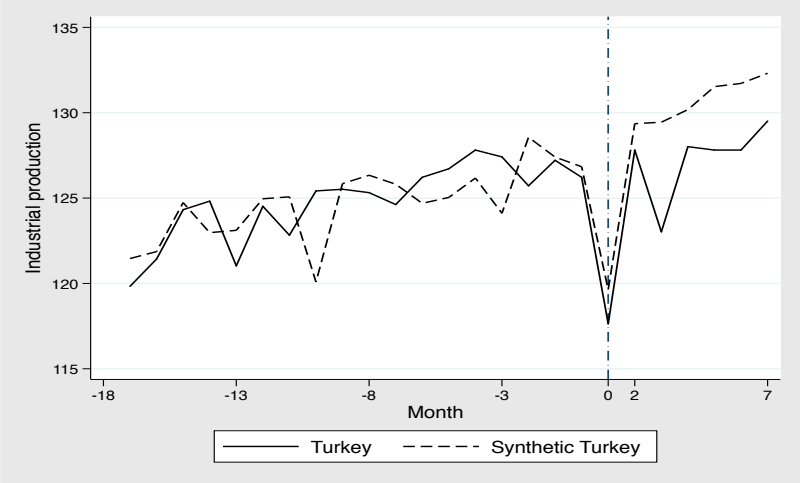


Graph 4 of placebo tests. Industrial production, time intervals. *Source*: authors' calculations.

Since the indicator of significance is quite low, and it is still visible that countries in the donor pool are displaying the same effect when assigned the same treatment as Turkey. Thus, we cannot say

that the effect of the military coup attempt on Turkey was considerably large, see Graph 4. Also, there is still not a perfect match in the last months before the intervention, indicating that the result might be biased.

To comment on the previous decision to change treatment month to June instead of July, it is beneficial to observe Graph 5. In other words, it illustrates the result when running a synthetic control on pre-intervention averages and changing the intervention month to July 2016, the month of the actual coup attempt. This generates an RMSPE of 2.016258, slightly lower than in both previous cases. However, as the donor pool is clearly closer to Turkey for this specific month, the method is probably replicating the military coup attempt incorrectly to the donor pool, generating a synthetic control match that is not desirable. Hereby the decision to change the month of the intervention to *June 2016*, denoted "0", as previously stated.

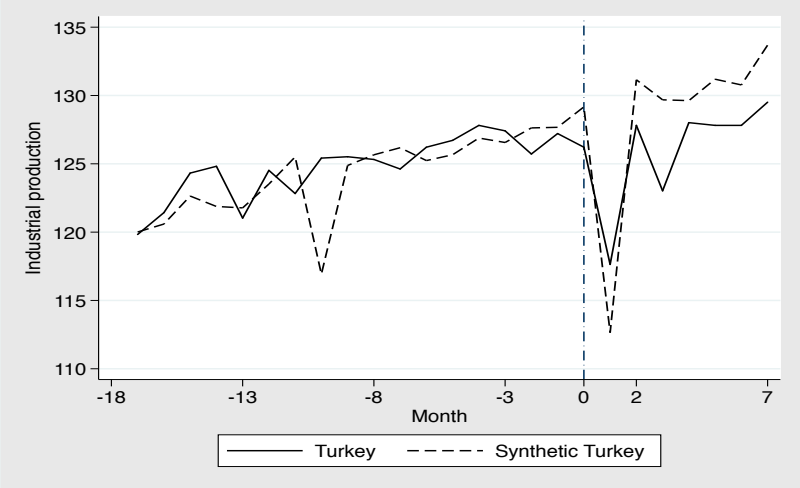


Graph 5 of change in treatment period. *Source*: authors' calculations.

To further analyze the change in outcome, and possibly improve the match in the last months before the intervention, the result from a synthetic control using pre-period averages of HUR and REER as covariates, but also all pre-intervention months of industrial production as additional predictors is visualized (Appendix A.2). Slovakia (48.4 %) and Czech Republic (51.6 %) now receive the largest country weights, Figure 3.

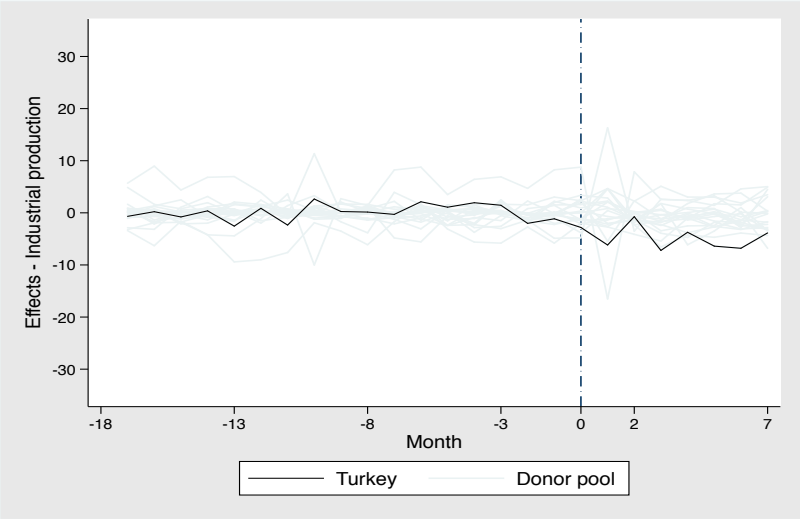
Matching on all pre-intervention months, as in this case, would according to Kaul et al. (2017) be beneficial if the model has shown to be relatively unaffected when changing the months of matching in the pre-intervention period. If so, the covariates might be completely unimportant for predicting the outcome of the dependent variable, and the synthetic control might arguably become even better when including all the pre-intervention months as separate predictors.

Apart from previous synthetic control studies, the results indicate that the synthetic country would have a larger dip in the intervention month, the coup attempt, but later it seems to be growing slower than the synthetic, as stated before. While using all the pre-intervention months of industrial production as predictors might do better when it comes to replicating, it can also come with a cost, since the covariate weights, as argued, will rely heavily on lagged outcome covariates rather than standard covariates.



Graph 6 of industrial production, all pre-intervention months. *Source: authors' calculations.*

Despite this, the result in Graph 6 does not seem to change considerably by comparing all outcomes on the industrial production synthetic controls, which might reduce the belief of the economic predictors affecting the outcome of the industrial production variable. The RMSPE is 1.144674, but even though the match indeed seems better, the last months before the intervention seem to be wrongly matched as the trend in the synthetic Turkey points upwards while the one of Turkey points in the opposite direction. When it comes to the significance level in accordance with a placebo test, it is still overly ambiguous to say anything about the effect of the military coup on the Turkish economy, Graph 7, Table 6 and Graph C (see Appendix A.2.1).

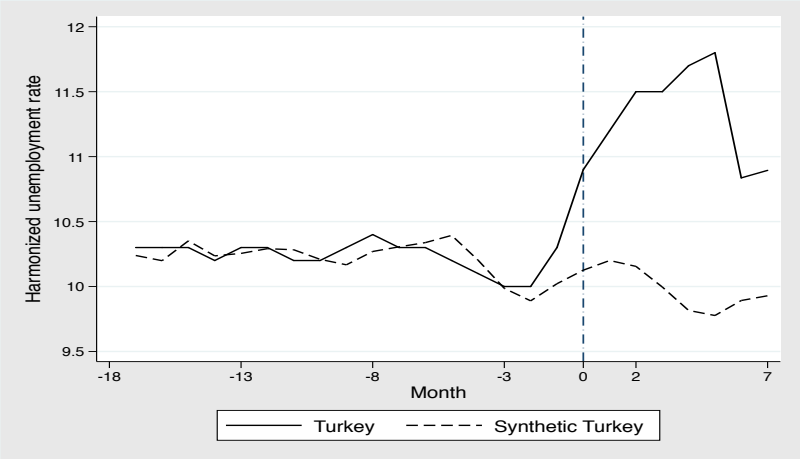


Graph 7 of placebo tests. Industrial production, all pre-intervention months. *Source*: authors' calculations.

6.2 Unemployment

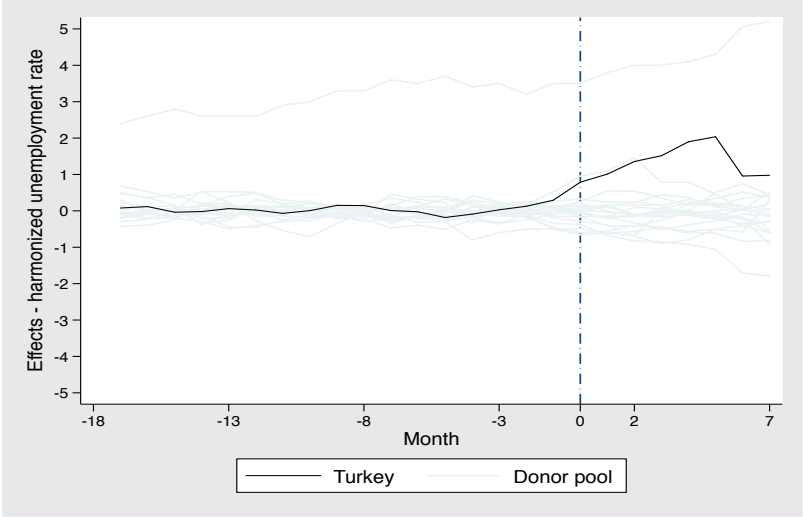
Continuing with the results on unemployment, only lagged values of the observations of it are used as predictors, in accordance with the theory of Nannicini and Billmeier (2013) stating that the pre-treatment fit can be improved by doing so. In contrary, this can cause bias if the dynamics when adding other economic predictors have not been investigated, as stated in Kaul et al. (2017). In this case, additional predictors must be overlooked, since the data available limits an analysis with additional control variables/predictors.

Appendix B.2 shows unemployment matched on three pre-intervention periods. Graph 8 provides the fit of the synthetic control, which is very evenly matched. The RMSPE is 0.1648948, and the countries with positive weights are in decreasing order Latvia, Austria and Greece, visible in Figure 5.



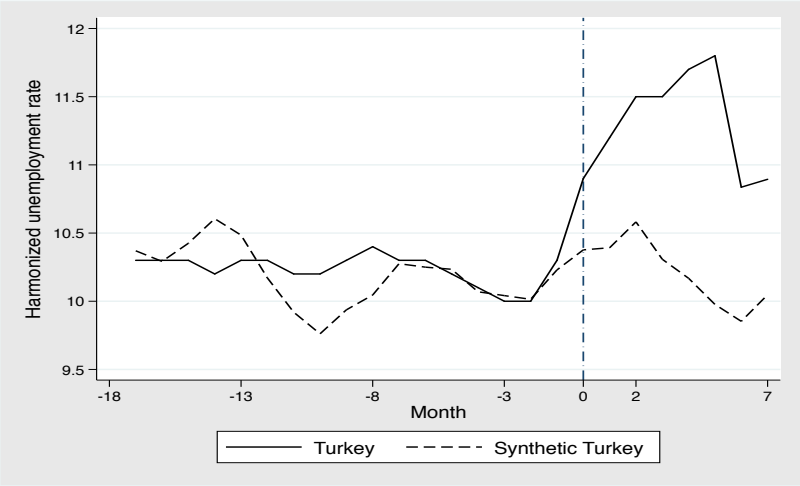
Graph 8 of unemployment, time intervals. *Source*: authors' calculations.

Even in this case, the synthetic control fails to predict the last pre-intervention month. However, the trends for Turkey and the Synthetic Turkey are quite similar, as both point upwards. Yet it is still possible to see an effect after the coup attempt, as the whole period is associated with a large increase in unemployment rate, while the trend for the synthetic counterpart is slightly negative or seems to be unaffected, speaking against the fact that the result would be considerably biased. This result is also highly statistically significant, meaning that the results when assigning the treatment to the other countries in the donor pool are not as large as Turkey's, see Graph 9, F and G plus Table 10 (Appendix B.2.1).

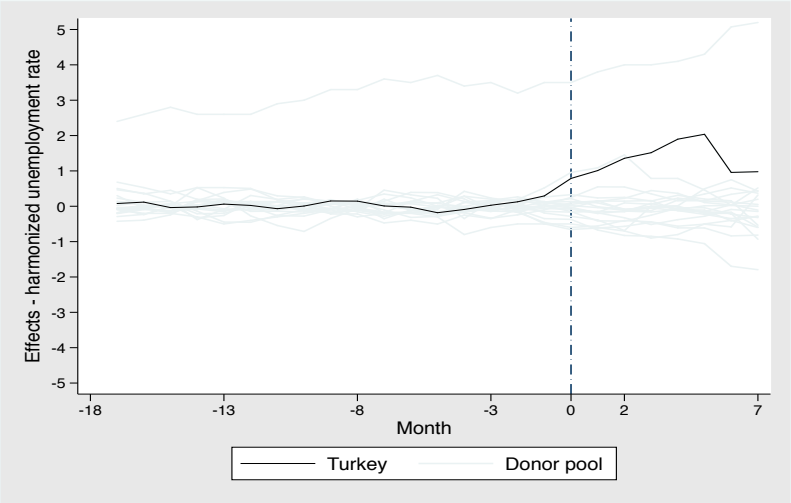


Graph 9 of placebo tests. Unemployment, time intervals. *Source*: authors' calculations.

If the predictors instead refer to all pre-intervention periods (see Appendix B.1), the result provides weight to Austria, Estonia and Greece, and predicts the pre-intervention period well. The RMSPE is 0.0422807. What is most convenient in this case is the fact that the last months before the intervention are very well predicted, which contributes with confidence in believing that the post-intervention outcome is predicted in a respectable way, see Graph 10. Concerning the outcome, it is similar to the prediction including three pre-intervention periods, but the absolute effect is still a little smaller. One possible cause is possibly the synthetic control being less biased due to the improved pre-intervention matching. With regards to the placebo tests, Graph 11 and Appendix B.1.1, the method seems to provide results with a better fit when matched on additional months in this case, as we observe significant results.



Graph 10 of unemployment, all pre-intervention months. *Source*: authors' calculations.



Graph 11 of placebo tests. Unemployment, all pre-intervention months. *Source*: authors' calculations.

6.3 Real effective exchange rate

Contradictory to the application of SCM to the HUR-variable, REER does not seem to provide as much explanatory power. According to the results, the match on REER alone is uneven (Appendix C). This corresponds to matching on both monthly intervals and all lagged values of the variable. In both cases, however, the REER in Turkey seems to have grown slower than its synthetic counterpart, but due to the low significance value of the tests, Appendix C.1.1 and Appendix C.2.1, it is hard to draw any reliable conclusions from it.

7 Discussion

In the following section, we will discuss the content examined in this paper. Core properties such as the choice of variables, donor pool, the results and the related significance will be described and critically assessed. We will also touch upon the choice of time periods and the decision to use high frequency data.

As stated, due to the fact that there has been less than a year since the coup attempt, and restrictions when it comes to available data for more than two quarters after the coup attempt, it was necessary for us to use high frequency data. As this circumstance makes the paper unique since none or very limited research have been conducted on the 15 July coup attempt, and as the relatively new SCM is used, it forms the most important limitation to our analysis.

Firstly, the small number of time periods in the post-intervention period restricts our ability to draw conclusions regarding causal effects of the military coup on the economy. For instance, some effects might appear much later, such as lagged effects on inflation, industrial production or GDP, somehow also preventing our result on industrial production to deliver any unique results for Turkey, if we assume that some effect should be noticeable.

Secondly, the limited availability to monthly data on a variety of variables and countries constrained the donor pool as well as the number of variables included. Variables such as a polity index on political violence or terrorist bombings could, for instance, favorably have been used to ensure that the effects observed on HUR were related to the coup attempt. It could be argued that these correspond to other effects, such as the aftermath of the coup, as described in the background, or due to other factors like the effect on unemployment due to the escalated conflict with PKK. Moreover, to improve the fit of the model, additional control variables that could have been included is for example the change in labor force and labor force participation rate. However, we failed to find monthly data on these variables for the control countries, which limited the analysis further. Consequently, we are very aware that the results need to be studied in the light of the limitations presented.

It is specified that the donor pool exclusively consists of OECD countries, because OECD is one of the few databases providing monthly data on the variables of interest. As OECD initially was an organization consisting of the European countries, United States and Canada, its members can

be considered a relatively homogeneous group, with regards to factors such as culture and advancement (with some exceptions among the emerging economies). Therefore, we have not been able to include various important factors characterizing Turkey that might have had an impact on our results, for instance its large Muslim population and related implications for the workforce into account. Our belief is that a more diverse set of countries and variables could have improved the goodness-of-fit in the pre-intervention period. Since we based the countries in the donor pool on levels of GDP (PPP) per capita and HDI, the results might be more biased than necessary, even though our initial thought was that the effect would be unimportant.

When it comes to the industrial production of a country, we are aware that it includes factors such as manufacturing, mining and utilities. Even though these sectors only contribute to a small fraction of the GDP, they are highly affected by interest rates and consumer demand. Hence, industrial production is an appropriate measure to forecast GDP and economic performance, therefore chosen in the paper. Even though using the industrial production in our SCM provided a very good fit in the pre-intervention period, it was somewhat surprising, that the effect was not significantly high for Turkey, facing the military coup in July. One reason for this could be the lack of data, but it is definitely more likely that the immediate actions taken by the CBRT, combined with an increased domestic demand and increased exports, reduced the effect on the economy, . In fact, Turkey's GDP grew by 5 % in the first quarter of 2017 compared to the same period last year, exceeding forecasts according to figures from the Turkish Statistical Institute TÜİK, Hürriyet (2017). This may be considered as an indication that the coup attempt did not affect the economy significantly, unlike earlier successful coups in Turkey.

We chose to use the harmonized unemployment rate since it is more internationally comparable than national estimates. Here, unemployment is defined as people of working age but that are available to work and have taken specific measures to find a job. The indicator is seasonally adjusted and is measured in numbers of unemployed people as a percentage of the labor force. The labor force in turn is defined as the number of unemployed people plus people in civilian employment, and civilian employment is relatively common in Turkey, especially among the less educated female population. It is also relatively common with unregistered employment.

By using the SCM, we observe a significantly large increase in the Turkish unemployment after the military coup. It is reasonable to assume that the government's purge against people that were believed to be connected to the Gülen-movement is reflected in the increase in the unemployment rate.

However, a share of the increased HUR might be attributed to an increase in the LFPR during the same period. Therefore, we cannot rule out that the change in unemployment due to the military coup attempt given our synthetic control study could be somewhat overestimated. A possible explanation is that job creation failed to keep up with people looking for employment.

The Bathtub Model of Unemployment exemplifies this situation, and the dilemma related to it. Here, the inflow into the stock of unemployed workers is higher than the outflow, resulting in an increased unemployment level. The dilemma lies in the fact that we cannot say for sure where the inflow comes from, that is, whether it is connected to people losing their jobs due to the coup attempt or the increased rate of participation by people that were previously not a part of the labor force. At the same time, the effect on Turkey was significantly larger than the effect on the other countries in the control group, at this exact period, which must be considered reassuring.

One variable that is often mentioned when analyzing the economic development of a country is the inflation. The poor matching between our treatment unit and our synthetic counterpart in the pre-intervention period made us question whether to include CPI in our synthetic control. The reason for the poor matching is most likely explained by the much higher inflation level in Turkey compared to the other countries in the donor pool, by analyzing data from OECD for the selected time. This problem could also be solved if the donor pool included other countries than only OECD members, since including countries with higher inflation levels would have improved the distribution around Turkey's CPI level and thus the matching in the pre-intervention period.

As mentioned in the beginning of this paper, the Turkish economy has faced various shocks during 2016, all of them not being tied solely to the coup attempt. The negative shock on tourism hit the economy hard last year, and have generated spill-over effects on the transportation-, food- and accommodation sector. The narrow access to high-frequency data have limited our ability to analyze effects on these sectors, even though they account for a significant share of the economy. Furthermore, we have not been able to distinguish between effects on the variables analyzed related to the coup attempt and other events, such as the political conflict with Russia or the increased number of terror attacks since the interruption of the cease-fire with PKK in 2015, that could have caused lagged effects.

7.1 Structural changes in Turkey

The main long-term, structural changes that came with the coup attempt was changes within the military. During the AKP-rule, Turkey, with the support of the European Union has long worked to reduce the power of the military and to put the military under the rule of the government and law. Despite all earlier structural changes of the military carried out by the AKP a coup attempt was made anyway. This indicates that there is still a will of fractions of the army, which is claimed by the government to have connections to the Gülen movement, to rule over the government. After the coup attempt, the government decided to carry out further structural changes within the army as a precaution against a new coup-attempt. These changes include the Interior Ministry's decision to take control over the gendarmerie and the Coast Guard. The Gendarmerie is now separated from the forces, and will operate with the military only in cases of emergency. An article by the Hürriyet Daily News (2016) states that combined with the effect from the large suspension of military personnel, the personnel figures have fallen from 518,166 at the end of June 2016 to 355,212 at October 5th, 2016 according to the official website of the Turkish military (TS). Moreover, the predicted time in service of officers have decreased from 31 years to 28 years. This is an indication that Turkey is heading into a new era, where the military who has long been considered the guarder of the state ruling above law, is now sharply taken under control, is losing its earlier high status over civil rule for good.

We cannot end this paper without mentioning that the conditions for people working or indicating to work within the state institutions have changed. Very extensive controls made of all workers within the machinery of state are now made, which according to the government is an effort to reduce the possibility of people with connections to the Gülen movement to infiltrate state institutions. The government claims that the security controls made are a part of the investigation against the Gülen movement in Turkey and taken as a step to reduce the possibility of further coups and coup attempts. However, it is likely that this will have a long-term effect on application procedures and caution needed to be taken among personnel working within the institutions to avoid connections with the broadly spread Gülen movement.

8 Conclusion

Broadly, we can observe an effect on the Turkish economy after the coup attempt based on the analysis made with the SCM. On the one hand, industrial production and the predictors used do provide seemingly robust results, as they do not change considerably when altering the predictor dynamics. Though the fit in the pre-intervention period changes somewhat, the outcome in the post-intervention period remains quite similar. However, as the same effect is visible for many countries in the control group as well, it brings doubt to the analysis and its true effects.

By investigating the HUR and the REER as well, we do observe an effect by using the SCM on the HUR, but not on the REER. As argued, a shortage of data and possible control countries available to analyze might have affected the outcomes. Nevertheless, the significantly large increase in the unemployment rate, up to about 1.5 % in Turkey compared to the synthetic counterpart seems to be valid, as almost no other country in the control group faced the same effect in our placebo study.

However, due to limited availability to high frequency data, a short time period and a restricted donor pool the main results are hard to interpret with exact precision, but it can provide guidelines for what the military coup attempt instigated in the country. Despite this, it is also difficult to rule out that other shocks to the economy, such as the effect of lost tourism due to the diplomatic crisis with Russia, and the increased labor force participation rate during the same period may have effected these figures. When it comes to the overall model, however, it is interesting that the results seem robust since they do not change dramatically even though changing what months they are matched on. Regardless, there is a possibility that the coup-attempt will show lagged impacts on industrial production, and therefore might be visible in the future. Consequently, we recommend recreating this study when more data is available, and it is possible to add more predictors to the SCM. If done successfully, more general results could be drawn, paving the way for a profounder understanding of the economic effect of the coup-attempt in Turkey.

Finally, the coup-attempt has also lead to larger, structural changes within the Turkish society, and especially within the Turkish Military. Fractions of the military earlier connected to the Turkish Armed Forces, such as the Gendarmerie are now operating under the Interior Ministry, indicating a greater control over the military by the civil state. The number of military personnel in Turkey,

known for being the second largest army of all NATO members, have decreased. The conditions for employment within the state have also changed, as security controls became a lot more extensive after the coup-attempt, affecting things such as the application-process and the caution needed to be taken by employees to avoid connections to the Gülen movement. These are effects we believe will be persistent in the longer term.

9 Summary

Military coups are undoubtedly interesting events to study, and when it comes to economic outcomes, much remains to be discovered. However, by isolating a small fragment out of all possible effects, and analyzing it with the synthetic control method, interesting outcomes have been observed. These are both relevant today, and to further investigate when even more data on the event is available. Except from finding an effect of the military coup attempt on unemployment, the dynamics of the synthetic control method have been investigated.

The purpose of the paper was mainly to add to the absence of studies on the military coup attempt in Turkey 2016. By doing so, relevant results hoped to be attained. Through assessments of industrial production, the real effective exchange rate and the harmonized unemployment rate, this could be achieved. Though no reassuring effects on industrial production were visible, the most significant result was an increased unemployment rate in the period after the coup compared to the synthetic counterpart by 1 % on average.

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Appendices

Appendix A Industrial production

Appendix A.1 Averages and time intervals

Predictor balance	Treated	Synthetic
Harmonized unemployment rate	10.23529	10.12418
Real effective exchange rate	83.87882	97.85879
Industrial Production	124.7487	124.5185

Table 1

Predictor balance	Treated	Synthetic
Harmonized unemployment rate	10.23529	8.172053
Real effective exchange rate	83.87882	96.75191
Industrial production month 1-6	122.6574	122.6578
Industrial production month 7-12	124.9854	124.9854
Industrial production month 13-17	126.9743	126.9742

Table 2

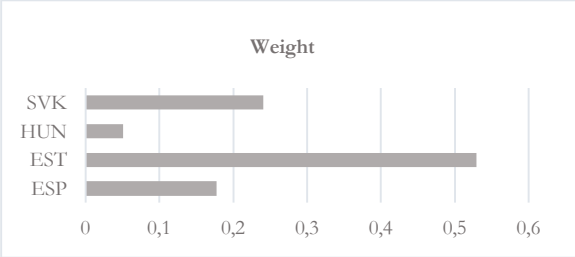


Figure 1

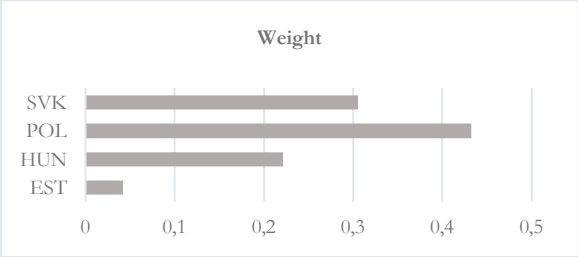
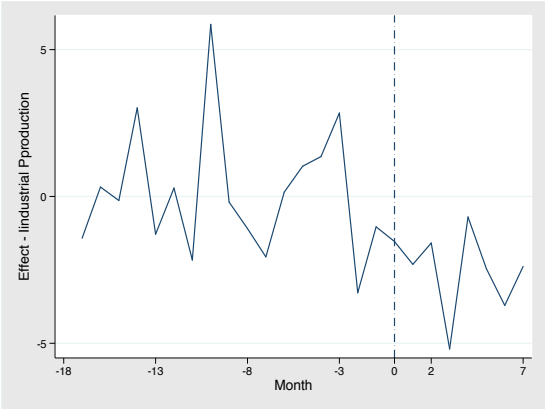
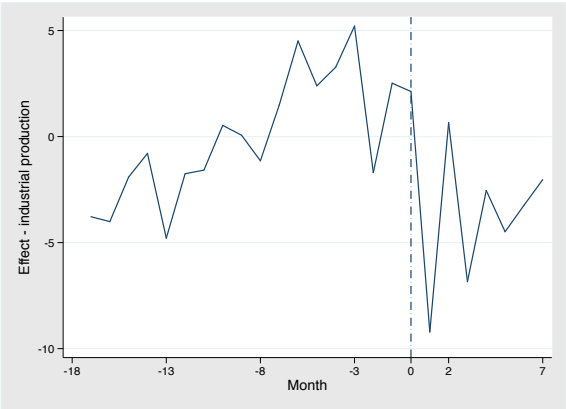


Figure 2

Appendix A.1.1 Placebo results



Graph A



Graph B

Scalars industrial production, real effective exchange rate, harmonized unemployment rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.2
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0.4
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.15

Table 3

Scalars industrial production, real effective exchange rate, harmonized unemployment rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.5
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0.6
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.35

Table 4

Appendix A.2 All pre-intervention months

Predictor balance	Treated	Synthetic
Harmonized unemployment rate	10.23529	7.8344
Real effective exchange rate	83.87882	100.5951
Industrial production month 1	119.8304	120.0087
Industrial production month 2	121.4268	120.5912
Industrial production month 3	124.3203	122.6414
Industrial production month 4	124.8192	121.8779
Industrial production month 5	121.0277	121.7745
Industrial production month 6	124.5198	123.5171
Industrial production month 7	122.8236	125.5041
Industrial production month 8	125.4178	116.9276
Industrial production month 9	125.5176	124.88
Industrial production month 10	125.318	125.6592
Industrial production month 11	124.6196	126.1776
Industrial production month 12	126.216	125.2359
Industrial production month 13	126.7149	125.6626
Industrial production month 14	127.8124	126.8846
Industrial production month 15	127.4133	126.5594
Industrial production month 16	125.7171	127.6263
Industrial production month 17	127.2138	127.6712

Table 5

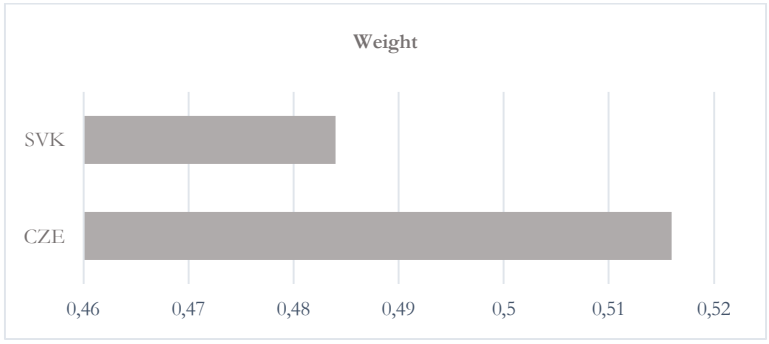
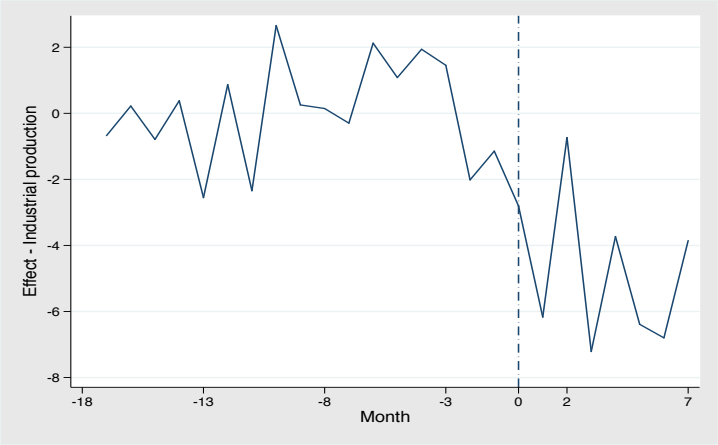


Figure 3

Appendix A.2.1 Placebo results



Graph C

Scalars industrial production, real effective exchange rate, harmonized unemployment rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.1
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0.15
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.3

Table 6

Appendix B Unemployment

Appendix B.1All pre-intervention months

	Treated	Synthetic
HUR month 1	10.3	10.3699
HUR month 2	10.3	10.2922
HUR month 3	10.3	10.4253
HUR month 4	10.2	10.6052
HUR month 5	10.3	10.4848
HUR month 6	10.3	10.1711
HUR month 7	10.2	9.9195
HUR month 8	10.2	9.7612
HUR month 9	10.3	9.937
HUR month 10	10.4	10.0459
HUR month 11	10.3	10.2752
HUR month 12	10.3	10.25
HUR month 13	10.2	10.2344
HUR month 14	10.1	10.0694
HUR month 15	10	10.0414
HUR month 16	10	10.0143
HUR month 17	10.3	10.2299

Table 7

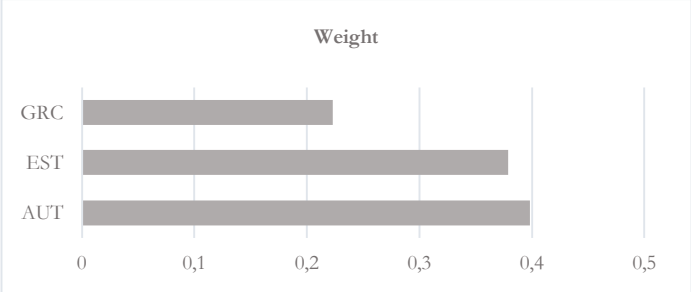
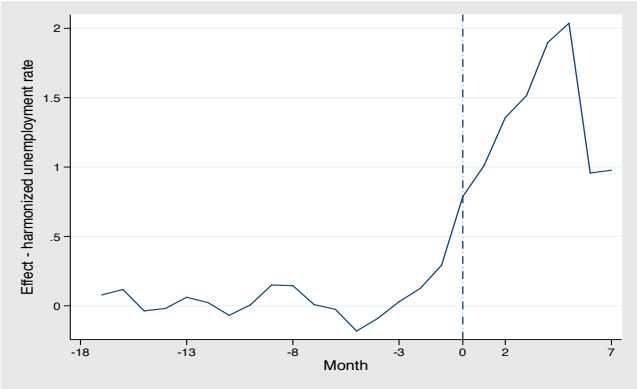
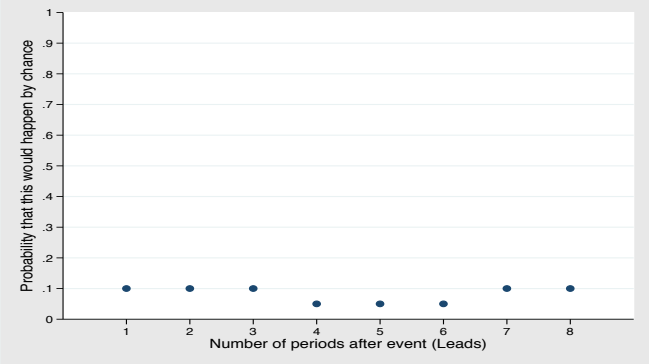


Figure 4

Appendix B.1.1 Placebo results



Graph D



Graph E

Scalars harmonized unemployment rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.05
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.9

Table 8

Appendix B.2 Time intervals

Predictor balance	Treated	Synthetic
Harmonized unemployment rate month 1-6	10.28333	10.26186
Harmonized unemployment rate month 7-12	10.28333	10.26207
Harmonized unemployment rate month 13-17	10.12	10.0988

Table 9

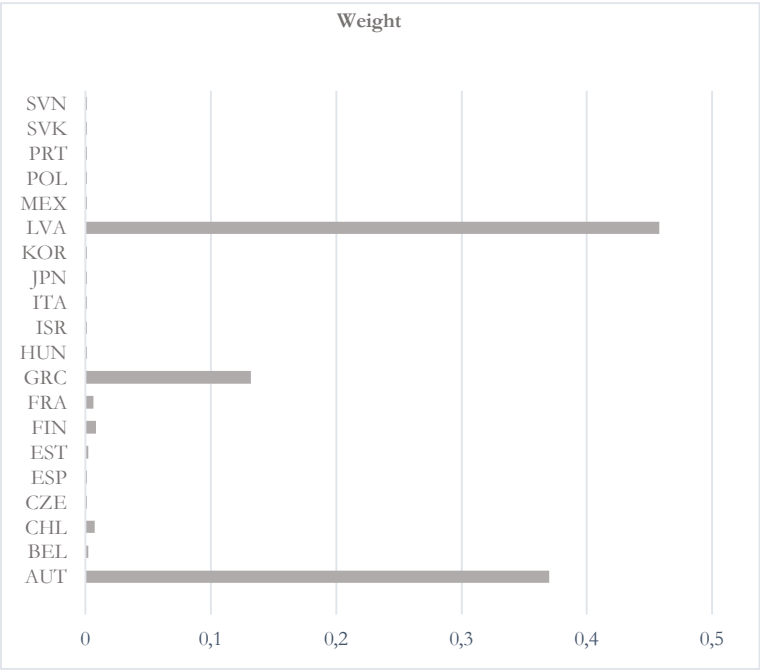
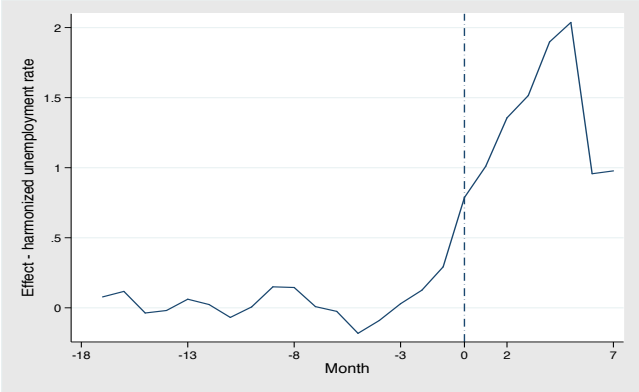
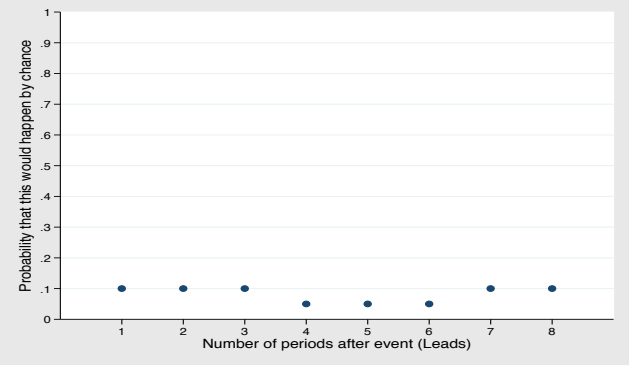


Figure 5

Appendix B.2.1 Placebo results



Graph F



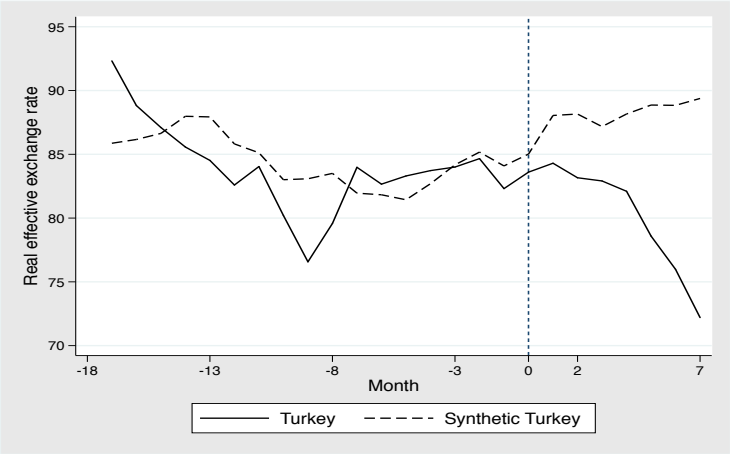
Graph G

Scalars harmonized unemployment rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.05
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.9

Table 10

Appendix C Real effective exchange rate

Appendix C.1 Time intervals



Graph H

Predictor balance	Treated	Synthetic
Real effective exchange rate month 1-6	86.82	86.73153
Real effective exchange rate month 7-12	81.17167	83.0821
Real effective exchange rate month 13-17	83.598	83.51246

Table 11

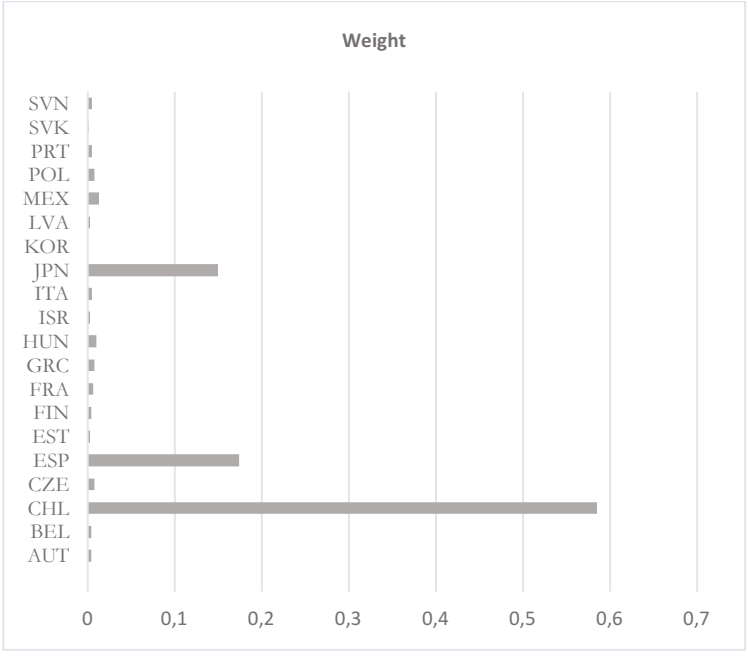
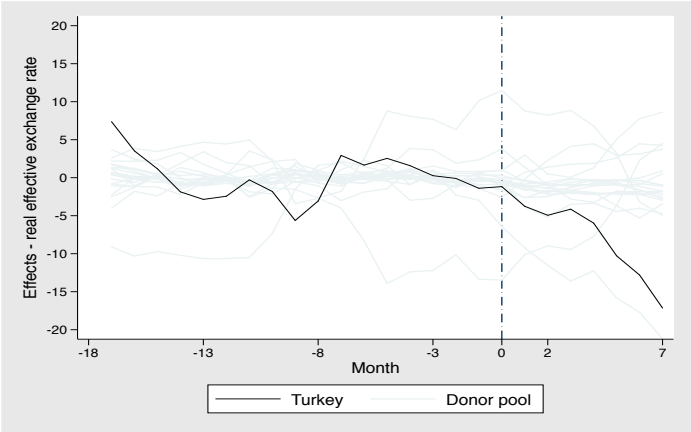
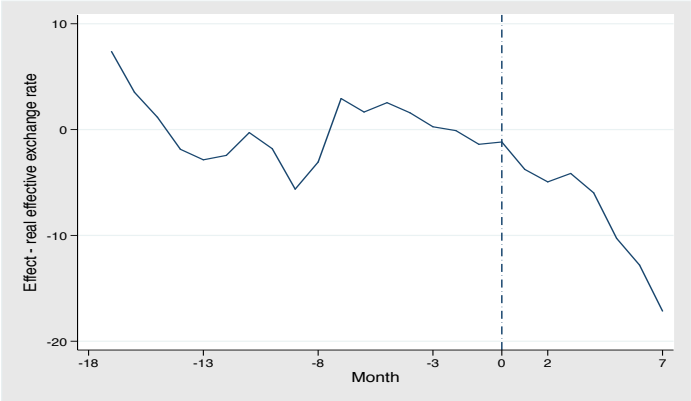


Figure 6

Appendix C.1.1 Placebo results



Graph I

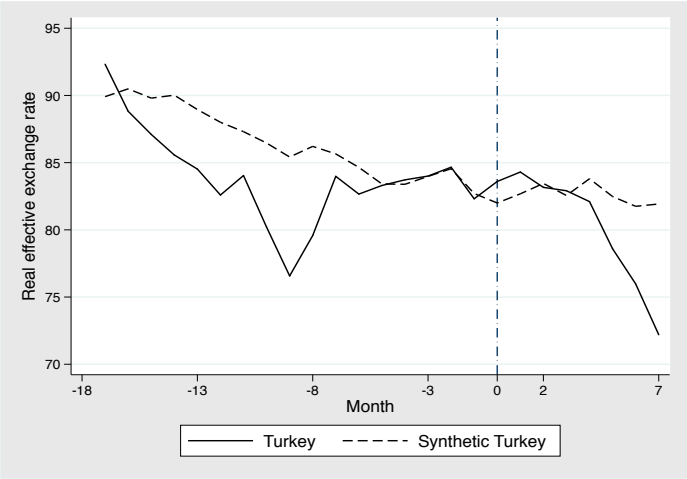


Graph J

Scalars real effective exchange rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.05
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0.2
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.1

Table 12

Appendix C.2 All pre-intervention months



Graph K

Predictor balance	Treated	Synthetic
REER month 1	92.32	89.91118
REER month 2	88.82	90.49121
REER month 3	87.1	89.80034
REER month 4	85.57	90.02074
REER month 5	84.52	88.95177
REER month 6	82.59	88.00338
REER month 7	84.04	87.30713
REER month 8	80.2	86.45841
REER month 9	76.57	85.41779
REER month 10	79.58	86.21112
REER month 11	83.98	85.64909
REER month 12	82.66	84.6497
REER month 13	83.3	83.41481
REER month 14	83.72	83.38864
REER month 15	84	83.97772
REER month 16	84.66	84.54759
REER month 17	82.31	82.7017

Table 13

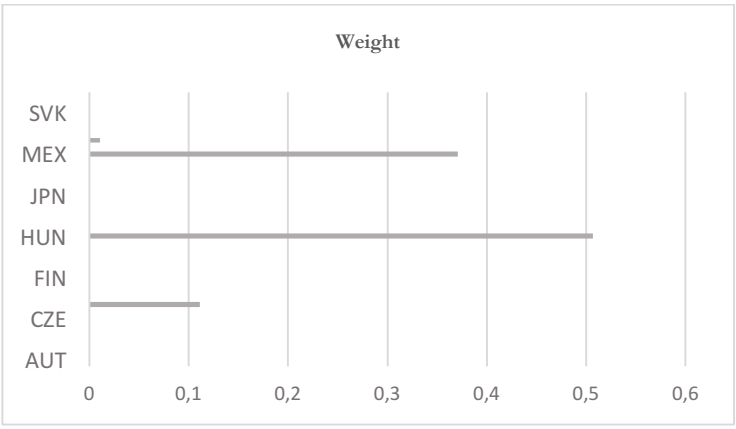
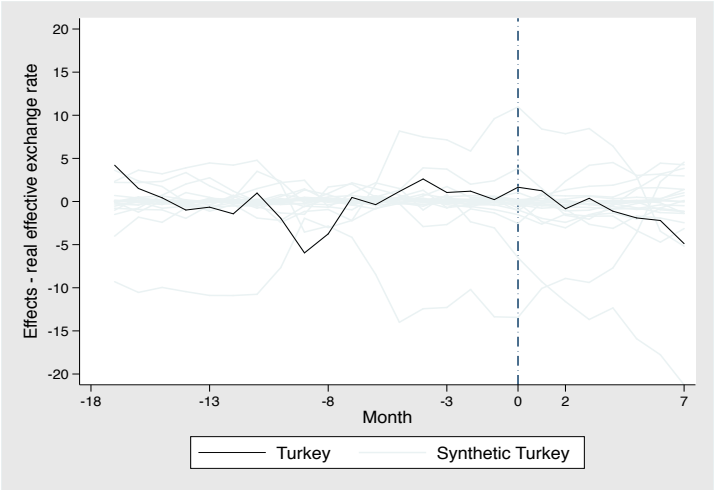
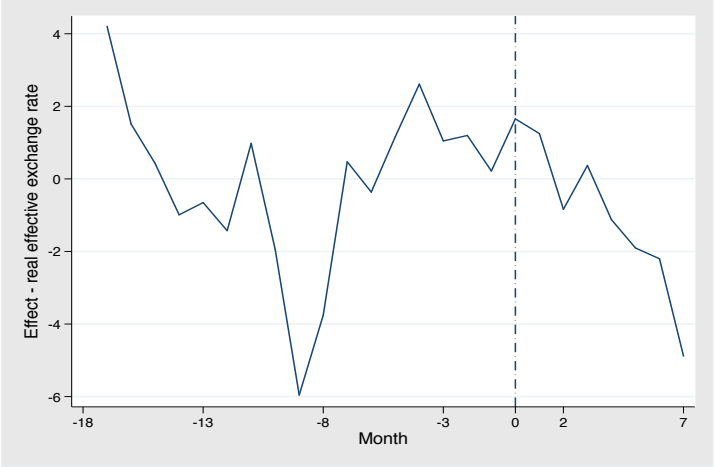


Figure 7

Appendix C.2.1 Placebo results



Graph L



Graph M

Scalars real effective exchange rate	
Number of placebo averages	20
Number of placebo averages used	20
Proportion of placebos with RMSPE at least as large as Turkey's	0.35
Proportion of placebos with a post/pre-period RMSPE at least as large as Turkey's	0.95
Proportion of placebos with a pre-period RMSPE at least as large as Turkey's. Indicator of significance	0.1

Table 14