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Capital Controls in Greece: Effects in consumption and imports using the synthetic control method

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## **Abstract**

This paper studies the implementation of capital controls in Greece and examines their impact on consumption and imports. The dataset consists of the quarterly country-level macroeconomic variables, per capita final consumption expenditure of households, per capita imports of goods and services and per capita exports of goods and services, of 10 countries for the period 2010-2016. The method applied and aiming to estimate the effect of capital controls is the synthetic control, which is based on the existence of an intervention of interest. Synthetic control method separates the timeline in pre- and post-capital controls periods and categorizes the countries in treated and untreated, and, using the characteristics of the untreated in the pre-intervention period, it creates a counterfactual that represents the trajectory of the treated country in the absence of the intervention. After applying the synthetic control twice, using consumption as the outcome variable at the first application and imports at the second, the findings show that there is a short-term negative effect of capital controls on both consumption and imports in Greece.

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## **1. Introduction**

After the global financial crisis of 2008, the world economy starts to regenerate, creating capital movements back to emerging countries. Such capital flows, usually, help countries with fewer savings to attract foreign investors, promote the diversification of investment risk, foster intertemporal trade and help financial markets develop (Ostry et al., 2010). These capital movements can be inflows to a recipient country or outflows from a source country. However, these capital flows usually occur in surges and therefore they need to be controlled by the competent authorities so that they do not provoke instability to the economy.

In Greece, capital controls were introduced at the end of June 2015 with the aim to halt the run of citizens on bank deposits, provoked by the instability of the political system (Samitas & Polyzos, 2016). The European Central Bank, affected by the European debt crisis, froze the financial support towards the banks of Greece which resulted in the closing of the above-mentioned institutions and consecutively in the implementation of capital controls, whose purpose was the prevention of Greeks' run to the banks (www.investopedia.com, 2017). These measures are still valid in Greece, although the restrictions are substantially relaxed, causing inconveniences in bank transactions and credit card payments. The regulations concern purchases with credit cards, which were impossible during the first period of the implementation, foreign financial transfers and daily cash withdrawals. At first, the maximum amount a citizen could withdraw was 60 euros per day; subsequently it switched to 420 euros per week until recently, since when the limit has been 840 euros per fortnight. Such measures can lead to a plummet of consumption expenditure since individuals who prefer cash from alternative methods of payment, which is a usual phenomenon in Greece, cannot have access to their desirable amount of cash and therefore cannot proceed to purchases. Generally, the banking capital controls imposed in Greece concern the outflow of funds, and constitute a regular policy tool in emerging countries, limiting the cash circulation only inside the country (Samitas & Polyzos, 2016). Such regulations can have a negative effect on imports, as exporting countries are not guaranteed their payments so they may postpone their shipments or, even worse, cut off the trade routes.

Capital controls are measures imposed by the government of a country in order to restrict capital inflows and outflows from the capital account of the country. They can be applied to all flows,

such as debt (bonds) and equity (stocks), and they vary depending on the type of the flow or its duration: short-, medium- or long-term (www.investopedia.com, 2017). The limitations to capital inflows can be in the form of specific instruments that aim to lessen capital flows into a specific industry or sector of an economy or into the economy in general (Buss, 2013). The different types can be exchange controls, taxes on foreign goods and services known as tariffs, transaction taxes (Tobin tax), definite prohibitions and volume limitations as well as restrictions on the amount of money that citizens can move out of a country (www.investopedia.com, 2017). Additionally, capital controls are not homogeneous since regulations on inflows and outflows are “policy tools with different purposes” (Andreasen, Schindler & Valenzuela, 2017). As Magud, Reinhart & Rogoff (2011) aptly state “Capital controls are a single policy instrument but there are many policy objectives”. Therefore, the existence of different kinds of restrictions means that we have different effects in financial markets, which implies that studies that use aggregate indices of capital controls may hide some asymmetries that render the estimation of average effects difficult, if not impossible (Andreasen, Schindler & Valenzuela, 2017). Since previous literature has proven that it is difficult to estimate average effects of capital controls, it is better to focus on each instance when capital controls are introduced separately, as this paper does with the case of capital controls in Greece.

Capital controls induce controversial effects and this has created debates among the academics. The previous literature describes the effects of capital controls providing theoretical and empirical evidence that yields mixed results, rendering debates necessary and inevitable (Buss, 2013). How effective capital controls can be depends on whether a country has already existing restrictions and thus the administrating procedure is already completed, whether an economy has closed capital accounts and consecutively it is easier to enforce restrictions and whether a country has open capital accounts, implying that it is necessary to design and introduce new regulations and make them stricter over time (Ostry et al., 2010). Capital controls may have potential positive effects from a macroeconomic perspective; nevertheless they restrict companies from having full access to foreign capitals, providing one more reason to the academics for showing that capital account restrictions are disastrous to financial markets and economic development (Andreasen, Schindler & Valenzuela, 2017). Furthermore, the impact of controls on capital outflows is ambiguous as on the one hand they restrict the movement of

national savings to foreign financial markets thus decreasing the cost of domestic financing whereas on the other hand they decrease the risk diversification ability of a company and in that way they reduce its investing options (Andreasen, Schindler & Valenzuela, 2017). According to the economic theory, capital controls may have dire consequences such as the decrease of capital supply, the raise of financing cost, the raise of financial regulations to domestic firms which do not have direct access to foreign capital markets (Blundell-Wignall & Roulet, 2014). Apparently, previous literature has focused on the effects of capital controls on financial markets. However, the aim of this paper is to assess how capital controls affect the aggregate economy, *id est* consumption and imports.

One of the fundamental purposes of the International Monetary Fund (IMF) was to promote the abolishment of foreign exchange controls that delay the evolution of global trade. Maintaining capital controls was not considered against this objective as such regulations were assisting in the establishment of fixed exchange rates and were consecutively favoring trade (Tamirisa, 1999). The way that exchange and capital controls affect world trade is a function of how well structured and effective the controls are and how they interact with other regulating policies in the economy (Tamirisa, 1999). Exchange controls work as taxes on foreign currencies which are necessary for purchasing foreign goods and services and additionally they raise the domestic price of imports, thereafter they decrease trade. Furthermore, as Tamirisa (1999) refers, capital controls influence the trade of goods by reducing intertemporal trade and portfolio diversification. What is worth mentioning is that exchange and capital controls often increase transaction and other related to trade costs, resulting in the decline of trade (Tamirisa, 1999). It is noticeable that there is an important, yet ambiguous, connection of exchange and capital controls with trade, which makes the empirical evidence about it critical but also limited. Moreover, trade is reduced when the transfer of technology and managerial skills is limited due to foreign direct investment. Tamirisa (1999) also notes that capital controls frequently decrease business opportunities for hedging foreign exchange risks and financing trade, thus inhibiting trade. The terms of trade effect are not conspicuous and relate to the differences that occur in patterns of consumption and production levels of source and recipient countries. As a matter of fact, these effects are likely unimportant and they are usually compensated by capital flight and reduced

capital inflows due to capital controls, which can justify the limited empirical support of previous discussions (Tamirisa, 1999).

This paper studies the effects of capital controls in Greece on per capita final consumption expenditure of households and on per capita imports of goods and services, using the synthetic control method. Synthetic control estimates the effect of an intervention in a panel data setting, where the outcome of interest is observed for one treated unit and several control units, for several periods before and after the intervention. This method addresses interventions which occur at a macroeconomic level, affecting aggregate entities such as countries; therefore the implementation of capital controls in Greece fits this description perfectly.

Motivated by Abadie, Diamond & Hainmueller (2010), I describe a traditional synthetic control model which is based on the difference-in-differences framework with linear panel data, allowing the variation over time of the effects of unobserved variables on the outcome. The synthetic control method is applied twice to estimate the effects of the implementation of capital controls in Greece, in late June 2015, on both per capita final consumption expenditure of households and on per capita imports of goods and services. The findings show that for a short period after the implementation, the volume of consumption and imports decreases significantly in Greece, compared to the control group. Subsequently, they both recover and while consumption continues with an upward trend, imports do not experience the same. This short-term negative effect of capital controls can be attributed to the limitations in cash withdrawals as well as to the exclusive cash circulation only inside the borders of the country. Furthermore, there is no apparent long-term effect of capital controls, since both variables recover after the sharp decline.

The remainder of this paper is structured as follows. Section 2 presents the historical background of capital controls. In section 3, previous literature with focus on capital controls is examined. Section 4 describes the data and the sample used in the research. Section 5 describes the methodology and the model applied in the analysis, the results of which are mentioned in section 6. Section 7 concludes.



## **2. Background**

Over the past, the financial crises were followed by capital control implementations. The first use was back in the World War I while capital controls were also used at the Bretton Woods system, which was founded after World War II (Tamirisa, 1999; Ghosh, Qureshi & Sugawara, 2014). In the Bretton Woods conference of 1944, where the International Monetary Fund was established, the basic connection between exchange and capital controls and international trade was defined (Tamirisa, 1999). One of the purposes of the IMF was to assist in the abolishment of foreign exchange regulations that slow up the development of global trade (Tamirisa, 1999).

During the recent years, several experiments have been conducted with regulations on capital flows by applying a diversity of instruments, as described in Cardoso & Goldfajn (1997). More specifically, in the mid-1990s Venezuela's response to capital outflows was to implement exchange controls to confine the current and capital account transactions. Furthermore, in early 1996 Romania's reaction to the payments crisis was to shut down the foreign exchange markets. At the same period, South Africa detained the cancellation of existing exchange controls on the capital outflows of its habitants. In the 1990s, Brazil increased the financial transaction tax to avert inflows and in late 1994 its reaction to peso crisis in Mexico was to prohibit the prepayment of foreign loans and to relax some of the capital inflow restrictions. Cardoso & Goldfajn (1997) cite last the case of Chile as it is generally considered successful. In particular, in mid-1990s Chile inserted a stamp duty, stretched the tax base to all foreign loans and set a one-year minimum maintenance period for foreign capital inflows. It is a case where capital controls were successful in changing the synthesis of inflows to liabilities, according to Ostry et al. (2010), who mainly emphasize the effectiveness of controls in economies with complete systems of regulations in most types of flows.

In our days there are modern situations of capital controls in Malaysia, Iceland, Cyprus and lately in Greece, where the case is rather different. While in the aforementioned countries what caused the necessity of capital controls implementation was the financial crisis itself, in Greece the financial crisis that yielded the capital controls was a result of a chronic fiscal and political crisis (Samitas & Polyzos, 2016).

### **3. Literature Review**

Hitherto literature has focused on the effects of restrictions on capital inflows and capital outflows and has yielded mixed results. Hence, there have been many times where, due to these controversial effects, researchers participated in debates in order to clarify the most representative answer.

Several researchers focused on capital controls and their connection to the stock market. More specifically, Buss (2013) wanted to estimate the effect of capital controls to exchange rates and to the volatility of stock market as well as the unfavorable consequences of their implementation on foreign exchange and on the welfare of the economy. He provided evidence that the use of transaction taxes on capital inflows has vague impact on the financial stability. According to Andreasen, Schindler & Valenzuela (2017) the majority of empirical research regarding capital controls is focused on stock markets. They show that limitations in capital inflows generate an important rise in corporate bond spreads and that the effect of such restrictions is quite notable in more financially restricted firms. Also, when the bonds are issued by bigger companies or by those activating in specific economies, then the spreads are less vulnerable to controls on capital inflows. This impact is enlarged in periods of financial distress and market illiquidity. Andreasen, Schindler & Valenzuela (2017) are considered the first that use bond-level data to examine the effect of capital controls on corporate credit spreads. They show that capital controls have an important impact on the cost of international debt capital for firms, different for the various types of limitations.

Giovannini & Park (1989) examined the effects of forbidding the households from trading assets internationally. The difference there was that regulations were imposed on the volume of financial transactions that happened with the subsidy of foreign trade, while until then the restrictions were on taxes on international interest payments, on stocks of foreign assets or on taxes on acquisitions of foreign kinds of payments. Their findings showed that the companies transfer the falsifications from financial markets to goods markets, and they are associated to the strength of capital controls. More specifically, when there are stricter controls on trade then the financial expansion has bigger impact on the interest rates of a country.

Blundell-Wignall & Roulet (2014) compare pre-crisis periods and crisis periods. More specifically, they show that controls on capital inflows, especially in debt liabilities, are very useful in good times when emerging markets are characterized by strong inflows and there is strong upward pressure towards the exchange rates. Contrariwise, within the period of the crisis less tight restrictions on inflows result in better growth. According to Blundell-Wignall & Roulet (2014), a significant part of the microeconomic literature illustrates that when emerging countries introduce capital controls, they benefit from the positive impact which is predicted by the economic theory. Nevertheless, the indications in the macroeconomic literature are vague. Blundell-Wignall & Roulet (2014) cite that countries that are in favor of capital controls are the ones that want to avoid exchange rate appreciation with the purpose to support trade. Their findings showed no support for capital controls and that the positive impact was in the period before the crisis, while in the crisis period the impact was negative. Furthermore, in the pre-crisis periods characterized by strong inflows and high risk for exchange rate appreciation, introducing regulations on inflows in order to halt this appreciation creates strong trade advantages.

In the greatest part of empirical research there is no distinction between regulations on inflows and regulations on outflows. Magud, Reinhart & Rogoff (2011) separate these two types of controls while they also state that literature so far faces four very serious problems that make it difficult to make comparisons between empirical and theoretical research: i) there is no united theoretical frame that contributes to the analysis of macroeconomic consequences of controls, ii) there is heterogeneity in countries with capital controls and in the time when they were introduced, iii) there can be many reasons for capital controls to be successful and iv) there is no common methodology in the empirical research and previous studies have been influenced by countries that used capital controls in the past. Their findings are based on the distinction mentioned before. More specifically, regulations on capital inflows render the monetary policy more independent, they change the composition of capital flows and they restrict the exchange rates pressures. On the other hand, regulations on capital outflows reduce the outflows and potentially provide space for autonomous monetary policy, as in the case of Malaysia. Apart from that, there is little evidence for effective regulations on outflows, according to Magud, Reinhart & Rogoff (2011).

Cardoso & Goldfajn (1997) refer among others to the duration of usage of capital controls. They support that the government reacts intensively to capital flows by increasing restrictions on inflows during “booms” and reducing them in periods of financial distress. They believe that capital controls are effective in the short-run (six months) in changing the levels and the composition of capital flows but they do not have constant long-term impact. Cardoso & Goldfajn (1997) also claim that the role of capital flows is controversial, since they simultaneously increase development and create macroeconomic instability. They also state that capital flows affect consumption, production and macroeconomic management, and especially capital inflows offer the benefit of smoothing the consumption, a procedure that takes place when there are cyclical distortions and where there is growth promoted by foreign savings. Their findings show that capital controls are effective in the short-run, without having long-run impact and that regulations decrease flows and alter their composition away from debt and equity in the short-run.

Ostry et al. (2010) reached to a key conclusion that if the economy is operating near potential, if the amount of reserves is adequate and if the exchange rate is not undervalued, then the use of capital controls is an important policy instrument to regulate inflows, along with the use of prudential and macroeconomic policies. Despite the fact that capital flows in emerging countries are common, as they contribute to lower-cost financing and make the market appear confident, the sudden surges can affect macroeconomic management and create financial risks. Ostry et al. (2010) also state that these large capital inflows drive to the exchange rate appreciation and sabotage the advantage of the tradable sector, and moreover they may lead to excess foreign borrowing and foreign currency exposure. As mentioned before for Magud, Reinhart & Rogoff (2011), likewise Ostry et al. (2010) refer that there is empirical evidence that shows the impact of capital controls on monetary policy autonomy and on the composition of inflows, by elongating their maturity. Ostry et al. (2010) conclude that for prudential and macroeconomic reasons, there are cases where capital controls are legal policy components, as a way to manage the capital inflow surges.

Tamirisa (1999) examines the exchange and capital controls and their impact on trade. Bilateral exports depend on the distance among the participating countries, on the size and wealth of a country, on the tariffs and on exchange and capital controls. A liberal capital account in a

country can promote trade significantly. Until then, there was not much empirical evidence on the effects of exchange and capital controls on trade. According to Tamirisa (1999) the greatest part of recent studies used the black market premium to calculate the magnitude of exchange and capital controls and showed that they tend to reduce trade, although the black market premium is a deficient measurement as it can be biased and cannot yield reliable results. The findings of Tamirisa (1999) show that exchange and capital controls are a significant impediment to trade and especially to exports into developing countries, but not into industrial ones. It varies according to the level of development of the country and on the type of imposed exchange and capital controls. Exchange controls, consisted of regulations on current payments and transfers, are a small barrier to trade while capital controls confine bilateral trade for the developing countries and not for the industrial. Tamirisa (1999) emphasizes that these findings reflect the difference in the range of liberalization across countries and the types of restrictions: exchange controls have been completely cancelled worldwide whereas capital controls keep prevailing in many developing economies and not in industrial ones.

Samitas & Polyzos (2016) focused on the appropriate time of implementation of capital controls. Their findings illustrate that when restrictions to capital flows are implemented early, there can be less impact from these controls to the banking system and to the economy as a whole. They underline the dire consequences of capital controls on the financial system and present how these negative effects are transmitted to the real economy via a reduction in corporate investment, creating a total production loss. Samitas & Polyzos (2016) stress that even if adopting such controls early reduces the negative effects, the government should reconsider about introducing capital controls when there is a banking crisis occurring. The authors also suggest that policy makers focus on designing other policy tools as a first solution and do not introduce capital controls unless it is the last option.

According to Ghosh, Qureshi & Sugawara (2014) the majority of previous studies has examined the policy options for managing capital flows on the recipient countries; however, there are some recent papers that conducted a more coordinated research in managing flows by acting “at both ends”, the source and the recipient countries. The idea of regulating short-term flows “at both ends” to reduce capital flow volatility has been introduced in the Bretton Woods system by its main founders, John Maynard Keynes and Harry Dexter White, in their attempt to regulate the

international monetary system after the World War II. The findings of Ghosh, Qureshi & Sugawara (2014) show that restrictions “at both ends” can affect the quantity of cross-border capital flows. Regarding the source country, controls on capital outflows are related to smaller flows whereas for the recipient country, controls on capital inflows are related to smaller inflows. The authors also conclude that while the impact of simultaneous restrictions on inflows or outflows may not be additive, actions “at both ends” can create a bigger decrease in the quantity of flows or an equal decrease, though with less strict controls, at either end.

To my knowledge, while there are several papers that focus on the effects of capital controls on real economy and GDP, only a few deal with their impact on consumption and imports. Therefore, my purpose is to further examine this impact in Greece, as it is a very recent case with global repercussion.

#### **4. Data and Sample**

This study consists of panel data in quarterly country-level macroeconomic variables from the first quarter of 2010 until the fourth quarter of 2016. I collected the data from the database of Eurostat, as it is an ideal source for macroeconomic data in aggregate level. The data is retrieved in chain linked volumes of 2010, which implies that it is in real prices without the effects of inflation or deflation, and it is seasonally and calendar adjusted. Subsequently, I converted these volumes to per capita amounts, in order to have a more representative comparison between the countries.

The year 2008, when the global financial crisis started, was deliberately excluded from the sample. Hence, the sample period starts in 2010 so that all the effects of the crisis would be attenuated. The capital controls were implemented in Greece in late June, 2015 so the treated unit is Greece and the intervention of interest takes place in the second quarter of 2015. The pre-intervention data consists of five and a half years and the post-intervention data consists of one and a half year. The sample period ends in 2016 when the most recent data was available for.

The macroeconomic variables I decided to include in this study, and to examine if there is an impact on them resulting from the implementation of capital controls in Greece, are per capita

final consumption expenditure of households and per capita imports of goods and services. Since capital controls in Greece restricted cash withdrawals and excluded cash circulation outside the country, a negative impact on individual consumption expenditure and on imports is expected as a result of this paper. Consumption is not that common in previous literature whereas imports, usually included in the term of trade along with exports, have been the subject of several papers concerning the effects of capital controls. It is necessary to mention here that one more variable is used as auxiliary, per capita exports of goods and services.

The countries I selected as the comparison group are, with alphabetical order, Austria, Belgium, Finland, Hungary, Ireland, Italy, Lithuania, Portugal and Spain. First of all, the control group needs to be unaffected by the event of interest. To my knowledge, none of the nine countries of the control group had imposed capital controls similar to Greece's for the period 2010-2016. However, there are different types of controls with different uses which make it difficult for a researcher to be confident for its selection. Second, the comparison group needs to have relevant characteristics with the treated unit. I selected Portugal, Italy, Ireland and Spain as, along with Greece (PIIGS), they were similarly affected by the global financial crisis. The rest of the countries may not be that similar to Greece, however the methodology applied in this paper ensures that the comparison group is as similar as possible. As Abadie, Diamond & Hainmueller (2010) state, it is not easy to find unaffected units with very similar characteristics to those of the unit affected by the intervention of interest.

## **5. Methodology and model**

### **Synthetic control method**

Researchers are often eager to examine the effects of several events or policy interventions that happen at an aggregate level and influence aggregate entities, such as firms, organizations, or geographic areas such as countries and cities (Abadie, Diamond & Hainmueller, 2010). In order to assess the impact of these events they use comparative case studies, where they “estimate the evolution of aggregate outcomes for a unit affected by a particular occurrence of the event or intervention of interest and compare it to the evolution of the same aggregates estimated for

some control group of unaffected units” (Abadie, Diamond & Hainmueller, 2010, p. 493). Here, the unit affected by the specific event of interest - the implementation of capital controls – is Greece, whereas the control group refers to the rest nine countries. The aggregate outcome variables of interest refer to per capita final consumption expenditure of households and per capita imports of goods and services, hereinafter cited often as consumption and imports, respectively.

The only requirement for the comparison of the evolution of an aggregate outcome between exposed and unexposed units to the intervention of interest is the aggregate data, which is often easily accessible (Abadie, Diamond & Hainmueller, 2010). Due to the fact that policy interventions and events of interest occur at an aggregate level and that there is available macro and aggregate data, research applying comparative case studies has a big potential. Nevertheless, according to Abadie, Diamond & Hainmueller (2010), comparative case study research encounters two issues that restrict its use in social sciences and influence its empirical application: i) in comparative case studies there is ambiguity in the way comparison groups are selected; they are chosen based on subjective reasons of researchers regarding the relationship between treated and untreated units, ii) comparative case studies contain an uncertainty concerning the aggregate values of the variables in the sample. However, this does not mean that the effect of the event of interest can be estimated without errors. Abadie, Diamond & Hainmueller (2010) emphasize that even with aggregate data, it is uncertain whether there is a potential of extracting accurate information from the control group about the counterfactual outcome orbit of the treated unit, assuming the intervention never occurred.

The main idea of synthetic control is that a combination of units usually creates a more representative comparison for the exposed unit than any single unit by itself. Compared to traditional regression methods, the synthetic control method has two advantages, the transparency and the safety against extrapolation (Abadie, Diamond & Hainmueller, 2010). Given that a synthetic control is the weighted average of the existing control units, the method clarifies how each control unit contributes to the counterfactual outcome of interest and the extent of similarity between the treated unit and the control group. These weights should be nonnegative and sum to one, providing safety against extrapolation (Abadie, Diamond & Hainmueller, 2010).



Robbins, Saunders & Kilmer (2015) stress the extensive use of synthetic control methods as tool for analysis of economic programs given that the analyst can obtain a complete perspective of the effect of the intervention by comparing the exposed units to their respective synthetic control. The main form of synthetic control methods includes a single treated unit with multiple untreated units for comparison; all the units have been measured across different time periods before and after the treatment (Robbins, Saunders & Kilmer, 2015). Sometimes, the scarcity of data can impede efforts to i) create a comparison group that matches the exposed unit, ii) estimate the effect of the intervention with precision, iii) calculate how statistically significant is the effect and iv) embody the multiple outcome variables of interest (Robbins, Saunders & Kilmer, 2015).

Synthetic control is based on the setting of a conventional difference-in-differences model but has two different properties: i) it allows for time-varying individual-specific heterogeneity and ii) it takes a data driven approach to select the control group and form the counterfactual (Sovich, 2016). A difference-in-differences model holds, if it is assumed that the treated and untreated units follow similar factor models before the intervention and furthermore, that they do not undergo differential shocks after the intervention, although a structural break occurring in both groups is allowed (Sovich, 2016). Synthetic control maintains these assumptions and forms a control group less subjectively, and also it has several advantages over a difference-in difference model: i) it creates graphs that depict how the Average Treatment on the Treated (ATT) varies over time and analyzes how much the controls resemble in the pre-intervention period, ii) it is efficient even when the exposed unit is only one and iii) it can calculate a separate ATT for every affected observation (Sovich, 2016). However, the synthetic control method has three disadvantages: i) its estimators cannot conduct large scale (asymptotic) inference; it uses permutation methods to calculate standard errors, instead, ii) there is no clear identifying assumption and iii) it needs more time than the difference-in difference model to perform calculations (Sovich, 2016).

Inspired by the publication Abadie, Diamond & Hainmueller (2010), I describe a conventional model of the synthetic control approach. This model is based on the difference-in-differences framework with linear panel data, which allows the variation over time of the effects of unobserved variables on the outcome. I use the synthetic control method twice to examine the

effects of the implementation of capital controls in Greece, in late June 2015, on both consumption and imports.

The following model is based on Abadie, Diamond & Hainmueller (2010) and considers a single treated unit with multiple controls. Suppose we observe  $J+1$  countries for  $t = 1, \dots, T$  periods and that, “without loss of generality”, the first country, Greece, is affected by the event of interest, whereas countries  $\{2, \dots, J+1\}$  are the potential controls. An intervention happens at period  $T_0 + 1$ ,  $1 < T_0 + 1 < T$ , which in this case is the implementation of capital controls, and it only affects country one (Greece) and leaves the remaining  $J$  countries unaffected. To make notation simpler and again, as stated in Abadie, Diamond & Hainmueller (2010), “without loss of generality” assume that the first country is treated without interruption after some initial treatment period. The purpose is to measure the effect of the intervention on the treated country, *id est* the effect of capital controls implementation on Greece.

Let  $Y_{it}^N \equiv$  outcome that would be observed for country  $i$  at time  $t$  in the absence of intervention, for countries  $i = 1, \dots, J + 1$  and time periods  $t = 1, \dots, T$ . Let  $T_0 \equiv$  number of periods before the intervention,  $1 \leq T_0 < T$ . Let  $Y_{it}^I \equiv$  outcome that would be observed for country  $i$  at time  $t$  if country  $i$  is exposed to the event in periods  $T_0 + 1$  to  $T$ . In accordance with Abadie, Diamond & Hainmueller (2010), we assume that the intervention has no impact on the outcome before the implementation period, therefore we have  $Y_{it}^I = Y_{it}^N$  for  $t < T_0 + 1$  and all  $i \in \{1, \dots, N\}$ . In the cases where interventions have an effect before their implementation, through anticipation effects, then we just redefine  $T_0$  to the first period in which the outcome may possibly react to the treatment. In the notation it is also implied the common assumption that units do not interfere with each other, meaning that we assume that the intervention only affects the treated unit while the outcomes of the untreated units remain unaffected.

Consecutively, as Abadie, Diamond & Hainmueller (2010) suggest, let  $\alpha_{it} = Y_{it}^I - Y_{it}^N$  be the effect of the treatment on unit  $i$  at time  $t$ , and let  $D_{it}$  be an indicator (dummy variable) with value one if unit  $i$  is treated at time  $t$  and zero otherwise. At time  $t$ , the observed outcome for unit  $i$  is

$$Y_{it} = Y_{it}^N + \alpha_{it}D_{it} .$$

Given that only country “one” is affected by the intervention and only after period  $T_0$ , with  $1 \leq T_0 < T$ , we have

$$D_{it} = \begin{cases} 1 & \text{if } i = 1 \text{ and } t > T_0, \\ 0 & \text{otherwise.} \end{cases}$$

We want to estimate the effect of intervention over time for the treated unit

$$\alpha_1 = (\alpha_{1T_0+1}, \dots, \alpha_{1T}),$$

where for  $t > T_0$ :

$$\alpha_{1t} = Y_{1t}^I - Y_{1t}^N = Y_{1t} - Y_{1t}^N.$$

Given that  $Y_{1t}^I$  is observed, we need to estimate  $Y_{1t}^N$  in order to estimate  $\alpha_{1t}$ . Therefore, we only need to construct the unobserved counterfactual. Assume that  $Y_{it}^N$  follows a factor model for all  $i$ :

$$Y_{it}^N = \delta_t + \theta_t Z_i + \lambda_t \mu_i + \varepsilon_{it}, \quad (1)$$

where  $\delta_t$  represents an unobserved common factor with constant factor loadings across units,  $Z_i$  is a  $(r \times 1)$  vector of observed covariates unaffected by the intervention,  $\theta_t$  is a  $(1 \times r)$  vector of loadings (unknown parameters),  $\lambda_t$  is a  $(1 \times F)$  vector of common unobserved factors,  $\mu_i$  is an  $(F \times 1)$  vector of unknown factor loadings, and  $\varepsilon_{it}$  are zero mean unobserved transitory shocks at the country level.

Always in accordance with Abadie, Diamond & Hainmueller (2010), consider a  $(J \times 1)$  vector of weights  $\mathbf{W} = (w_2, \dots, w_{J+1})'$  with  $w_j \geq 0$  for  $j = 2, \dots, J+1$  and  $w_2 + \dots + w_{J+1} = 1$ . The idea is that each value of the vector  $\mathbf{W}$  represents a potential synthetic control, which is a specific weighted average of control countries. For each synthetic control  $\mathbf{W}$ , the value of the outcome variable is

$$\sum_{j=2}^{J+1} w_j Y_{jt} = \delta_t + \theta_t \sum_{j=2}^{J+1} w_j Z_j + \lambda_t \sum_{j=2}^{J+1} w_j \mu_j + \sum_{j=2}^{J+1} w_j \varepsilon_{jt}.$$

Suppose that there are  $(w_2^*, \dots, w_{J+1}^*)$  such that the synthetic control matches the treated unit in the pre-intervention period

$$\begin{aligned} \sum_{j=2}^{J+1} w_j^* Y_{j1} &= Y_{11}, & \sum_{j=2}^{J+1} w_j^* Y_{j2} &= Y_{12}, \dots, \\ \sum_{j=2}^{J+1} w_j^* Y_{jT_0} &= Y_{1T_0}, & \text{and } \sum_{j=2}^{J+1} w_j^* Z_j &= Z_1. \end{aligned} \quad (2)$$

In Appendix B of Abadie, Diamond & Hainmueller (2010) it is proven that if  $\sum_{t=1}^{T_0} \lambda_t' \lambda_t$  is non-singular, then for all  $t > T_0$  we have

$$Y_{1t}^N - \sum_{j=2}^{J+1} w_j^* Y_{jt} = \sum_{j=2}^{J+1} w_j^* \sum_{s=1}^{T_0} \lambda_t \left( \sum_{n=1}^{T_0} \lambda_n' \lambda_n \right)^{-1} \lambda_s' (\varepsilon_{js} - \varepsilon_{1s}) - \sum_{j=2}^{J+1} w_j^* (\varepsilon_{jt} - \varepsilon_{1t}). \quad (3)$$

We have

$$\mathbb{E} \left[ \sum_{j=2}^{J+1} w_j^* \sum_{s=1}^{T_0} \lambda_t \left( \sum_{n=1}^{T_0} \lambda_n' \lambda_n \right)^{-1} \lambda_s' (\varepsilon_{js} - \varepsilon_{1s}) - \sum_{j=2}^{J+1} w_j^* (\varepsilon_{jt} - \varepsilon_{1t}) \right] \rightarrow 0$$

as  $T_0 \rightarrow \infty$  or if the number of pre-treatment periods  $T_0$  is large relative to the transitory shocks  $\varepsilon_{it}$ . Then we can use

$$\hat{\alpha}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt} = Y_{1t} - Y_{W^*t}$$

for  $T_0 + 1 < t < T$ , as an approximately unbiased estimator of  $\alpha_{1t}$ , which represents the difference between the observed outcome and the synthetic control.

Note that equation (2) can only hold if  $(Y_{11}, \dots, Y_{1T_0}, Z_1')$  belongs to the convex area of  $\{(Y_{21}, \dots, Y_{2T_0}, Z_2'), \dots, (Y_{J+1,1}, \dots, Y_{J+1T_0}, Z_{J+1}')\}$ . As a matter of fact, it is common that there is no such set of weights that can make equation (2) fit precisely the data. Subsequently, the synthetic

control is chosen so that equation (2) can fit approximately the data. Sometimes it is not feasible to get a weighted combination of unaffected units and thus, equation (3) may approximately hold. This can happen if  $(Y_{11}, \dots, Y_{1T_0}, Z'_1)$  does not belong in the convex area of  $\{(Y_{21}, \dots, Y_{2T_0}, Z'_2), \dots, (Y_{J+11}, \dots, Y_{J+1T_0}, Z'_{J+1})\}$ .

As suggested by Abadie, Diamond & Hainmueller (2010), even in the case where synthetic control matches sufficiently the exposed unit, there can be large interpolation biases if the aforementioned simple linear model does not hold for the entire set of countries in any possible sample. A solution in order to limit such biases due to comparison of countries with different characteristics is to include in the comparison group only countries with similar characteristics to those of the country affected by the event of interest. This justifies why I decided to include the PII(G)S countries in the comparison group.

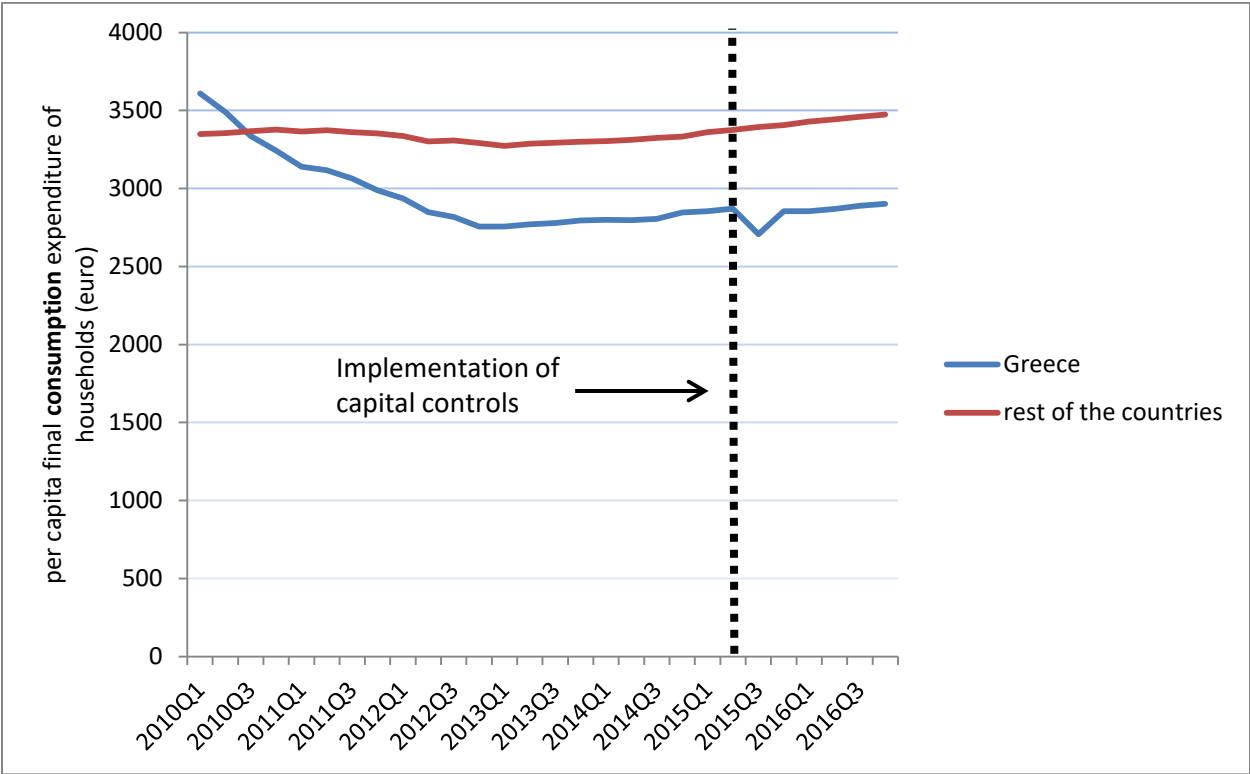
In order to proceed with the estimations, I used the software STATA to perform the synthetic control method twice. In the first application, the outcome variable of interest is per capita final consumption expenditure of households and the predictor is per capita imports of goods and services, whereas in the second application, the respective variables are per capita imports of goods and services and per capita exports of goods and services. Both applications construct a synthetic Greece that reflects the values of predictors before the implementation of capital controls in Greece. The effect of capital controls on consumption and imports is estimated as the difference between Greece and its synthetic versions on both macroeconomic variables, after the implementation of capital controls.

## **6. Results**

Graphs 1 and 2 depict the trends in Greece and the rest of the examined countries in per capita final consumption expenditure of households and per capita imports of goods and services, respectively. As it can be noticed in these graphs, the selected rest of the countries may not provide an appropriate comparison group for Greece in order to examine the effects of capital controls implementation on consumption and imports.

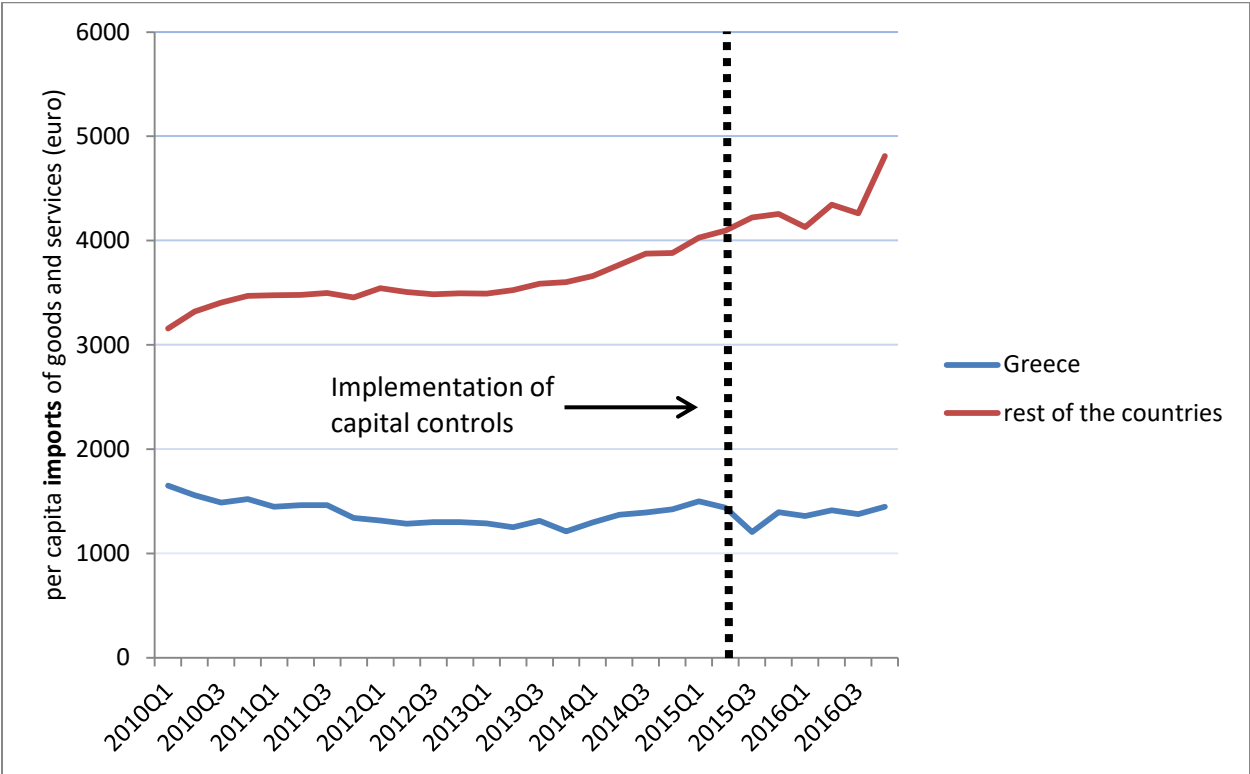
In graph 1 it can be seen that in the beginning of 2010, the level of consumption in Greece is higher than the respective figure of the rest of the countries until they converge and cross approximately in the middle of 2010. Subsequently, Greece follows a decreasing trend until the end of 2012 when it starts slightly to increase up to the middle of 2015 when the capital controls are implemented. The respective figure for the rest of the countries in the beginning of 2010 it slightly increases until it reaches the end of 2011 when it starts to fall until the beginning of 2013 when it starts a slight upward trend until the occurrence of the event of interest. Following the implementation of capital controls, the level of consumption for the rest of the countries continues to rise while the respective figure for Greece presents a remarkable drop for approximately three months and consecutively shows a significant increase for another 3 months until the beginning of 2016 when it follows a slightly upward trend.

Graph 1. Trends in per capita final consumption expenditure of households: Greece vs. the rest of the countries



In graph 2 it is obvious that the level of imports in Greece and the rest of the countries differ remarkably even before the implementation of capital controls. The level of imports of Greece fluctuates around 1500 euros per person for the period before the intervention whereas the respective figure for the rest of the countries starts slightly above 3000 euros per person in the beginning of 2010 and increases to approximately 4000 euros per person right before the event of interest. Following the implementation of capital controls, the level of imports for Greece shows a significant decline for the next 3 months, and then it recovers and slightly stabilizes, whereas the respective figure for the rest of the countries fluctuates followed by a notable upward trend.

Graph 2. Trends in per capita imports of goods and services: Greece vs. the rest of the countries



To assess the effect of the implementation of capital controls on consumption and imports in Greece, the main question is how the aforementioned macroeconomic variables would have evolved in Greece after June 2015 in the absence of capital controls. Thereinafter, the synthetic control method will estimate the necessary counterfactual to extract the results.

### *Synthetic Control Method – Outcome Variable: Consumption*

As mentioned earlier, the construction of synthetic Greece mirrors the convex combination of the rest of the countries that show the closest resemblance to Greece in terms of imports (Abadie, Diamond & Hainmueller, 2010). Table 1 compares the pre-intervention characteristics of actual and synthetic Greece, along with the average of the rest nine countries.

Table 1. Predictor Balance for consumption

Predictor	Greece		<i>Average of 9 control countries</i>
	<i>Treated</i>	<i>Synthetic</i>	
Imports of goods and services (per capita)	1390.935	1505.515	3558.155

We observe that the average of the nine countries does not seem to account for a suitable control group for Greece. More specifically, before the implementation of capital controls the average per capita imports is substantially higher in the average of the nine countries than in Greece. On the contrary, the synthetic Greece approximates the level of the predictor which Greece had before the implementation of capital controls.

According to Abadie, Diamond & Hainmueller (2010), the results on this table emphasize an important property of the estimators in synthetic control method. In particular, the synthetic control method reveals the relation between Greece and its synthetic counterpart, which consists of the weighted average of the rest nine countries. Thus, the synthetic control method prevents the estimation of counterfactuals that do not belong in the convex area, as mentioned in previous section.

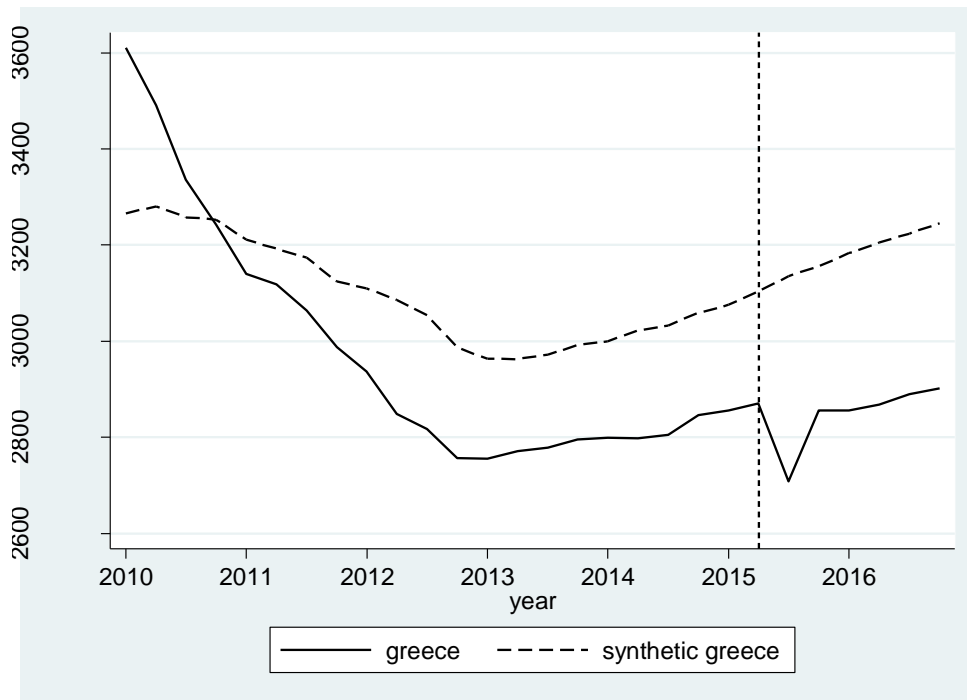
Table 2 shows the weights of the control countries that constitute the synthetic Greece. It can be observed that Spain is the country that can reproduce Greece better, as it is assigned weight one while the remaining countries are assigned zero weight.



Table 2. Country weights in the synthetic Greece

<i>Country</i>	<i>Weight</i>
Austria	0
Belgium	0
Finland	0
Hungary	0
Ireland	0
Italy	0
Lithuania	0
Portugal	0
Spain	1

Graph 3. Trends in per capita final consumption expenditure of households: Greece vs. synthetic Greece



Graph 3 shows per capita final consumption expenditure of households for Greece and its synthetic counterpart for the period 2010-2016. It can be noticed that, compared to the level of consumption in the rest of the countries, as illustrated in graph 1, the level of consumption in the synthetic Greece approximates more the trajectory of the respective figure in Greece for the pretreatment period.

The estimation of the effect of the implementation of capital controls on per capita final consumption expenditure of households is based on the difference between per capita imports of goods and services in Greece and in its synthetic version subsequent to the treatment. It can be noticed that for a short period after the event, the two lines follow a different trend. While consumption in the synthetic Greece continues its upward trend, the actual Greece experiences a sharp drop for a short period after the intervention and then it rapidly recovers and reaches a steady state with a slightly upward trend. As Abadie, Diamond & Hainmueller (2010) state, this discrepancy suggests that in the short-run, there is a negative impact of the implementation of capital controls on per capita final consumption expenditure of households, as expected. This can be attributed to the limitations in cash withdrawals due to which private savings cannot be used as one wishes. Apparently, citizens needed some time to get accustomed to the new conditions and, for the elderly, to learn how to use plastic money. As soon as they accomplished that and, along with the loosening of cash withdrawal limitations, consumption recovered and reached its pre-intervention levels. These findings are in accordance with those of Cardoso & Goldfajn (1997), who showed that capital flows affect consumption and that capital controls are effective in the short-run, without having long-run impact.

### ***Synthetic Control Method – Outcome Variable: Imports***

The purpose, again, is to construct a synthetic Greece that reflects the convex combination of the rest of the countries that approximates Greece the most, in terms of per capita exports of goods and services, as Abadie, Diamond & Hainmueller, (2010) state. Table 3 compares the characteristics of actual Greece with those of the synthetic Greece, as well as with the average of the rest countries, in the pretreatment period.

It can be noticed that the average of the nine control countries does not reflect an appropriate control group for Greece. Particularly, in the pretreatment period, the average per capita exports is notably higher for the average of nine countries than for Greece. Contrariwise, the synthetic Greece approaches the level of the predictor that Greece had in the period before capital controls.

Table 3. Predictor Balance for imports

Predictor	Greece		<i>Average of 9 control countries</i>
	<i>Treated</i>	<i>Synthetic</i>	
Exports of goods and services (per capita)	1177.568	1444.189	3829.002

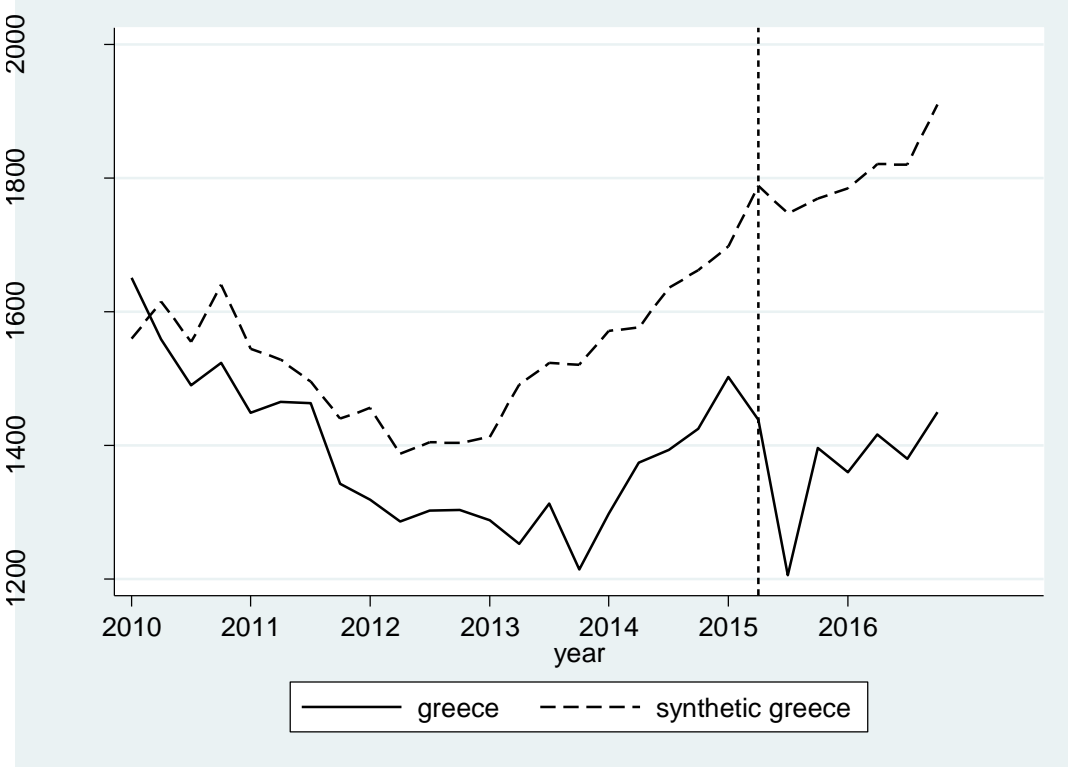
Table 4. Country weights in the synthetic Greece

<i>Country</i>	<i>Weight</i>
Austria	0
Belgium	0
Finland	0
Hungary	0
Ireland	0
Italy	0
Lithuania	0
Portugal	1
Spain	0

Table 4 shows the weights of the control countries that constitute the synthetic Greece. We can observe that the country that best reproduces Greece is Portugal, since it is assigned weight one whereas the other countries are assigned zero weight.

Graph 4 illustrates per capita imports of goods and services for Greece and its synthetic counterpart for the period 2010-2016. It is obvious that, in comparison with the level of imports in the rest of the countries, as shown in graph 2, the level of imports in the synthetic Greece resembles more the trajectory of the respective figure in Greece for the pre-intervention period.

Graph 4. Trends in per capita imports of goods and services: Greece vs. synthetic Greece



To estimate the effect of capital controls implementation on per capita imports of goods and services we need to know the difference between per capita exports of goods and services in Greece and in its synthetic version in the post-treatment period. It is obvious that for a short

period after the event, the two lines follow a different trend. Imports in the synthetic Greece experience a slight decline right after the event and consecutively follow an upward trend, whereas in the real Greece the respective figure plummets, followed by a recovery. However, the upward trend does not persist, even as imports in the synthetic Greece continue to increase. The difference suggests that in the short-run there is a negative effect of capital controls on per capita imports of goods and services, as expected. This can be attributed to the exclusive cash circulation inside the borders of Greece, as well as to cash withdrawal limitations. Exporting countries are not guaranteed their payments and therefore they do not ship their products. Additionally, individuals cannot have access to their full amount of savings; thus remittances are not considered a payment method anymore.

## **7. Conclusion**

Over the past, several financial crises have occurred due to unstable monetary systems or precedent political crises. Emerging economies, in their attempt to recover from the recession, attract foreign capital in surges. However, such volume of capital flows can cause undesirable results; therefore it is necessary to regulate them. Among macroeconomic policies and prudential measures, there is a policy tool imposed by many countries under such circumstances, the capital controls. The implementation of capital controls, along with the expected results, can have further impact.

Previous literature has studied the effects of capital controls on many fields. Extensive research has been conducted on their impact on the stock market, on exchange and interest rates, on trade, on monetary policy, on GDP *et cetera*. These studies yield ambiguous results since the effects of capital controls are controversial, and researchers resort to debates in order to solve their discrepancies. Whereas the majority of previous studies focuses on financial markets, this paper examines the effects of capital controls on aggregate economy and, particularly, on consumption and imports.

The method applied in the analysis is the synthetic control, which is built upon the standard difference-in-differences model, however with several alternative properties. Synthetic control

assumes an event of interest and the periods before and after that. It assumes a unit affected by the intervention of interest and others not affected. Synthetic control method matches the characteristics, in terms of predictors, of the unaffected units with those of the affected before the intervention and constructs a counterfactual that represents the trajectory of the treated unit in the absence of the event of interest. This paper uses Greece as the unit affected by the event of interest, capital controls, and nine more countries as the unaffected, also known as control group. The dataset consists of the quarterly-level macroeconomic variables, per capita final consumption expenditure of households, per capita imports of goods and services and per capita exports of goods and services, of the 10 countries for the period 2010-2016. Synthetic control is applied twice, with different outcome variables and predictors each time.

In the first application, the outcome variable of interest is consumption, while imports act as the predictor. Synthetic control matches the characteristics of the control group, in terms of imports, with those of Greece before the capital controls and constructs the synthetic Greece, which represents the trends of consumption in Greece if capital controls were not implemented. The findings show that while consumption in the synthetic Greece continues its upward trend, in real Greece the respective figure experiences a sharp decline for a short period after the intervention and then it recovers and reaches a steady state with a slightly upward trend. This short-term negative effect of capital controls on consumption can be attributed to limitations in cash withdrawals which deter citizens from using their cash or, generally, to the new conditions to which people need to adjust. Therefore, as soon as citizens adjust to changes, there is no long-term impact of capital controls on consumption, as the figure maintains its pre-intervention trend once it recovers.

In the second application of synthetic control method, the outcome variable of interest is imports, and exports act as the predictor. The characteristics of the control group are matched, this time in terms of exports, with those of Greece before the implementation of capital controls. Synthetic control constructs the synthetic Greece, which represents the trends of imports in Greece in the absence of capital controls. The findings show that imports in the synthetic Greece experience a slight fall right after the intervention and then follow an upward trend, while in the actual Greece the respective figure plummets and subsequently recovers. However, even in the synthetic Greece imports continue to increase, in the real Greece the upward trend does not continue.

There is a short-term negative impact of capital controls on imports that can be attributed to the restricted circulation of cash only inside the borders of Greece, as well as to cash withdrawal limitations. Moreover, there is no obvious long-term effect of capital controls on imports, as they recover from the sharp decline. Their trend in the years before the intervention is not stable as they experience many fluctuations. After the recovery, the figure continues to variate.

It is worth mentioning that the decrease of consumption can cause a surplus in some products, which can automatically lead to a drop in imports of such products. On the other hand, limited imports can decrease the consumption, since there will be no sufficient products in the markets. Therefore, the impact of capital controls can be amplified as in real economy the macroeconomic variables are interdependent. In the early days of implementation, citizens were against capital controls as these measures coerced them to change their consuming habits. However, this impact is not permanent as, according to the findings, the macroeconomic variables manage to recover. As a matter of fact, no one can be sure that there will not be any further impact in the future. Since capital controls are still in use, though less strict, they keep affecting the real economy of Greece.

As an extension of this study, more predictors can be used and, in fact, complementary to the outcome variables of interest, as suggested by Abadie, Diamond & Hainmueller (2010). Therefore, this can be the base for further examination.

## **References**

- Abadie, A., Diamond, A. & Hainmueller, J. (2010). Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program, *Journal of the American Statistical Association*, [e-journal] vol. 105, no. 490, pp.493–505, Available Online: <http://www.tandfonline.com/doi/abs/10.1198/jasa.2009.ap08746>.
- Andreasen, E., Schindler, M. & Valenzuela, P. (2017). Capital Controls and the Cost of Debt, Working Paper of the International Monetary Fund, no. 135.
- Blundell-Wignall, A. & Roulet, C. (2014). Capital Controls on Inflows , the Global Financial Crisis and Economic Growth: Evidence for Emerging Economies, *OECD Journal: Financial Market Trends*, vol. 2013/2, pp.29–43.
- Buss, A. (2013). Capital Controls And International Financial Stability A Dynamic General Equilibrium Analysis In Incomplete Markets, Working paper of the European Central Bank no. 1578.
- Cardoso, E. & Goldfajn, I. (1997). Capital Flows to Brazil: The Endogeneity of Capital Controls, Working Paper of the International Monetary Fund, no. 115.
- Ghosh, A. R., Qureshi, M. S. & Sugawara, N. (2014). Regulating Capital Flows at Both Ends : Does It Work ?, Working Paper of the International Monetary Fund, no. 188.
- Giovannini, A. & Park, J. W. (1989). Capital Controls and International Trade Finance, National Bureau of Economic Research, no. 3112.
- Magud, N. E., Reinhart, C. M. & Rogoff, K. S. (2011). Capital Controls: Myth and Reality - A Portfolio Balance Approach, National Bureau of Economic Research, no. 16805.
- Ostry, J. D., Ghosh, A. R., Habermeier, K., Chamon, M., Qureshi, M. S. & Reinhart, D. B. S. (2010). Capital Inflows : The Role of Controls, International Monetary Fund, no. 4.
- Robbins, M., Saunders, J. & Kilmer, B. (2015). A Framework for Synthetic Control Methods with High-Dimensional , Micro-Level Data: Evaluating a Neighborhood-Specific Crime Intervention, RAND Working Paper.



Samitas, A. & Polyzos, S. (2016). Freeing Greece from Capital Controls : Were the Restrictions Enforced in Time ?, *Research in International Business and Finance*, [e-journal] vol. 37, no. December 2015, pp.196–213, Available Online: <http://dx.doi.org/10.1016/j.ribaf.2015.11.005>.

Sovich, D 2016, Synthetic Control Methods, PowerPoint presentation, Empirical Methods, Washington University in St. Louis. Available from: [http://students.olin.wustl.edu/~sovichd/ecf\\_course\\_notes.html](http://students.olin.wustl.edu/~sovichd/ecf_course_notes.html). [6 June 2017].

Tamirisa, N. (1999). Exchange and Capital Controls as Barriers to Trade, *IMF Staff Papers*, vol. 46, no. 1, pp.69–88.

[www.investopedia.com](http://www.investopedia.com). 2017. Capital Control. [ONLINE] Available at: [http://www.investopedia.com/terms/c/capital\\_control.asp](http://www.investopedia.com/terms/c/capital_control.asp). [Accessed 10 July 2017].