The Arab G.D.P. per Capita under the Synthetic Control Method

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MOHAMED, Ahmed

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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ABSTRACT

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This paper will revolve around testing how would the Arab region be in terms of G.D.P. per capita if the Greater Arab Free Trade Area would have never gone into force in 2005, which the country members adopted in its General Provisions and negotiation rounds.

A comparison between synthetic and actual status of G.D.P. per capita levels will be then analyzed to test if the synthetic obtained data would have been more beneficial (G.D.P. per capita) for all country members.

The synthetic model is developed with control data based on North America, the European Union (E.U.), South Asia and East Asia as the biggest blocs and trade partners of the Arab region to generate G.D.P. per capita synthetic data of the Arab region, compared later with the actual data. The focus of the study will be from 1985 till 2019.

Therefore, the main findings show the G.D.P. per capita after 2005 of the Arab region is much higher on real data than on the synthetic data that accords to the agreement's scenario, never going into force. The difference between synthetic and actual data reaches a peak of 100% in 2008.

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1. Introduction

Multiple attempts of regional economic integration are seen nowadays in different geographical regions of the World. The European Union (E.U.) is far enough the most serious and most brilliant attempt worldwide with a full deep integration after World War II. The E.U. reached 2000 one economic zone with the euro currency. As it undertook many successful stages, many countries have made other attempts as the benefits of economic and trade integrations are numerous. The Arab region has also witnessed attempts to integrate its economies, which resulted in the GAFTA (Greater Arab Free Trade Area) in the Arab region. The Arab region refers in general as a region with sizeable political turbulence and instability.

In a nutshell, it is strongly arguable that the Arab region might be the best place to establish a full regional economic integration, as a common language and culture characterize the area. The past mentioned can ease by far the process of deep economic regionalism. The question persisting is interrogating if the attempt of Economic Integration in the Arab region had a beneficial effect on its citizen's living standards, even if limited.

Historically, the most important economic integration attempt between Arab countries was the 1981 agreement for facilitation and development of trade—the executive program of the contract mentioned above induced fourteen Arab countries to sign the GAFTA in 1997. The agreement's goal is the full removal of non-tariff and tariff obstacles on intra member countries trade in manufactured products. Concerning agricultural products, each country can exclude a maximum of 10 agricultural products during harvest seasons. The rules of origin are at 40% of the value-added. The rest of the articles align with the World Trade Organization (W.T.O.) rules with special provisions for the least developed countries in the region. To be noted, tariffs were fully exempted on the 1st of January 2005.

Nowadays, even with the full removal tariffs between trading countries in the agreement, there are several challenges for the proper use of the contract. Several country members impose a suspension of tariff exemption, establish non-tariff barriers and create negative lists.

Ultimately, governments of country members seek the Arab economic integration for economic growth, job creation, and poverty reduction. This thesis raises the question of whether the GAFTA agreement was beneficial to its country members, possibly in positive ways in terms of G.D.P. per capita, compared to a situation where GAFTA was never implemented.

The current paper tries to find new insights into the GAFTA agreement's effect on the Gross Domestic Product per capita of the Arab region countries. The aim is providing quantitative data on the impact of the agreement.

In the next section, the context of the paper's topic will be showcased through the definition of regionalism and R.T.A.s. A focus of GAFTA history, its main provisions and persistence of non-tariff obstacles will also be tackled.

2. Context

a- Regionalism & the Purpose of R.T.A.s

Regional economic integration happens when several countries with geographical proximity come together to establish an F.T.A., a customs union, a common monetary policy zone, or a full economic integrated zone where the financial policy is nearly standard. Mainly, country members' effects include trade diversion and trade creation and a better competitive level.

Regional Trade Agreements or, in short (R.T.A.s) is a type of economic treaties where two or more states agree on enhancing free trade of goods, plus services in some cases through their borders. A signed document with the rules accompanies the treaty to follow between the member states.

Regional trading agreements vary on the level of arrangement among the member countries, as follows:

- Preferential Trade Areas or P.T.A.s is the least developed form of R.T.A.s; signatory countries reduce trade barriers but do not thoroughly remove them, the reduction can be made by one party of the signed agreement, example: General Preference System of U.S.A.
- Free Trade Area all trade barriers among members are eliminated, meaning the free movement of goods and services among the signing parties. Many F.T.A.s are established in the World for the sake of explanation; GAFTA is an example.
- Customs Union mainly removes trade barriers among members and the adoption of common external trade restrictions. The COMESA in the African continent is a good example.
- Economic Union is one market with one currency; perhaps the most striking example is the European Union.
- Full integration is the final level of trading agreements, where the budgetary and financial policies are unified between member countries.

b- <u>GAFTA</u>

i. History of GAFTA

The GAFTA is a pan-Arab free trade zone signed in 1997 and founded by fourteen countries as follows: Sudan, Saudi Arabia, Syria, Tunisia, the United Arab Emirates, Lebanon, Libya, Bahrain, Egypt, Iraq, Kuwait, Oman, Morocco, and Qatar. As explained in the introduction, the establishment of GAFTA came up after the 1981 agreement on facilitating and developing Trade among Arab countries. The agreement was formed by the Arab League's Economic and Social Council (E.C.S.) in Amman, Jordan. Algeria later joined the GAFTA in 2009 as the eighteen-country member and the last since then. To be noted, eighteen Arab League member countries declared the formation of GAFTA through the E.C.S.

The participating member countries in GAFTA contribute to 95% of the Arab G.D.P. out of the 22 Arab League members by numbers.

ii. GAFTA agreement specific features

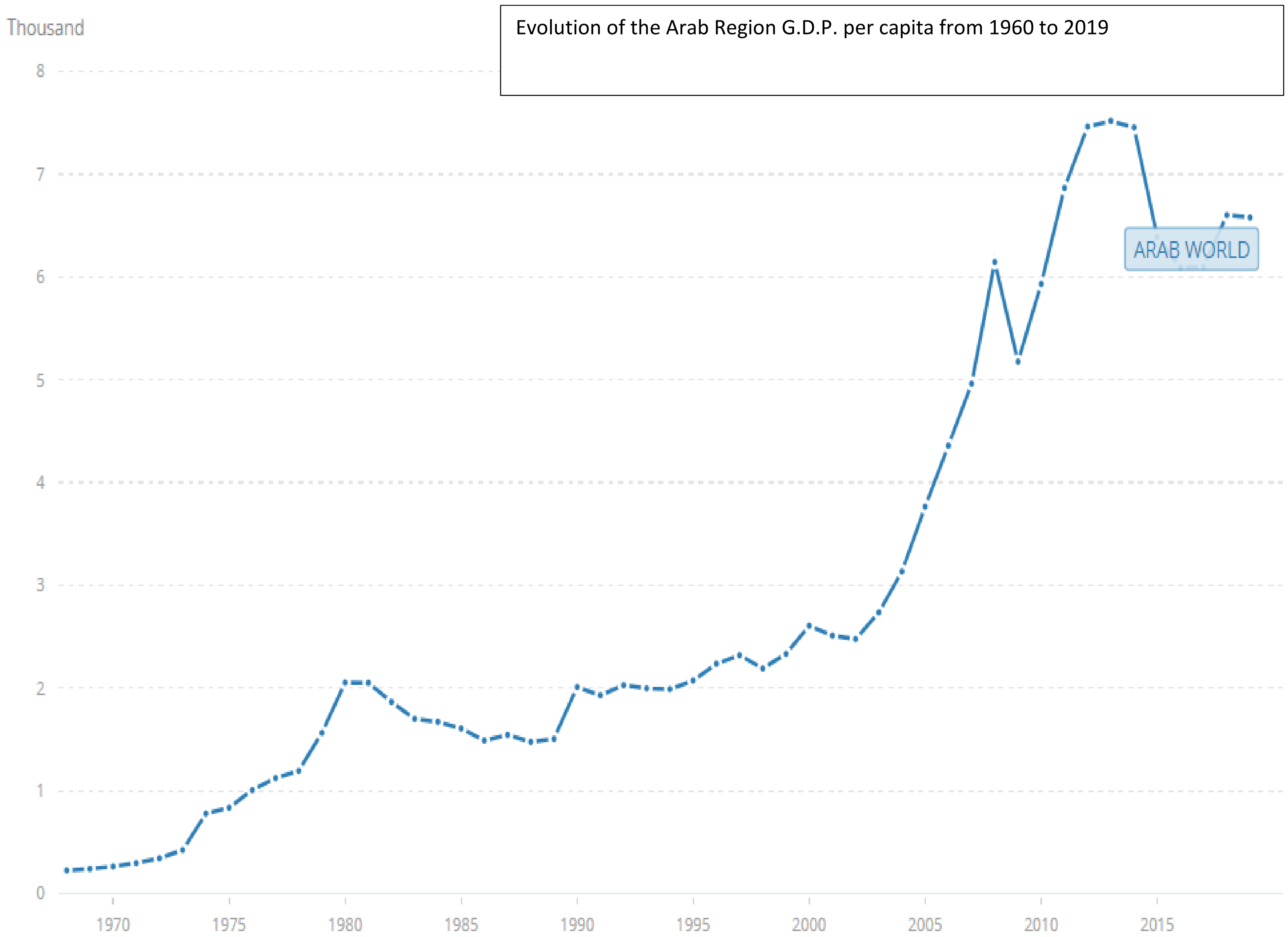
The Security Council of the Arab League coordinates between the country members to report their custom tariff programs. The country members also shared their specifications and standards so the traded goods can be guaranteed a smooth movement between the members. The Arab League also created the establishment of restrictions and specifications and the sharing of the agricultural sector through the application of the Arab Agriculture Pact.

The main GAFTA provisions are as follows:

- Reduction tariff-rates reached zero levels by 2005.
- Removing non-trade barriers (quotas, administrative, and monetary)

iii. Current Situation of GAFTA

According to the World Bank Group data website, the G.D.P. per capita in the Arab region showcased a steady growth since 1965. The steady increase is not as expected for an area rich in natural resources, specifically in oil. The help gives a strong edge to all countries in the region. However, the G.D.P. per capita in the area and economic integration do not reach the expected results. Except for Qatar, Kuwait and the United Arab Emirates, the rest of the countries of the Arab region still have an average G.D.P. per capita. The past-mentioned is seen in the following graph, retrieved by the World Bank data website.


Evolution of the Arab Region G.D.P. per capita from 1960 to 2019
Thousand
8
7
6
5
4
3
2
1
0
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
ARAB WORLD

In terms of G.D.P. and amongst GAFTA members, Saudi Arabia comes as the most robust economy, second by the United Arab Emirates and finally Egypt. The three countries have an aggregate of 54% of the G.D.P. of GAFTA, with Saudi Arabia alone occupying 29%, the United Arab Emirates 15% and Egypt around 10% (all information are 2018 related).

Another important indicator is the Global Competitiveness Index (GCI) provided by the World Economic Forum. The hand accounts for the productivity level of a given country technical conditions and public institutions level. The 2019 GCI ranks 141 countries across the World and provides each country accordingly, with 100 (100 being the highest score). Countries like Sudan, Libya, Syria, Palestine, and Iraq are not covered in the GCI report. The Global Competitiveness Index (GCI) index showcases the developments and the potentials that GAFTA countries hold, which could be achieved if the proper local and regional mechanisms are activated to achieve the desired sustainable regional economic growth. In 2019, the best three countries in terms of the indicated index above were U.A.E., Qatar, and Saudi Arabia, with respective 25^{th}, 29^{th}, and 36^{th}.

Intra trade within GAFTA shows very timid improvements during the past period. Indeed, when comparing 2018 to 2017, exports rose by 1.6%, and imports fell by 2.4%. In 2018, exports among member countries had 105 billion U.S. Dollars, and imports accounted for 107 billion U.S. Dollars. It was deduced that the intra trade levels between GAFTA members are slowly progressing due to numerous reasons such as the slowing down economic growth witnessed in the region, which limits the competitiveness of the country members in the trade realm.

According to the Arab Monetary Fund, most of the intra-trade between Arab countries mainly focuses on nearby countries. For instance, in 2018:

- 68% of the U.A.E.'s exports in the Arab region were to K.S.A. and Oman.

- 78.3% of Bahrain's exports in the Arab region were to U.A.E., K.S.A. and Oman.

- 77.1% of Tunisia's exports in the Arab region were to Libya, Algeria, and Morocco.

- 96.3% of Algeria's exports in the Arab region were directed to Tunisia, Egypt, and Morocco.

- 92.2% of Sudan's exports in the Arab region were referred to U.A.E., K.S.A. and Egypt.

The primary essential commodities which are being traded (in terms of both exports and imports) among GAFTA members are the following:

- Metals and its products.
- Plastics, rubbers, and its products.
- Electronic devices and machines.
- Chemical industry's products.
- Paper and its products.
- Food products.

According to the Arab Monetary Fund, metals and their products accounted as the major products interchanged among GAFTA members valued at around 24% of the region's trade operations from 2015 to 2018.

On the other hand, country members of GAFTA focus their trade volume outside the geographical agreement scope, focusing on the Asian region. Asia is now the main trade partner in term of exports, and in term of imports, the European Union is the main trade partner of Arab countries that signed the GAFTA agreement.

iv. Non-tariff barriers and GAFTA

Historically, nations have moved from tariff barriers to non-tariff barriers as an alternative way of national income. They were looking for funding for primary needs as healthcare, infrastructure, security and education. Developing countries usually use non-tariff barriers to protect their local industries as a fear of competition from imported products. On the other side, developed nations rely on non-tariff barriers as a regulatory trade regime by implementing strict and complicated quality standard rules, which by default also protects their local industries.

As a proper definition, non-tariff barriers are very similar in the outcome as tariff barriers. They induce a higher price of the traded goods and distort the aggregate welfare.

Worldwide, tariffs on manufactured goods have been highly reduced following the eight negotiation rounds in the World Trade Organization and the General Agreement on Tariffs and Trade – GATT. Protectionism theories and other reasons such as corruption and influence groups find their way through non-tariff barriers, for example, technical barriers to trade (TBT). According to the United Nations Conference on Trade and Development – UNCTAD, 2005 – the use of non-tariff barriers based on the quantities (quotas) and control price has decreased drastically, accompanied by a big jump of other forms of non-tariff barriers.

A simple way to explain non-tariff barriers is simply by stating that it's a new way of protectionism that nations use to find funding sources, protect local industries and a replacement of the old system of tariff barriers as a mercantilist approach to economic policies inducing a loss of international welfare and economic growth.

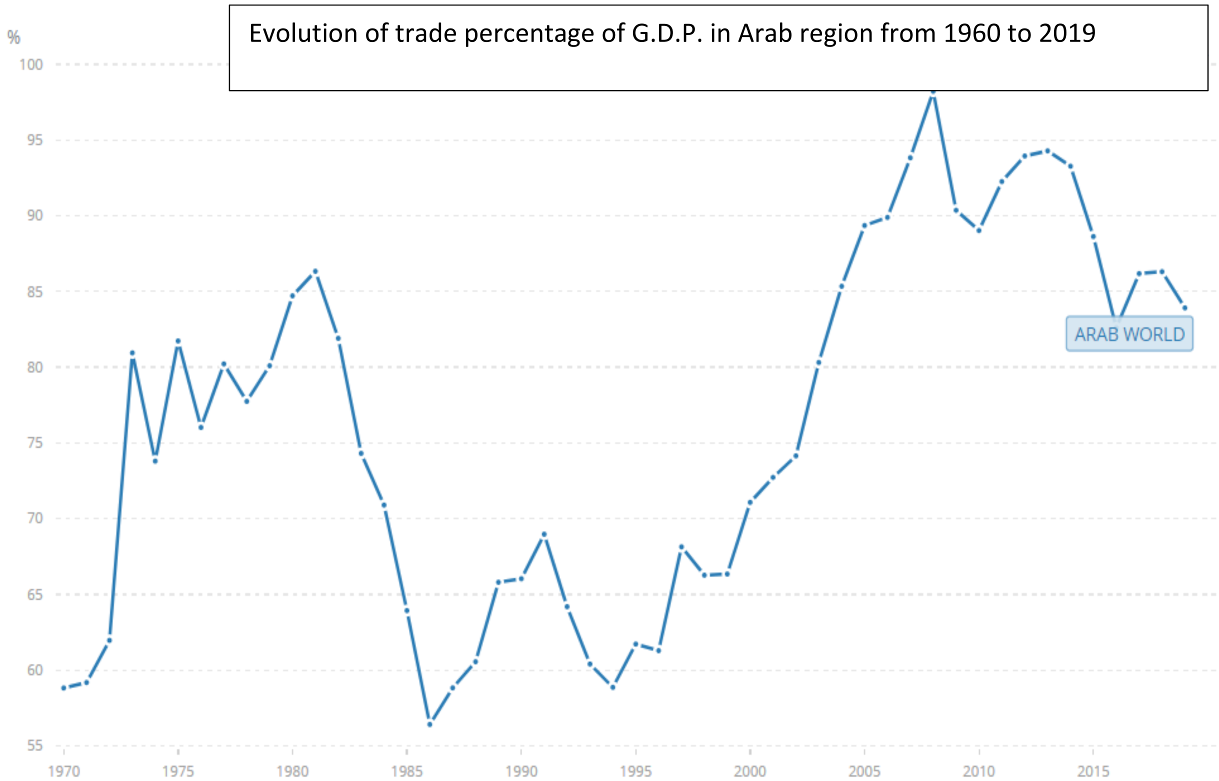
Non-tariff barriers can be divided into several categories. They can be grouped between internal taxes, health and sanitary regulations, government procurement policies or administrative barriers. Another way to group non-tariff barriers is to follow specific trade limitations, customs entry procedures, standards charges on import or others.

Despite huge progress on the multilateral trade level of regulations and regional integration efforts, international trade is slowed by non-tariff barriers.

In a nutshell, trade reform in the Arab region, which still focuses mainly on tariff reduction, are thought to have growth benefits.

But suppose governments reduce or abolish the widespread non-tariff measures (N.T.M.s), particularly through the elimination of quantitative trade restrictions. In that case, trade policy can become the central instrument for redressing the growth prospects of Arab countries.

Evolution of trade percentage of G.D.P. in Arab region from 1960 to 2019



A close look at the G.D.P. of the Arab region's trade percentage is showcased in this section. Looking at the last graph, an observation can be made the percentage of the trade in the Growth

Domestic Product of the Arab region is continuously rising since 1997, which is the year of the entry in force of the GAFTA agreement till 2005 with a percentage reaching in 2008 100%. The study showcases the period from 1985 till 2019. The flow of the percentage of trade and the G.D.P. per capita is almost the same in the period taken into consideration. Trade percentage is on an incline a couple of years before the G.D.P. per capita graph is presented at the beginning of the study. As explained before, the agreement came into force in 1997 until being fully into force in 2005. This can explain the lag between trade percentage and the G.D.P. per capita. So, it can be initially deduced that the agreement has a positive effect on the G.D.P. per capita of the Arab World.

3. Literature Review

To calculate the principal pf regionalism's effect if it has boosted intra trade within the same economic bloc. A modified gravity model estimates the past mentioned in the case of Latin America. MERCOSUR is estimated to have a poor effect on exports, accompanied by an increase in imports.

Soloaga and Winters applied the past mentioned model in information gathered for over 50 countries in the span of 1980-1996 to evaluate the effect of preferential trade agreements for non-oil exporting countries. With a modification on the gravity model equation for the sole purpose of separating exports, imports, and intra-trade. Their research results show the poor difference in intra trade creation but some diversion of trade, especially in the latter in the European Union case. Although MERCOSUR members have undoubtedly liberalized since the mid-1980s, these results suggest that their trade performance has been influenced more by competitiveness than trade policy.

However, according to the World Bank Group (W.G.B.), regional deep integration aids countries in F.T.A.s and R.T.A.s in breaking the trade barriers between countries through the flow of goods, services, capital and citizens. Indeed, the idea of trade protectionism stops economic growth and increases trade and investment flow. Protectionism is mainly witnessed in developing countries.

Regional integration is an efficient and easy way to obtain high economic gains that improve market efficiency, share costs of public goods and mega infrastructure, ease international integration, and help the assurance of peace in the region, according to research from Hadjiyiannis et al. (2016, p. 144).

In general, assessing the economic impact of regional integration is difficult. To be noted, regional integration has winners and losers, even within country members.

At this point, a literature review on the deep regionalism was conducted, now an assessment of GAFTA literature will be presented.

Most of the literature related to the economic outcome of GAFTA are descriptive. A couple of ex-ante studies are focused on several countries being analytical. One paper assessed the post-impact of GAFTA on the trade of member-countries (Javid, 2008).

Peridy provides insights proposing the welfare impact of the GAFTA through the increase in intra-trade, but there is the persistence of N.T.B.s. Abedini estimates the post GAFTA trade effect; he finds through a new theoretical development of the gravity equation that regional trade rose by 20% since GAFTA has been implemented. Harb explains the net trade creation of GAFTA and the existence of trade diversion. Furthermore, Zarrouk summarizes the results of a firm-level survey in nine countries regarding the implementation of the GAFTA. Many respondent companies reported that tariffs on intra-regional trade have largely been removed and that there has been a marked improvement in customs clearance-related procedures.

In the next section, the research design and methodology will be showcased.

4. Research Design and Methodology

In the American Journal of Political Science, Abadie explains the Synthetic Model Regression as follows: "One distinctive feature of comparative political science is that the units of analysis are often aggregate entities, such as countries or regions, for which suitable single comparisons often do not exist. The synthetic control method is based on the premise that when the units of analysis are a few aggregate entities, a combination of comparison units (which we term "synthetic control") often does a better job of reproducing the characteristics of the unit or units representing the case of interest than any single comparison unit alone. Motivated by this consideration, the comparison unit in the synthetic control method is selected as the weighted average of all potential comparison units that best resembles the characteristics of the case of interest."

In this paper, the chosen methodology started was composed of:

1. Figures and data released by credible organizations such as the Arab Monetary Fund and the World Bank Group (W.B.G.). Indeed, data collected by the W.B.G. was used. The W.B.G. provides data for a set of indicators from 1985 till 2019 for each region. The missing numbers are recovered through linear interpolation.
2. Research of papers conducted by other researchers made on GAFTA;

Furthermore, the construction of the synthetic model was made; accordingly, a sum of squares of the model was minimized where:

- the input is a vector of size; the number of control units and the number of data points is equal to the number of indicators. One indicator value for a country is found by doing the mean overall its importance from the starting year till 2019.

- the output is a scalar, with the number of data points equal to the number of indicators.

The found weights are then used to predict the G.D.P. per capita of the studied unit, given the input, a linear combination between the found weights and the control unit G.D.P. values.

Thus, one input data point is a vector of size the number of control units, with the number of data points equal to the number of studied years. Our control units are E.U., N.A.C., S.A. and E.A. and the studied unit is the Arab World.

A set of available data characteristics were used for the study over the period 1985 - 2019 as follows:

- "Inflation, consumer prices (annual %)",
- "Foreign direct investment, net inflows (current US$)",
- "School enrollment, primary (% gross)",
- "Net ODA received per capita (current US$)",
- "Population, total",
- "GDP growth (annual %)",
- "Foreign direct investment, net outflows (current US$)",
- "Oil rents (% of G.D.P.)",

- "Military expenditure (current USD)",
- "Trade (% of G.D.P.)",
- "Total reserves in months of imports".

The characteristics mentioned above are used to create the synthetic data model of the Arab region G.D.P. per capita in current USD.

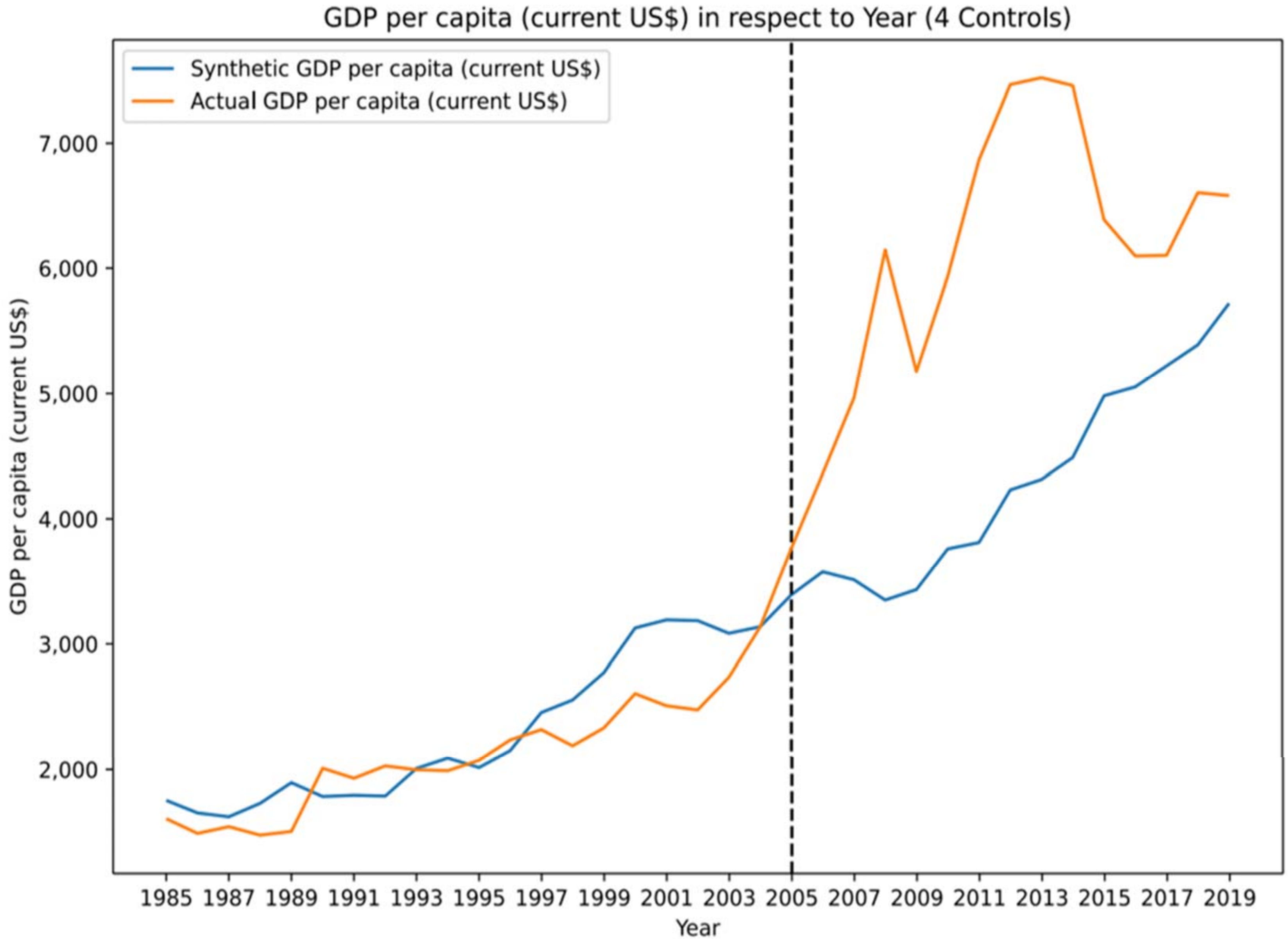
As previously presented, the methodology and research design try to capture the synthetic data of the Arab region with data of different blocs around the World. The extracted data to create the artificial Arab region are undoubtedly different from the actual data of the Arab region. In short, the resemblance in the data is low. To fix the problem, the extracted data are considered through multiple factors. The Arab region is heterogeneous in G.D.P. per capita, capturing various types of countries in terms of G.D.P. and income inequalities. The used model in this research only considers economic factors without charging social or political differences and inequalities. However, it is essential to note that this study used several financial blocks with similar characteristics in the political and economic inequalities as the GAFTA region.

In this paper, the treatment year is 2005. The treatment year represents the point where the synthetic data generated before 2005 started to auto-generate data after this treatment year. Basically, the treatment year represents the point where the assessment of the synthetic model is carried.

The region's stability is captured through military expenditure, and the oil effect is captured through oil rents.

5. Results

Year	Synthetic G.D.P. per capita (current US$)	Actual G.D.P. per capita (current US$)	Difference (current US$)
1985	1752.94	1606.75	-146.18
1990	1783.61	2009.42	225.80
1995	2015.02	2073.14	58.11
2000	3127.03	2606.07	-520.95
2005	3392.37	3765.82	373.44
2010	3759.85	5934.29	2174.43
2015	4981.28	6387.66	1406.37


GDP per capita (current US$) in respect to Year (4 Controls)
Synthetic GDP per capita (current US$)
Actual GDP per capita (current US$)
7,000
6,000
5,000
4,000
3,000
2,000
GDP per capita (current US$)
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Year

The obtained results are apparent in comparing the synthetic data of the G.D.P. per capita of the Arab region with the actual Data that there are two trends observed. The first trend is from 1985 until 2005, where both data were all similar. However, starting in 2005, a remarkable difference between the synthetic and actual data is observed. Indeed, in general, actual G.D.P. per capita is always higher than the synthetic G.D.P. per capita. Therefore, and as per the observation of the data after 2005, it can be deduced that the implementation of the GAFTA agreement and the liberalization of trade between country members enhanced the G.D.P. per capita hence helping in increasing the economic conditions in the region.

Starting in 2011, the actual G.D.P. per capita data began to decrease, which could be explained by the political and economic turbulence in the Arab Spring period. The decrease continued until 2015 and then started to increase afterwards slowly.

Besides, as explained in the general provisions of the GAFTA agreement, the region followed a scheme of 10% reduction since early 1998 until reaching the desired 100% reduction in 2005. Accordingly, in the above graph, it is observed that the real G.D.P. per capita increased significantly starting from 2003 until 2005, which the full implementation of tariff reduction could explain. Whilst comparing the synthetic and actual data between 2003 and 2005, it can be further observed that the actual data is increasing at a higher pace (as mentioned before) compared to the synthetic one. Therefore, this allows us to deduce that the Greater Arab Free Trade Area agreement had a positive impact through the full implementation of the tariff reduction.

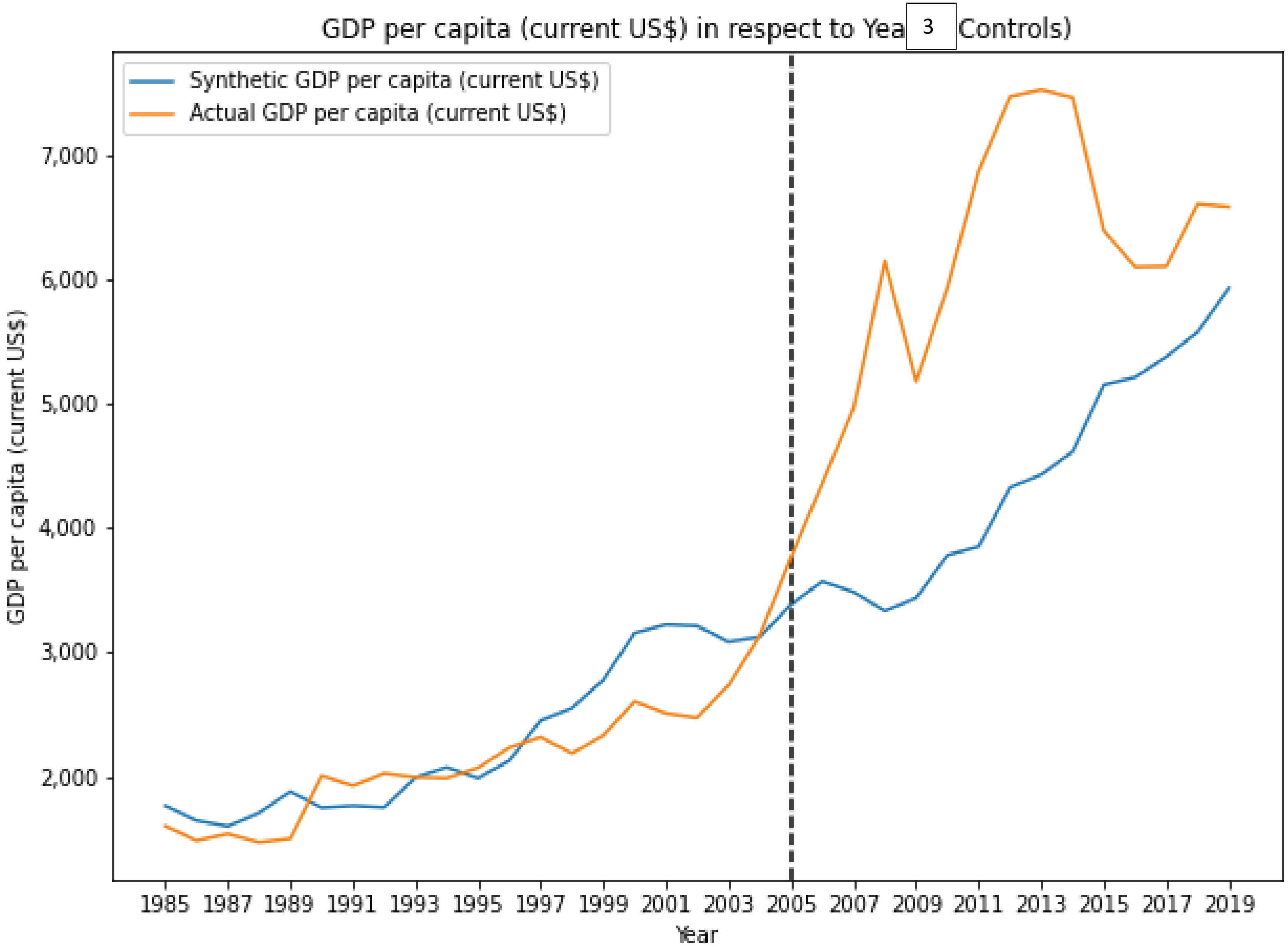
Furthermore, the synthetic data weights on the actual data are presented below to capture the relative difference. The outcome is in the following table.

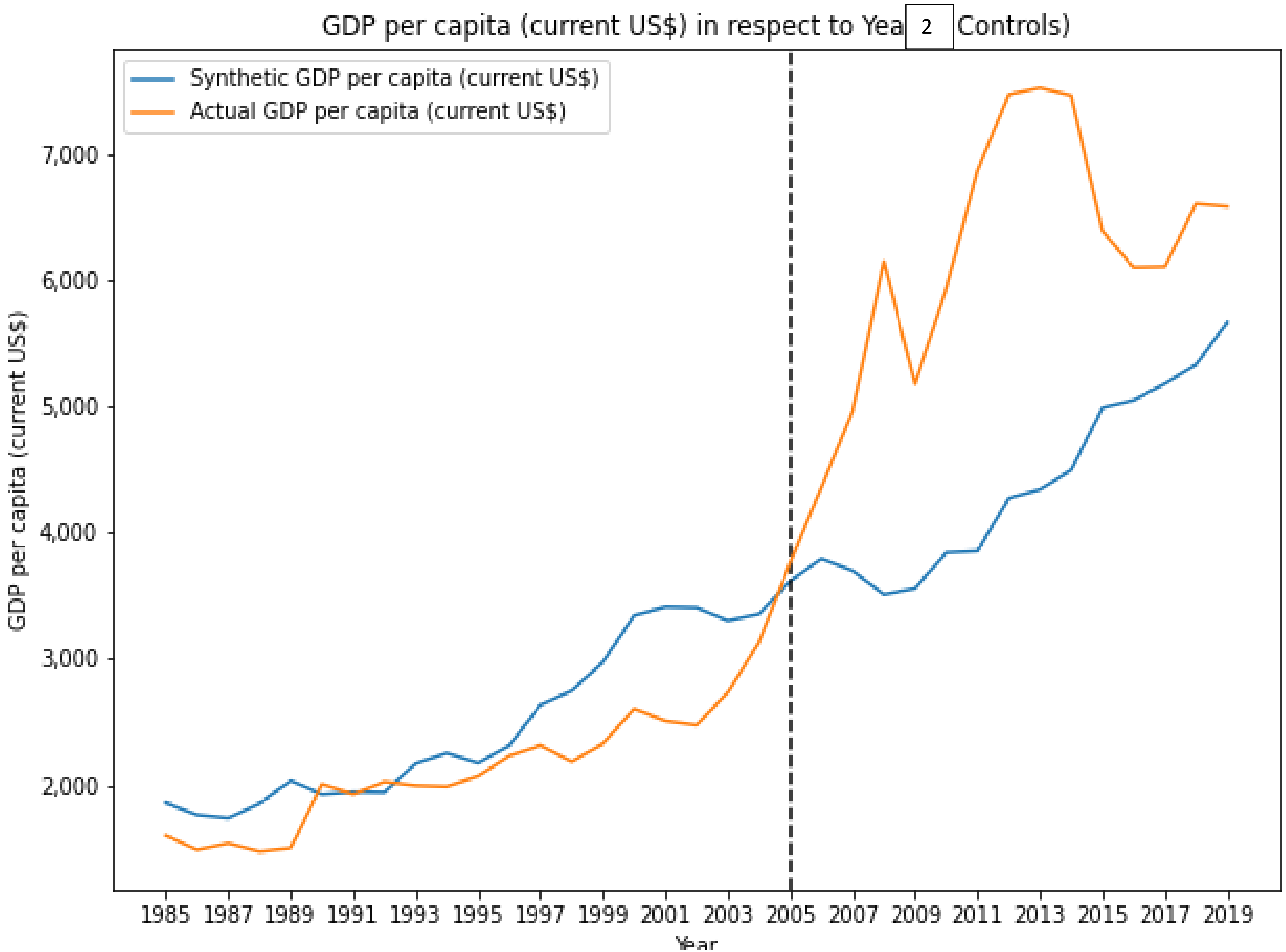
Year	Relative weights of synthetic data on actual Data
1985	109%
1990	89%
1995	97%
2000	119%
2005	90%
2010	63%
2015	77%

In 2010, the synthetic weight on the actual data was calculated to 63%. This is five years after the full removal of the tariff barriers and trade facilitation between the GAFTA member countries. In short, this showcases the importance of the agreement on G.D.P. per capita on member countries and its essential contribution to the overall health of the economic conditions in the region.

In the next section, a robustness check is made by removing one then two control units. The removed control units are East Asia and later South Asia. Then, a different treatment year is used, which 1995. The goal is to confirm the results of a shift in the G.D.P. per capita after the full adoption of the GAFTA agreement provisions in 1997, starting in 2005.

6. Robustness check





GDP per capita (current US$) in respect to Yea 2 Controls)
Synthetic GDP per capita (current US$)
Actual GDP per capita (current US$)
GDP per capita (current US$)
7,000
6,000
5,000
4,000
3,000
2,000
1985
1987
1989
1991
1993
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1997
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2013
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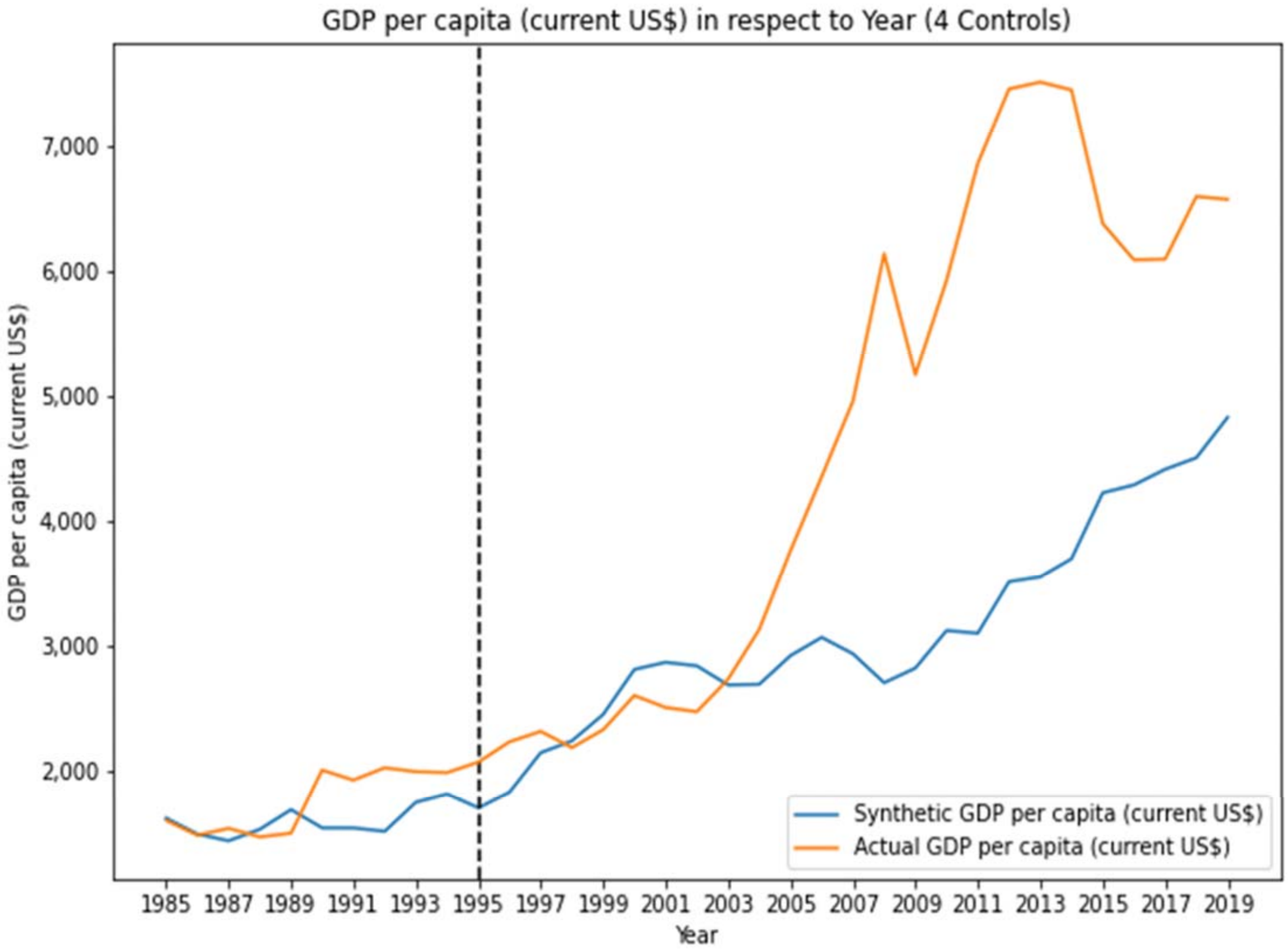
2017
2019


GDP per capita (current US$) in respect to Year (4 Controls)
GDP per capita (current US$)
7,000
6,000
5,000
4,000
3,000
2,000
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Year
Synthetic GDP per capita (current US$)
Actual GDP per capita (current US$)

Three different robustness checks are done. In the first, the East Asia control unit is removed since East Asia became a vital trading bloc of the Arab region in the 1990s and the beginning of the 2000s, as the fourth most crucial bloc for the Arab region in modern history. While removing the mentioned control unit, the results are still the same, with little if no change.

The South Asia control unit is then removed as the third most important economic bloc for the Arab region, just after the usual and significant economic blocs in the World being the European Union and the North America countries. After removing the South Asia control unit, the results are still the same. The main goal of removing the control units is to show the possibility of even predicting the same synthetic Data while comparing them with the actual data. Besides, this test also aims at reducing the differences between the synthetic and genuine data pre-treatment years.

Finally, the treatment year is shifted to 1995. In 1995, the World Trade Organization was in formation. Significant changes are expected in the region. The surprise is that steady growth is observed in the actual and synthetic data. At the same time, the two sets of data follow the same path. The conclusion is not observed in the post-2005 year. The difference is still observed between the synthetic and actual data after the year 2005.

The results can be then concluded as quite robust. The post-treatment year difference between the synthetic and actual data is still observed using two and three control units and a different treatment year.

In the next section, the thesis's conclusion is made, with an explanation of the limits of the paper that can be further improved to gain more insights in the future.

7. Conclusion

According to the results obtained through the Synthetic Control Method, a significant difference in G.D.P. per capita, especially after 2005, was observed in all models with different numbers of control units.

The difference in the value of the G.D.P. per capita is significantly higher, which marks the beginning of the full implementation of the GAFTA agreement and year of treatment.

According to the studies in the literature review, GAFTA induced a jump in the trade volume, rise in intra-trade, trade diversion, and partial removal of N.T.B.s, explaining (with other characteristics mentioned within the presentation, taken into consideration) the big jump in G.D.P. per capita.

This study provides new insights into the effect of regional trade agreements on the studied countries' economies. Indeed, for a long time, the primary purpose of studying regional integration was through tools such as trade, investment, or other mechanisms with the sole goal of quantifying later the effects on the standard of living. Within this study, the method is straightforward. It provides a better understanding of regional integration in this case on G.D.P. per capita, meaning, in other words, that standards of living in the Arab World after the full implementation of the GAFTA agreement proved to be positive.

The reasons for the big jump in the G.D.P. per capita, especially after 2005, could be explained as a manifestation of the positive effects of the GAFTA agreement for the Arab region. However, the GAFTA is a decisive long-waited step in the process of the Arab dream to establish an Arab Union. For now, this study showcases multiple findings, one of them being the economic importance of the GAFTA as the driver of economic prosperity in the region even though the financial crisis and the Arab spring. Therefore, political leaders are further encouraged to push their countries' economies upward by developing the trade rules and rules of origin of GAFTA to achieve the desired economic improvements and integration within the region.

<u>Limits of the study:</u>

- Does not take into consideration all specification of countries in the Arab region.
- The high disparities of income in the region between oil-producing countries, republics, and L.D.C.s are not included in the equation.
- Political factors, except for military expenditures, are not taken into perspective.

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