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THE VALUE OF FOOD SECTOR ON CROATIAN CAPITAL MARKET IF THE AGROKOR CRISIS DID NOT HAPPEN: SYNTHETIC CONTROL METHOD APPROACH

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Abstract

This paper explores the effects of the economic-political crisis of the biggest company-concern in Croatia, Agrokor, on the value of the food sector stock index on Zagreb Stock Exchange. Synthetic Control Methodology was applied on sector monthly data for the period February 2013 – December 2017. The results indicate that the controversies around Agrokor potentially had negative effects on the value of food industry stocks on the Croatian market. This can be interpreted that investors did not anticipate some events regarding the Agrokor concern and holding of certain stocks has fore surely affected the value of some portfolios.

Keywords: *Agrokor crisis, stock market, synthetic control methodology, stock index*

JEL Classification: *C53, G14, D53*

1. INTRODUCTION

One of the biggest economic and political events in the past several years in Croatia is the still ongoing problem with the concern Agrokor. Agrokor is the biggest concern in the Croatia, employing now 52.500 people (Agrokor 2018) in Croatia and Balkan region as well. Although, there were some controversies several years ago when Agrokor was overtaking Slovenia's Mercator (due to Agrokor's high indebtedness), major problems have come to surface since beginning of 2017. Credit agency Moodys lowered Agrokor's rating from B2 to B3 in early January 2017. This got public's attention and started an avalanche of other events as well. Since many of these events had negative connotations in the public eye, this was spilled over to the investment

sentiment and attention as well. Stocks from companies which were under the Agrokor roof were traded on Croatian stock market, Zagreb Stock Exchange (ZSE). Several of those stocks constituted the food sector index, one of five official sector indices on ZSE. However, due to many controversies regarding this concern, the value of its stocks started to drop significantly in March and April 2017. At the end of the April 2017, all of those stocks were withdrawn from trading on ZSE. They are still suspended from trading even today. The value of the food index dropped in the mentioned period as well, due to everyone selling the Agrokor's stocks because of the economic uncertainty.

Thus, the purpose of this paper is to evaluate what would be the value of the food sector index on the Croatian stock market if these events did not happen at all. In that way, one can measure the effects of particular economic and/or political event on the stock prices on a market. Moreover, if we find significant effects of such events on a stock price, some questions arise. They regard the Efficient Market Hypothesis (Fama, 1970). If it holds on a stock market, all relevant information is already embedded in stock prices. This means that if the investors did anticipated some event in a correct way, the event should not have a meaningful impact on stock prices themselves. This research is going to test this on exact chain of events regarding the mentioned concern, by observing the effects on the food sector index on ZSE, as already mentioned. Only the food sector is observed due to the nature of this concern. It mostly consists of retail, meat producer, agricultural industrial companies, etc. Two main hypothesis of the study are as follows. Investors on ZSE did not expected/anticipated such events regarding Agrokor, because the value of the food sector index would not have dropped so much so suddenly. The second one refers to: Economic and political events regarding the concern Agrokor have negatively affected the food sector index on ZSE. The contribution of this study is in the novel approach of evaluating the aforementioned effects on the stock market. Moreover, up until writing this research, we did not find any paper which tries to evaluate those effects in Croatia. Thus, the results in this study can be viewed as a starting point for future more detailed research within this field.

In order to empirically evaluate the aforementioned effects (chronological events will be described in the empirical part of the paper), Synthetic Control Methodology (SCM henceforward) will be used. This methodology was developed in order to answer questions to "what if" scenarios. Main assumption is that one of the observed units (country, firm, stock, etc.) at one point in time is submitted to a treatment. SCM estimates the values of the output of that unit if the treatment would not have happened, based upon the values of outcomes of other units in the analysis which were not subjected to the treatment. The SCM methodology can be used to test if the treatment did not happened, what the outcome of a variable of interested would be. In that way, this methodology is suitable to measure the effects of the Agrokor concern crisis on the food sector on ZSE. This is a relatively newer methodology applied in economics and finance. Thus, it is expected to gain more attention in the near future, due to its merits compared to some other methodologies. The rest of this research is structured as follows. Second section deals with empirical papers which have observed similar questions and applied the SCM methodology in their research. Third section describes the SCM methodology used in this study. The fourth section gives empirical results and interpretations, whilst last section (fifth) concludes the paper.

2. Literature review

Since the SCM methodology is relatively new in the field of economics, the majority of the literature evaluates macroeconomic, political events or events such as terrorism, natural disasters, etc. Almost no research can be found in the field of finance, since this is one of the first studies to employ SCM in this field in a way provided in this paper. Majority of the existing studies which evaluate some event and its effects on stock prices or returns utilize the event study methodology (ESM). Since in this paper we observe only one sector and its reactions to the Agrokor event, the ESM methodology could not have been employed. ESM is usually applied on a sample of stocks which all are affected by an event. However, since existing research in finance does explore some events somewhat in a similar manner as in this paper, we give a brief overview

of them as well. Thus, there are two main groups of existing research related to this one. The first group applies the SCM methodology and the second one is more focused in the field of finance (with ESM methodology).

The SCM methodology, although a newer methodology in field of economics and finance, has been already applied in many different scenarios. One group of papers estimated the effects of entering the European Union on some macroeconomic variables, such as GDP per capita, productivity, inequality, wages, etc.. Here we include: Campos et al. (2016), in which entrance to EU of 17 countries was evaluated and its effects on productivity; Bouvet (2015) observed the effect on the income inequality in several old EU members if they did not enter the Eurozone; Žudel and Melioris (2016) effects of adopting the Euro in Slovakia, in which positive effects were found on GDP per capita; Wassmann (2016) observed effects on GDP per capita for several selected EU countries when the enlargement of other countries was in place; leaving the EU was examined in Born et al. (2017), regarding the Brexit vote in 2016; possibilities due to the negotiation with EU (regarding Turkey, see Aytug et al., 2016). Other group includes estimating the effects of terrorism, war and similar political risks and bad events. Some of the research here is Abadie and Gardeazabal (2003) who observed terrorism effects in 1960s in Basque Country compared to the rest of the Spain; effect on GDP of civil wars in Algeria, Peru, Nepal and Uganda in Bove et al. (2014); armed conflict in 20 countries in Costalli et al. (2017); terrorist attacks in 2004 in Madrid and their effects on elections in Spain was observed in Montalvo (2011); ETA attacks during the 1990s in Basque and the effects on elections was estimated in Balcells and Torrats-Espinosa (2018); political risks in Chinese provinces and effects on GDP in Yu and Wang (2013); Pinotti (2012) focused on organized crime in Southern Italy. Natural disasters and events have been explored as well: Italian regions and effects on GDP due to earthquakes (Barone and Moretti, 2014); the 1995 earthquake in Japan (DuPont and Noy, 2012); positive events such as resource discoveries in 1950s on GDP per capita and distinction between developed and developing countries (in Smith, 2015). Many other applications can be found in Firpo and Possebom (2017).

Other group of papers employs what is called the event study methodology, in order to estimate the effects of any type of events on the stock return series. However, this methodology and test values are based upon a group of stocks which have undergone a treatment. Details on this methodology can be seen in MacKinlay (1997). Thus, usual questions which are tested within this methodology refer to stock prices/returns reactions to mergers and acquisitions, dividend announcements, announcements of stock market index composition changes or political and economic events which are thought to be relevant for the stock market. Some of the studies here include Miletić (2011), where dividend announcements on the Croatian stock market were observed (2007-2009) and found to be significant for investors; political events such as national elections in 27 OECD countries were the focus in Bialkowski et al. (2008); positive and negative political news in Nepal has been estimated in Dangol (2008). Elections in Greece as political events have been evaluated in Koulakiotis et al. (2016). The aforementioned Brexit was observed within this methodology as well: Burdekin et al. (2017) estimated stock market reactions to the Brexit event on EU markets (e.g. Croatia was included in the study as well, and the effects were negative on the voting day and day afterwards). Other applications can be found in Duso et al. (2010).

As it can be seen from these two groups of papers, a gap exists between them. One group focuses on one country/county/other unit of interest (or several of them) with the SCM methodology, whilst the other utilizes a somewhat similar methodology in order to test for effects of an event. Research questions and events truly can be almost anything in both approaches, due to the nature of the event whose effects wanted to be estimated and evaluated. Moreover, as it can be seen from this short overview, none of the existing research is closely linked to this one. Thus, this imposes more difficulties in the empirical part of this research in order to correctly choose adequate variables and units of observation. Finally, we did not go into detailed results of the previous research, again due to not finding those closely related to this study. As it can be seen, more work has to be done in future in order to fill the gaps in the literature.

3. Methodology

Evaluating treatment effects on one observed unit within a sample of similar units has firstly been developed in the field of economics in Abadie and Gardezabal (2003) and Abadie et al. (2010, 2015). The Synthetic Control Method assumes that one unit has been subjected to the intervention (treatment) at date T_0. The goal is to evaluate treatment effects on that unit compared to the non-treated ones. Assume the researcher has data on J units (sector indices) and the first unit was subjected to the intervention only. Denote with $y_{i,t}^N$ outcome of the variable of interest for unit i in time t, where $i \in \{1, 2, \ldots, J\}$ and $t \in \{1, 2, \ldots, T\}$. If a unit is subjected to a treatment, denote the outcome variable with $y_{i,t}^I$, with the treatment date T_0 being such that $1 \leq T_0 < T$. It is obvious that $y_{i,t}^I \equiv y_{i,t}^N$ holds for $t \in \{1, 2, \ldots, T_0\}$. The effect of the treatment on the fist unit at date T_{0+1} up until T is calculated as $\alpha_{1,t} = y_{1,t}^I - y_{1,t}^N$. Thus, in order to estimate $\alpha_{1,t}$, one has to estimate $y_{1,t}^N$ first. In Abadie et al. (2010, 2015) it is assumed that each $y_{1,t}^N$ follows a factor model $y_{i,t}^N = \gamma_t + \theta_t^{'} Z_i + \lambda_t^{'} \mu_i + \varepsilon_{i,t}$, where γ_t is common factor with unknown constant factor loadings, θ_t is vector of unknown parameters, Z_i vector of observed covariates not affected by the intervention, λ_t vector of unobserved common factors, μ_i vector of unknown factor loadings and $\varepsilon_{i,t}$ is vector of white noise processes.

The name synthetic in the SCM comes from constructing a synthetic value of $y_{1,t}^N$ based upon other J-1 units which were not submittet to the intervention. Thus, denote with $\boldsymbol{w}$ vector of weights for those remaining units int he analysis, such that $w_i \geq 0$ and $\sum_{i=2}^{J} w_i = 1$; with $\boldsymbol{K}$ the vector of linear combination coefficients before the intervention such that it holds: $\overline{y}_i^K = \sum_{s=1}^{T_0} k_s y_{i,s}$, i.e. the i-th unit outcome y is the linear combination of pre-intervention outcomes. Next, $9_1 = (Z_1^{'}, \overline{y}_1^{K_1}, \overline{y}_1^{K_2}, \ldots, \overline{y}_1^{K_M})$ is a vector of pre-intervention characteristics of the first unit (subjected to the treatment) and 9_0 is a matrix of all pre-intervention characteristics of all other J-1 units in the analysis. The goal is to minimize the following distance:

$$\arg\min_{\boldsymbol{w}} \left\| \boldsymbol{X}_1 - \boldsymbol{X}_0 \boldsymbol{w} \right\|_V \text{ s.t. } w_i \geq 0 \text{ and } \sum_{i=2}^{J} w_i = 1, \quad (1)$$

i.e. to minimize the distance between X_1 and the synthetic $X_0 w$, where V is the distance matrix. This matrix is chosen based upon: (i) previous knowledge of researcher on the relative importance of each variable in the model or (ii) let the data pick the best values in V^* in order to truly minimize the distance between real values and the constructed/synthetic ones. This other approach is advised in the literature (see Abadie and Gardezabal, 2003). Thus, model (1) is optimized in two steps: in the first step, inner problem is solved in order to obtain values of V^*. In the second step, model (1) is optimized with V^* and $w^*(V^*)$ is found. In that way, the mean squared error in the pre-intervention period is minimized.

Inference of SCM models is being developed only in last several years. First group of papers which employ this methodology followed the advice in Abadie et al. (2010, 2015), regarding the graphical representations of the treated first unit and repeated procedure on other units – placebos. Moreover, if we have enough data in the pre-intervention period, we can optimize model (1) based upon one part of that period and minimize the mean squared error for the second subsample (see Cavallo et al. 2013 for details). Adhikari and Alm (2016) define a fit index which can be used (it is a ratio between mean squared error of the observed model and the benchmark mean squared error with no predictors in the analysis). Goodness of pre-treatment fit can be calculated as well, something similar to the coefficient of determination in regression (ses Ferman et al. 2017). The second group of papers is emerging in the last 2-3 years, in which the placebo tests are getting higher recognition. These are, in essence, permutation tests in which all of the units are evaluated as the treated first one, the whole procedure is repeated on all of the units and then the inference is being constructed

based upon bootstrapping – in space placebo. Based upon those permutations, null hypothesis of no intervention effects can be made, with the *p*-value being constructed based upon the probability that the treatment effects of other placebos are greater than the treatment effect of the first unit: $p-v=P\left(\left|\hat{\alpha}_{j,t}^{pl}\right|\geq\hat{\alpha}_{1,t}\right)$, where where $\hat{\alpha}_{j,t}^{pl}$ is the effect of the treatment on remaining $J-1$ units (Abadie et al. 2015).

However, Firpo and Possebom (2017) show that not all of the first unit treatment effects have to be different in each post-treatment date, so the *p*-value can be constructed based upon the ratios of the mean squared errors of the placebos and the fist treated unit as follows: $p-v=P\left(RMSE_{j,t}^{pl}\geq RMSE_{1,t}\right)$. When we construct the *p*-values, the confidence intervals of estimated treated effects can be constructed as well. More details on SCM methodology can be found in Ando and Savje (2013), Firpo and Possebom (2017), Ferman and Pinto (2017a, b), Ferman et al. (2017), Galiani and Quistorff (2017) and their references as well.

4. Empirical results

4.1. Data description and some key points about Agrokor problems

The following data was collected for the empirical part of the analysis from ZSE (2018): daily values and turnovers (in HRK) of sector indices: food, construction, industry, tourism and transportation (abbreviations in the rest of the paper as follows: FOOD, KONS, IND, TUR and TRAN) for the period February 1st 2013 – 31st December 2017. The chosen time span was due to sector indices being introduced and calculated on ZSE from February 2013. Moreover, based upon the values of each of the sector, compounded returns were calculated for every day. Next, in order to obtain monthly data, daily returns were averaged for each month separately. Other following measures were calculated as well: standard deviation, coefficient of asymmetry and coefficient of skewness for each return distribution each month. Thus, we choose only the characteristics of monthly return distributions for each sector and the addition of the total market turnover for each sector in each month. The reasoning is twofold. Firstly, the problems of potential hairdressing of financial statements of the firms (especially regarding the Agrokor concern) could have affected the results in a wrong way. Moreover, since we use the sector indices in the analysis, questions arise how to aggregate individual results from financial statements. And secondly, the Modern and Postmodern Portfolio Theory base their analysis on the investor's utility function which depends upon the first m moments of the return distributions. Early work as Arditti (1967) shows that investors prefer positive skewness of returns (due to decreasing absolute risk aversion); and Müller and Machina (1987:351) theorem: "An expected utility maximizer with continuous von Neumann-Morgenstern utility function U(.) will rank probability distributions on the basis of their first m absolute moments if and only if U(.) is a polynomial of at most degree m." Details on the importance of first four moments of the return distribution can be found in Škrinjarić (2013, 2014) or Gardijan and Škrinjarić (2015). Other market based measures such as the CAPM beta are not used, due to many previous empirical research on ZSE which found them to be questionable on a market such as the Croatian one (see Perković, 2011; Tomić, 2013 or Odobašić et al., 2014). All of the calculations were made in environment R.

Before the empirical analysis, let us state some of the facts regarding all of the happening with the concern Agrokor, to have a better understanding of the problems which have been accumulating over the years. The accelerated expansion of the concern Agrokor over the last decade to Bosnia and Herzegovina, Hungary and Serbia was followed by even greater expansion of its debts. Growth rate of Agrokor, as well as operating profit growth rate, was lower compared to the borrowing rate. Moreover, entrance of other small retailer industries, such as Kaufland and Lidl, into the Croatian market was getting increased market shares over the years. This affected the business of Agrokor as well. Public attention was caught in 2014 when Slovenia's Mercator was overtaken by Agrokor, due to Agrokor's great indebtedness. More details on other economic and political events which were accumulating slowly over the years are given in Klepo et al. (2017) for those

interested. However, major events which started to get a lot of attention were the following ones. Firstly, at the end of 2016, the Croatian Bank for Reconstruction and Development granted new loans to Agrokor. This was due to Agrokor not being able to pay back the matured debts. At the beginning of January 2017 the credit agency Moodys lowered Agrokor's credit ranking from B2 to B3 as a result. Another lowering of the credit rating was again in February 2017. Thus, beginning of 2017 is observed as a starting point when problems started to get public and were getting more and more attention from the public as well.

A chain of mostly political event started to unfold. Croatian parliament appointed new extraordinary commissioner of the Agrokor. Next, new legislation regarding specifically Agrokor was considered and brought very rapidly in order to solve some of the piling up problems. In March 2017, several meetings between the Croatian government and Agrokor's management occurred; and due to animosities in the Parliament, the president of the Croatian Parliament B. Petrov gave a resignation, with him submitting a criminal charge against Agrokor's Management at the end of March last year. Afterwards, emails regarding communication between some people from the Government and Agrokor got to the public. From those emails it was obvious that some relevant people knew for years what was going on. Prices of several stocks which are listed on ZSE dropped in March and April 2017 significantly (more than 90% for majority of stocks), with the food sector index experiencing a sharp drop as well, and turnover in that sector experienced a rise in those two months (see figure 1.). At the end of April 2017, all of those stocks were withdrawn from trading on ZSE and were delisted from the food index sector as well. Interest of the public for these issues has risen, as mentioned, from January 2017, which is visible on figure 2. The problems are still ongoing even today. Thus, it is expected that we will find significant results in the empirical analysis. More details from a political economy standpoint on Agrokor and crony capitalism can be found in Ivanković (2017), from a legal standpoint in Rubinić and Bodul (2018) and total situation from economic, political and legal point in Klepo et al. (2017) or Grubišić-Šeba (2018a, b).

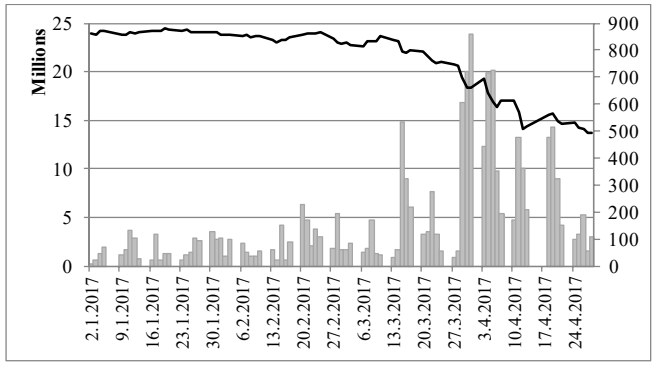


Figure 1.
Value of food index on ZSE (black line, right axis) and turnover in mil HRK (left axis), Jan-Apr 2017

Source: ZSE (2018)

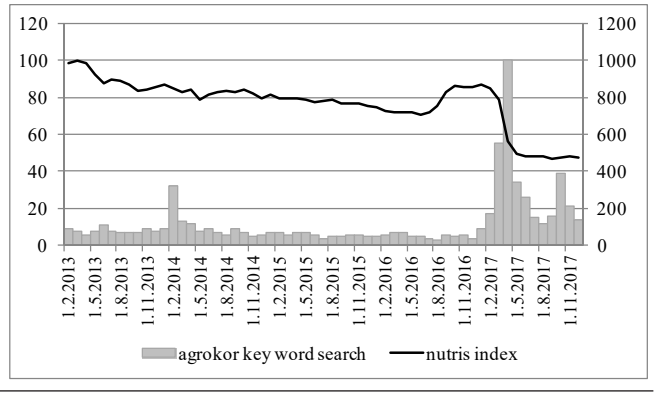


Figure 2.
Google search volume of keyword Agrokor (normalized values, left axis) and value of food index (right axis), total observed sample

Source: ZSE (2018), Google trends (2018)

4.2. Results from the estimation

The whole time sample was divided into two subsamples, based upon the treatment date T0, which was determined to be January 2017. For the pre-treatment period, the model (1) was optimized based upon the returns, standard deviations, skewness, kurtosis and turnover. The treated unit is the food sector (FOOD), and the variable of interest was the value of the FOOD index. Based upon other 4 sector indices and their characteristics, the results from the model (1) are shown in table 1, where average values of the predictor variable in the pre-treatment period are compared between the treated (real) value of FOOD sector and the constructed synthetic one. The biggest difference occurs in the values of the coefficient of kurtosis. Moreover, last column of table 1 depicts the optimal values of each predictor in constructing the synthetic FOOD index value. It can be seen that greatest values are given to the turnover, skewness and return series. This means that this is the optimal combination of weights to the predictor variables in order to achieve the optimal value in model (1); where the optimal mean squared error value for this model resulted with value 0.303. The result of the second step of the optimization process is shown in table 2, where optimal weights for each of the non treated sectors are given. The construction sector had the greatest weight in the linear combination of the synthetic FOOD index in the pre-treatment period. On the other hand, tourism sector did not enter the construction of the synthetic value of the FOOD index. Interpretation of the optimal values depends upon the study of interest. Here, we can say that if the investor wants to make forecasts on the FOOD sector, he can make them based upon the structure of the weights in tables 1 and 2.

Table 1. Optimization results of model (1) for the pre-treatment period

Variable	Treated value	Synthetic value	V^*
Return	0.000	0.000	23.3%
Standard deviation	0.007	0.014	3.5%
Skewness	0.079	0.096	26.1%
Kurtosis	0.344	0.905	3.4%
Turnover (mil HRK)	17.882	16.616	43.8%

Source: author's calculation

Table 2. Optimal weights of non treated sectors in the synthetic FOOD index

Sector	Tourism	Industry	Construction	Transportation
w^*	0	35.9%	44.5%	19.6%

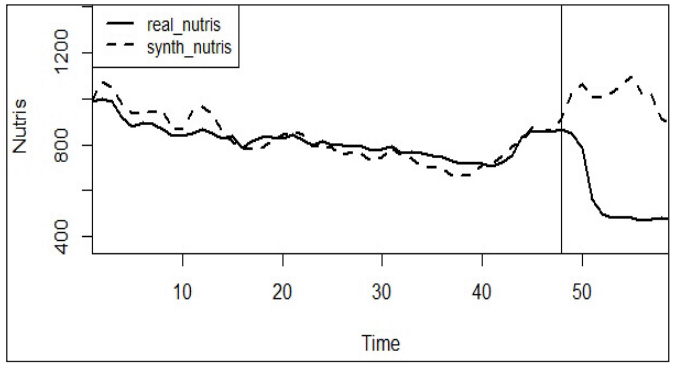
Source: author's calculation

Next, the values of the real FOOD index were compared to the constructed synthetic one, on figure 3. It can be seen that the model was fairly good, due to close resemblance between the two series in the pre-treatment period. Moreover, the difference is obvious after the treatment date T0, which is marked with a vertical line. The result can be interpreted twofold. Firstly, if the investors did anticipated all or some of the events regarding concern Agrokor, the sharp drop of the value of the FOOD index (real_nutris) would not have happened. Secondly, the value of this sector, based upon the results, would have been much greater compared to the real value. Although, there would be a drop in the value at the end of 2017, the losses would not have been as they really were.

It remains to test the inference whether the difference between the two series is significant or not. For this question, we follow the procedure described in Firbo and Possebom (2017a), in order to calculate confidence

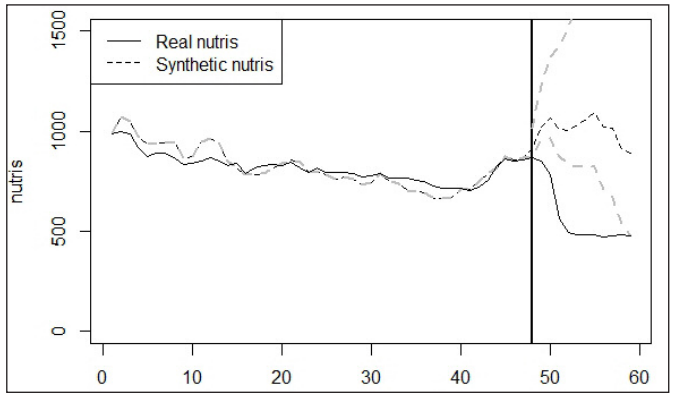
intervals based upon the p-values calculated from the ratios of the mean squared predicted errors as described in the methodology section. These confidence intervals are constructed and shown on figure 4. Since we have only 5 sectors in total, the permutation test allows us to calculate 1-(1/5)100% confidence intervals, which gives us 80%. Thus, the gray dashed lines denote the 80% confidence interval set. It is visible that for the whole post-treatment period, the real value of the FOOD index lies beneath the lower bound of the confidence interval; meaning that the difference is significant and the effects of Agrokor concern crisis are statistically significant in the observed period.

Figure 3.
Values of real and synthetic FOOD index, for the whole period



Source: author's calculation

Figure 4. Comparison of real and synthetic FOOD index, confidence interval bands constructed as in Firpo and Possebom (2017a)



Source: author's calculation

Finally, some descriptive statistics has been calculated for the real and synthetic sector values. The return series in the post-treatment period are shown in figure 5. The major effects can be seen in the March, April and May of 2017, when the drop of the FOOD sector was the greatest. Detailed results are shown in table 3, where bolded values denote better results when comparing the two series based upon the statistics in the first column. It can be seen that when comparing all of the values, the actual return series on the FOOD sector were worst compared to the synthetic return series. The average return was actually loss, as well as the median value; due to greater volatility in the post-treatment period, the standard deviation was greater and the skewness was, as expected, more negative. Similar interpretations can be made for other measures as well. In the end, one can conclude that based upon the results given in the analysis, both hypothesis from the beginning of the research were confirmed.

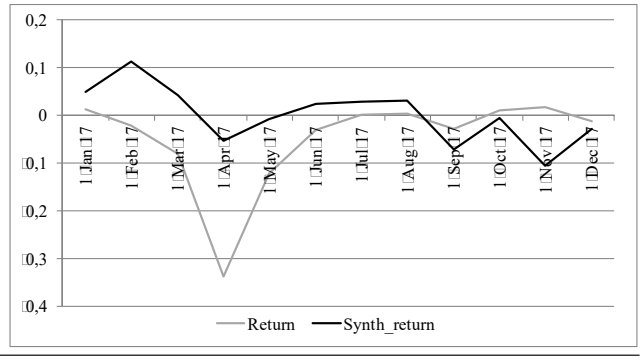


Figure 5. Comparison of real and synthetic returns on FOOD sector, post-treatment period

Source: author's calculation

Table 3. Comparison of characteristics of real and synthetic returns on FOOD sector, treatment period

Descriptive statistics	Return	Synth_return
Mean	−0.04868	0.002059
Median	−0.01659	0.010117
Standard deviation	0.099843	0.059738
Kurtosis	7.214462	0.093824
Skewness	−2.57711	−0.09058
Minimum	−0.33796	−0.10493
Maximum	0.017582	0.113649

Source: author's calculation

5. Conclusion

Different events which occur in an economy can affect the stock market and investors' portfolios as well. If the value of stocks on a market experience significant swings, the validity of the Efficient Market Hypothesis is questioned. This paper tried to explore the effects of the economic and political events regarding the concern Agrokor on the value of food sector on Zagreb Stock Exchange by using SCM methodology approach. Since significant (negative) effects were found in this study, it can be concluded that such methodology can be used in future as well: when other events start to unfold regarding a company, investors could anticipate how this could affect stock prices or returns. In that way, well-timed decisions regarding investment portfolios can be made in order to achieve investment goals regarding portfolio risk or/and return.

Contribution of the study lies upon quantifying the effects of the Agrokor crisis concern on the food sector index on Zagreb Stock Exchange, by using only market data. Since results indicate that effects are significant, this gives hope that SCM methodology can be used in future research as well in order to evaluate potential effects of other positive or negative events on stock prices; not only on the Croatian market, but other markets as well. However, the shortfalls of the study were as follows. We used only the market available data, due to problems of hairdressing the financial statements. Investors usually perform (or should perform) in depth analysis before making investment decisions. Thus, other variables should be taken into consideration when conducting any type of analysis. Future work is going to include finding what other relevant factors could be when carrying out similar analysis regarding financial data.

Other opened questions remain for future work as well. They include evaluating the effects of other meaningful events on the Croatian and other similar stock markets; on the individual stock levels as well; trying to connect the SCM methodology with the event study methodology in order to get more insightful information. There is hope that this work fulfilled a part of the gap in the literature, and that future research will focus more on the remaining questions from this research.

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