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AN ANALYSIS PERTAINING TO THE COMPARISON BETWEEN THE EUROPEAN UNION MEMBER STATES AND TURKEY WITHIN THE SCOPE OF MAASTRICHT CRITERIA

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Abstract *The research has set its sight on the assessment of Turkey's economic performance with that of the EU member states in terms of the concepts of Maastricht Criteria. Among the criteria considered are five featured variables comprised of inflation rate, long-term interest rate, budget deficit, government debt stock, and exchange rate. Right off the bat, the illustrious factor analysis is applied to 2017 data, then the pivotal variables about fiscal discipline and monetary discipline are punctiliously calculated, and finally an accurate ranking of states is created for each individual indicator. It is found that Turkey relatively fails to reach the monetary discipline when it comes to analyze the ranking obtained from factor analysis, while relatively managing to accomplish the fiscal discipline. Herein the*

Wilcoxon W Statistics Test is used to address the question, do the rankings vary by position – Eurozone or Non-Eurozone – of states? Consequently, such an intriguing conclusion is drawn like that no matter what position a state has, it is traditionally distinguished by its monetary discipline, not its fiscal discipline as a rule. Starting from this point of view, the fiscal discipline should also be regarded as an important benchmark to be carefully observed as equally as the monetary discipline for the states in Eurozone, but it goes without saying eventually more attention is paid to monetary discipline than fiscal discipline in real-life world. However, when it comes to compare the performance of Turkey which is an outstanding state has yet to manage to be a member of EU with that of European Union member states, Turkey's enthusiastic efforts germane to achieve a satisfactory fiscal discipline should be deeply appreciated by the EU. Whereas, given the present miserable situation of Greece which has been an EU member state experiencing the same economic convergence and standing in the identical domain of attraction with Turkey but also disastrously departing from monetary discipline for years, Turkey's infelicitous divergence from maintaining a stable monetary discipline should be advisably regarded tolerable by EU.

Keywords: European Union, Turkey, Maastricht Criteria, Wilcoxon W Statistics Test.
JEL Codes: E52, E62, F15, O52

I. Introduction

The European governments, remembered notoriously for their cutthroat battles to dominate each other over the centuries, finally managed to get on the same page about a universal integration movement by staking a claim on the idea of creating a common future for themselves in the last centennial. Initially showed up as merely a market integration, the movement has ended up at the European Union (EU) with 28 member states by marvelously proliferating and growing in the advancing years. Originally setting out with the aim of improving the living standards of European nations to be united, EU eventually has gained a political influence that allows its member states to be represented in the aggregate and undertake the role of a global actor in the international community step by step going beyond the initial target of forming purely a market integration. At the current stage of development, the EU has become a prominent economic and political power which is not only taken as an

example and inherently desired to be converged by non-member states but also a trend setter for its member states.

The main constituent that makes the EU peerless in the presence of third states is no doubt its offerings like a good welfare level and a high living standard. EU is trying to achieve a target of noninflationary economic growth through supervising the creation of market integration as well as establishing an economic and monetary union in the markets to be integrated. The healthy working of an economic and monetary union requires a tight monetary and fiscal policy to be implemented proactively. The terms peculiarly devised for this objective, the Maastricht Criteria includes a series of parameters that are mandatory to be adopted by the Eurozone states but expected to be approached by non-member states. Herein the target defined by these values and norms that are assumed to be embraced by all member states is comprised of a three-phase plan: in the Europe, creating economic stabilization in the short-term; achieving the potential rate of growth in the mid-term; and stringing along with changing conditions (aging population, immigration phenomenon, digitalization, globalization, etc.) in the long-term.

The objective of this study is to scrutinize the present state of Turkey – aspiring to integrate with the EU – within the frame of Maastricht Criteria and develop appropriate policy recommendations. Accordingly, a better approach for Turkey seems to be readily adopting the values and norms of the EU, and perpetually rejuvenating the efforts devoted to achieving the target indicators, for the sake of improving distance covered in the negotiations. In this context, the study is built on screening the economic performances of EU member states and Turkey on the axis of Maastricht Criteria, which is consisted of five parameters such as inflation rate, long-term interest rate, budget deficit, government debt stock, and exchange rate. Within the scope, a brief literature research will be presented at first, and then the methodology applied (factor analysis) will be explained in detail, and finally the policy recommendations will be presented in the light of findings, in the following sections.

II. Economic and Monetary Union: Central and Peripheral States, and Turkey

Following the collapse of Bretton Woods system, Europe of 6 reached a mutual understanding on the objective of the progressive realization of Monetary Union, at the beginning of 1970s. Within the framework of Werner Report, the European Monetary System mainly based on the

pillars of ECU (European Currency Unit), ERM-I (Exchange Rate Mechanism-I), and credit mechanism was founded in 1979. It was an important step towards the engendering of European Economic Community. While expanding to peripheral states and gaining depth through the establishment of internal market via a gradual customs union, the European Economic Community would be headed to a new integration movement later to be called European Union (EU) by 1990s. Through the agency of Delors Report replacing the previous plan, this time Europe of 12 reached a new mutual understanding on the creation of an economic and monetary union based on Maastricht Treaty which came into force in 1993.

The Maastricht Treaty principally aims to create a common market, as well as realizing a noninflationary sustainable growth via the targets of building an economic and monetary union, creating more and better employment opportunities, improving competitiveness, and rising living standards and quality of life. To this end, the EU agencies and institutions are entrusted with full authority of defining and implementing the monetary and single currency policies by the Maastricht Treaty. It is suggested that all these steps shall cardinally result in price stability, reasonable public finance, and sustainable balance of payments. The European Monetary System – identified with ECU – was replaced by an entirely new monetary pillar where 17 states participated, and the Euro used as single currency in 1999. As of today, Euro is used as local currency in 19 member states of EU which is comprised of 28 members with divergent development levels. Seven member states use their own national currencies while trying to meet required conditions for single currency and exchange rate policies that will enable them to have an economic convergence in line with their economic realities. In other words, there are two intertwined circles in EU: the first is the European System of Central Banks (ESCB) which is consisted of the European Central Bank (ECB) and all the central banks of the EU members, and the second is the Eurosystem which is consisted of ECB and only the central banks of states included in Eurozone. The mission of ECB is to maintain price stabilization in both domains whether in a narrow-scoped or a comprehensive manner. In the new monetary system, Euro is located at the center, while the currencies of non-Eurozone EU members are allowed fluctuating against Euro in a limited range (±15).

Founded by the provisions of Maastricht Treaty, the Economic and Monetary Union (EMU) has four components: (i) single currency (Euro), (ii) Eurosystem, (iii) Exchange Rate

Mechanism II (ERM II), and (iv) Maastricht Criteria. Entailing mandatory threshold values for single currency use, Maastricht Criteria is designed to serve the purposes of guarding Euro to make it a strong and stable currency, maintaining efficiency in monetary and exchange rate policy, and preparing the economies of member states to approximate to each other. Also, it is targeted to ensure price stabilization and monetary stability by precluding depredatory devaluations via the threshold values of inflation and long-term interest rate (Temür*et.al.*, 2014). The monetary policy and its implementations are included in the EU's exclusive competence, and their strict threshold values are set by the provisions of Maastricht Treaty.

On the other hand, it is aimed to protect monetary union through budget discipline and solid public finance in case of any inflationist pressures. Setting the threshold values and the rules of fiscal policy are pushed back by a Protocol attached in an addendum in Maastricht Treaty. The reference values about fiscal discipline are defined by the Stability and Growth Pact (SGP) which was first constituted in 1997 and revised three times in the following process. Contrary to the monetary policy and its implementations, the power to define and implement the fiscal policy is left to the member governments.

When it is viewed today's outlook of the Europe 28, it is observed that there is a multi-speed Europe. There are already 19 states (Germany, Austria, Belgium, Estonia, Finland, France, Netherlands, Ireland, Italy, Spain, Luxemburg, Malta, Portugal, Slovenia, Cyprus, Slovakia, Greece, Lithuania, Latvia) joined to the EMU. In fact, there are two states (United Kingdom and Sweden) which provide the necessary requirements of EMU but prefer to stay out of both EMU and ERM II. And, there is only one state (Denmark) which both provides the necessary conditions of EMU and prefers to join to ERM II but stands outside the EMU.

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EMU and ERM II (Akçay, 2012). With the statute of candidate state, Turkey tries to harmonize its own economic indicators to the EU's benchmarks by taking various measures but mainly the economic convergence criterion as example.

As obvious, a new transition phase was inaugurated in Turkey's EU membership process which was initially kicked off by the Ankara Agreement in 1959, and the accession negotiations on 35 chapters were officially launched in conjunction with the adoption of Negotiation Framework Document by the European Union in 2005. The 17th chapter titled "Economic Monetary Policy" virtually includes critical themes like the independency of central banks in Member States, prohibition of funding of the public sector by central banks and prohibition of privileged access of the public sector to financial institutions. By force of 17th Chapter, the candidate state must accept to comply with the economy policies prevailing in the EU, be liable to financial audit rules of SGP, comply with the Maastricht Criteria, and finally recognize Euro as local currency following the accession. Consequently, it becomes more of an issue now to figure out where Turkey stands compared to member states in terms of Maastricht Criteria.

III. Conceptual Background and Objective of The Study

There are numerous researches about various dimensions of EU-Turkey relations. And, it is observed that those researches are scattering in a wide range of qualitative and quantitative areas, and the number of those researches significantly increases particularly in the period following the beginning of accession negotiations.For instance, Turanlı*et.al.*(2006) identify two clusters in their work involving with cluster analysis in which Turkey ranks in the cluster of candidate states, and then they draw a conclusion that the obstruction preventingTurkey from being EU member is political. In her work using the methodology of qualitativeresearch, ÖzkanGünay (2007) asserts that Turkey would be assessed as a state with low-risk in the international markets thanks to the environment of confidence formed by the start of negotiations, and concordantly there would be a significant rise in foreign investment inflow which would help avoid any possible economic crises, and finally Turkey could quickly realize the economic transformation required for membership in case of the positive atmosphere is accompanied by structural reforms. Similarly, preferring the methodology of qualitative research, Akçay (2008) puts that serious structural reforms are needed to meet the

monetary requirements after stating that Turkey complies with the economic conditions of Copenhagen Criteria and the financial provisions of Maastricht Criteria. In another qualitative research, Akçay (2011) claims that Turkey will positively contribute to the EU economy by foregrounding its advantages like a dynamic economy, young population, and geographical location in case of a full membership. In his work based on cluster research, Berberoğlu (2011) purports that Turkey preserved its financial stability even though it did not receive much help from EU during the global economic crisis of 2008, and with its strong economy Turkey will positively contribute to the member states in case of its probable participation. In their study employing multivariate statistical analysis, Kıral and Esen (2013) state that Turkey is in a much better position than that of many EU member states like Estonia, Latvia, Lithuania, and Romania according to 2009 data, and Turkey should proactively sustain the efforts for managing the reform process and meeting Maastricht Criteria.

In no uncertain terms, the examples – whether qualitative or quantitative – given above generally suggest Turkey to meet the standards required for EU membership by evaluating it in the axis of mutual advantages. As known well, Turkey has been preparing for EU membership for more than a half-century. In this context, the target of establishing customs union framed by Ankara Agreement was attained in 1996, and the preliminary requirement necessary for the next stage is successfully met. Turkey was entitled to have the statute of "candidate state" in 1999, and the accession negotiations were launched in 2005. Whether the negotiations result inmembership or not actually depends on if Turkey would adapt whole the legal rules of EU as well as meeting a series of political and economic requirements. Therefore, a better approach seems to take cautious steps in the processes of periodically measuring the distance covered and continuously updating it. The research has an aim of pinpointing the mutual efforts between the EU member states and Turkey within the frame of Maastricht Criteria, and some constructive suggestions for the negotiations will be offered in the following sections.

IV. The Methodology of Study and The Data Used

In this study, the factor analysis is embraced as an appropriate statistical technique to compare the states for the factors of monetary discipline and fiscal discipline. This is a technique which aims to explain the observable data in terms of unobservable factors. In the technique, y_1, …,

y_p values that are the standard form of pp observable variables are expressed as weighted aggregate of q factors with standard chance variables like $F_1, \ldots, F_q$.

$$y_i = a_{i1} \times F_1 + \cdots + a_{iq} \times F_q, i = 1, \ldots, p. \quad (1)$$

Because the factors are standard chance variables, it must be noted that their average must be zero, while their variance 1. The equations indicated in (1) are called factor structure. It is often preferred to keep the number of factors less than the number of observable variables for simplicity. The chosen condition can be mathematically expressed below in the equation (2).)

$$q < p\, q < p. \quad (2)$$

Another preferred condition occurs when the factors are unrelated. This case can be mathematically expressed below in the equation (3).

$$Corr(F_{j_1}, \quad F_{j_2}), j_1 \neq j_2 = 1, \ldots, q. Corr\left(F_{j_1}, F_{j_2}\right) = 0, \quad (3)$$

The left side of the equation, $Corr(F_{j_1}, \quad F_{j_2})$ denotes the correlation between F_{j_1} and F_{j_2} factors. If the correlation is zero, then F_{j_1} and F_{j_2} factors are uncorrelated. This lack of correlation can be evaluated as independency in case of the F_{j_1} and F_{j_2} factors are normally distributed. That means each factor has independent effects on the observable variable. Finding the factor structure amounts to figuring out the loads of $a_{i1}, \ldots, a_{iq}$. The loads are the correlations between observable variables and factors. The factors can be conceptualized when the correlations approach to 1. When this is possible, it is not necessary to make factor rotation. However, it is unavoidable to make factor rotation for conceptualizing the factors in the contrary case. When this is the case, the vertical rotation is tried at first, and afterwards if it fails to conceptualize, then horizontal rotation technique is tried. In a version of SPSS packaged software, there are some vertical techniques like quartimax, varimax, and equamaz and some horizontal techniques like promax, and directoblimin rotation. Of course, first you need to extract the factor structure in one way or another for doing all these. There are tools specially devised for that like maximum likelihood, alfa factoring, and image factoring. Among them is the principal components tool. For the tool mentioned last, it is enough to divide the basic components by their standard deviations to identify the factors. In this case,

the factors and the basic components are meaningfully identical even though their values are different only in dimension (Korkmaz, 2000).

Before the factor analysis is applied, it should be questioned if it is applicable or not. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity are used for that procedure. The factor analysis is verified to be applicable when Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is greater than 0.5 or Bartlett's Test of Sphericity proves that there are correlations between observable variables.

The question is that: "Is it possible to apply factor analysis to the Maastricht Criteria information of member states?" To this end, the information about the Maastricht Criteria should be closely inspected. Maastricht Criteria strictly require member states to comply with the criteria determined by five variables. The first four (inflation rate, long-term interest rate, ratio of budget deficit to GDP, and ratio of government debt stock to GDP) of the variables are proportional values. However, the last one (the variable which denotes if a currency of a state has been devaluated over the last two years) is a quantal response. The last criterion has become meaningless since the introduction of the Exchange Rate Mechanism II along with the circulation of Euro. Because ERM II has created a structure which puts Euro in the center and clusters the other national currencies around it. In other words, the national currencies of member states included in the European System of Central Banks (ESCB), are permitted to fluctuate only against Euro by predetermined central rates, while not permitted to change against any other currencies (Akçay, 2014).Because of all these reasons, the devaluationcriterion which is the fifth of Maastricht Criteria is void. Of course, the same is not true for the first four criteria, because they are valid.

The variables of Maastricht Criteria may be listed as follows (AB Bakanlığı, https://www.ab.gov.tr/_301.html):

(1) Inflation Rate

The rate can differ by only 1.5% from the level set by the average annual inflation rates of first three best performing states in inflation.

(2) Long-term interest rate

The rate measured on the base of government bonds and alike securities for a period of 12 months can differ by maximum 2% from the level

determined by the average long-term interest rates of the first three best performing states in price stability.

(2) The Ratio of Budget Deficit to GDP

The rate should not exceed 3%.

(3) The Ratio of Government Debt Stock to GDP

The rate should not exceed 60%.

(5) Devaluation

The national currency of a member state should not be devaluated against the national currency of another member state in the last two years.

The Keiser-Meyer-Olkin measure should be considered before trying to create the factor structure through the observation values of Turkey and 27 European Union member states (except Estonia). If the measure is greater than ½ then it means it is possible to make the factor structure. Another option is Bartlett's Test of Sphericity. In this test, the correlation matrix of R and the unit matrix of I are defined as follows:

H_0: R=I Correlation matrix is the unit matrix (The correlations between variables are insignificant).

H_1: R≠I Correlation matrix is different than the unit matrix (The correlations between variables are significant).

In this test, rejection of the hypothesis of "Correlation matrix is equal to unit matrix" means that there is a correlation between variables and factor analysis can be conducted. In the study, 2017 data about the first four parameters of Maastricht Criteria are considered in accordance with the aim of research.

The analysis includes Turkey and EU member states, while Estonia - an EU member state – is excluded because of lack of data. The data about the EU states are gathered from European Statistical Office (EUROSTAT), and a part of the data about Turkey is collected from The General Directorate of Budget and Finance Control (BÜMKO). The data used are all listed in Table 1.

Table 1: The Maastricht Criteria of Member States and Turkey (2017)

THE INDICATORS OF MAASTRICHT CRITERIA OF MEMBER STATES AND TURKEY

States	Inflation Rate*	Long-Term Interest Rate**	Budget Deficit / GDP***	Government Debt Stock / GDP****
EUROZONE STATES				
Germany	1.7	0.32	1.3	64.1
Austria	2.2	0.58	-0.7	78.4
Belgium	2.2	0.72	-1	103.1
Estonia	3.7	-	-0.3	9
Finland	0.8	0.55	-0.6	61.4
France	1.2	0.81	-2.6	97
Netherlands	1.3	0.52	1.1	56.7
Ireland	0.3	0.8	-0.3	68
Spain	2	1.56	-3.1	98.3
Italy	1.3	2.11	-2.3	131.8
Cyprus	0.7	2.62	1.8	97.5
Latvia	2.9	0.83	-0.5	40.1
Lithuania	3.7	0.31	0.5	39.7
Luxemburg	2.1	0.54	1.5	23
Malta	1.3	1.28	3.9	50.8
Portugal	1.6	3.05	-3	125.7
Slovakia	1.4	0.92	-1	50.9
Slovenia	1.6	0.96	0	73.6
Greece	1.1	5.98	0.8	178.6
NON-EUROZONE STATES				
Bulgaria	1.2	1.6	0.9	25.4
Czech Republic	2.4	0.98	1.6	34.6
Denmark	1.1	0.48	1	36.4
Croatia	1.3	2.77	0.8	78
United Kingdom	2.7	1.13	-1.9	87.7
Sweden	1.9	0.65	1.3	40.6
Hungary	2.4	2.96	-2	73.6
Poland	1.6	3.42	-1.7	50.6
Romania	1.1	3.96	-2.9	35
CANDIDATE STATE				
Turkey	11.1	11.4	2.4	28.3
INDICATORS				

European Union	1.7	1.31	-1	81. 6
Eurozone	1. 5	1. 09	-0. 9	86. 7
REFERANCE VALUE	2. 1	3. 32	3	60

* Eurostat, HICP-inflation rate, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00118 (accessed on 23.05.2018).

** Eurostat, Maastricht Criteria Bond Yields, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00097&plugin=1(accessed on 23.05.2018).

*** Eurostat, General Government Deficit and Surplus Annual Data, http://ec.europa.eu/eurostat/web/government-finance-statistics/data/database(accessed on 23.05.2018) and The General Directorate of Budget and Finance Control (BÜMKO), http://www.bumko.gov.tr/TR, 155/kamu-kesimi-borclanma-geregi-ve-finansmani.html(accessed on 23.05.2018).

**** Eurostat, General Government Gross Debt, http://ec.europa.eu/eurostat/web/government-finance-statistics/data/database(accessed on 23.05.2018) and The General Directorate of Budget and Finance Control (BÜMKO), http://www.bumko.gov.tr/TR, 7044/temel-ekonomik-buyuklukler-2000-2018.html(accessed on 23.05.2018).

IV.1. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity

The results of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity which are conducted with 2017 data are shown in Table 2.

Table 2: The Results of KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.409
Approximate Chi-Square	28.459
Bartlett's Test of SphericityDegress of Freedom	6
Meaningfulness	0.000

Although the KMO's measure of adequacy – 0.409<0.5 – fails to provide a sufficient evidence for a healthy factor analysis, the Barlett's test statistics proves that a factor analysis could be conducted because the Chi-Square distributed test statistics is 28.459, and the degress of freedom is 6. Accordingly, p-value is almost ignorable like 0.000. This case makes obligatory that the hypothesis of $H_0: R = I$ (the correlation matrix between the observable variables is unit matrix) provided that the type I error is selected as $\alpha = 0.05$ is to be rejected. This casemakes obligatory that the hypothesis of $H_0: R = I$ (the correlation matrix between

the observable variables is unit matrix) provided that the type I error is selected as $\alpha = 0.05$ is to be rejected. And, also shows that it is possible to conduct a factor analysis because there are correlations between observable variables, and the goings-on could be represented by a couple of factors instead of expressing in a great number of observable variables. So, the universe represented by four observable variables can be represented by two factors like in Table 3.

Table 3: The Factor Structure Matrix According to Varimax Rotation

	F_1 Monetary Discipline Divergence	F_2 Fiscal Discipline Divergence
Long-term Interest Rate	0.944	
Inflation Rate	0.882	
Ratio of Government Debt Stock to GDP		-0.871
Ratio of Budget Deficit to GDP		0.776

IV.2. Conceptualizing of The Factors

Conceptualizing the factor F_1: This factor addresses two observable variables related with the monetary space. They are (1) long-term interest rate, and (2) inflation rate. As stated before, EU institutions and organizations were commissioned to maintain the monetary discipline while anticipating a growth without inflation within the frame of targets defined in Founding Treaty. Each of the loads (the correlation of observable variables in question with the factor) about two observable variables related with monetary space are positive numbers, which means each of the observable variable will rise when F_1 rises. So, it is possible to define F_1 as a monetary discipline divergence. The more diverge from monetary discipline, the more inflation and interest rate will rise. When it comes to rank the value of states' monetary discipline divergence, the rank number 1 is the possible highest rank, and the rank number 28 is the possible lowest rank. Because the monetary discipline divergence is considered as such a terrifying condition as clearly indicated in Maastricht Criteria, the rank number 1 should be evaluated as the "worst scenario", while the rank number 28 as the "best scenario".

Conceptualizing the Factor F_2: This factor addresses two observable variables related with the fiscal space. They are (1) the ratio of government debt stock to GDP, and (2) the ratio

of budget deficit to GDP. Although EU institutions and organizations are not entrusted with the authority to determine the fiscal policy within the scope of Founding Treaty, it is suggested to maintain fiscal policy within the framework of the Stability and Growth Pact. The sign of first observable variables related with fiscal space is negative, while the second is positive meaning when F_2rises, one of the observable variables increases and the other decreases. So, it is possible to name F_2 as the fiscal discipline which means that it is not permitted to become arbitrarily indebted for financing the rising budget deficits relying on a certain wealth (GDP) and it is only allowed to undertake a debt load in line with the wealth owned. When it comes to rank the values of states' fiscal positions, the rank number 1 is the highest rank, and the rank number 28 is the lowest rank. Because the fiscal discipline is considered as an important criterion to be met by Maastricht Criteria, the rank number 1 should be evaluated as the "best scenario", while the rank number 28 as the "worst scenario".

IV.3. Findings: The Scores and Rankings of Monetary and Fiscal Discipline Divergence

According to these classifications, the scores and rankings of EU states and Turkey about fiscal discipline and monetary discipline divergence can be calculated as in Table 4:

Table 4: The Scores and Rankings with Respect to 2017 Factors (Except Estonia)

	F_1: Monetary Discipline Divergence	Rank	F_2: Fiscal Discipline	Rank
Germany	-0.489	24	0.610	10
Austria	-0.268	16	-0.201	18
Belgium	-0.167	14	-0.712	22
Finland	-0.688	27	0.026	13
France	-0.435	21	-1.147	24
Netherlands	-0.565	25	0.635	9
Ireland	-0.736	28	-0.047	17
Spain	-0.035	10	-1.321	25
Italy	0.018	9	-1.733	26
Cyprus	-0.074	12	-0.039	16
Latvia	-0.123	13	0.523	11
Lithuania	-0.039	11	0.911	8
Luxemburg	-0.439	22	1.364	2

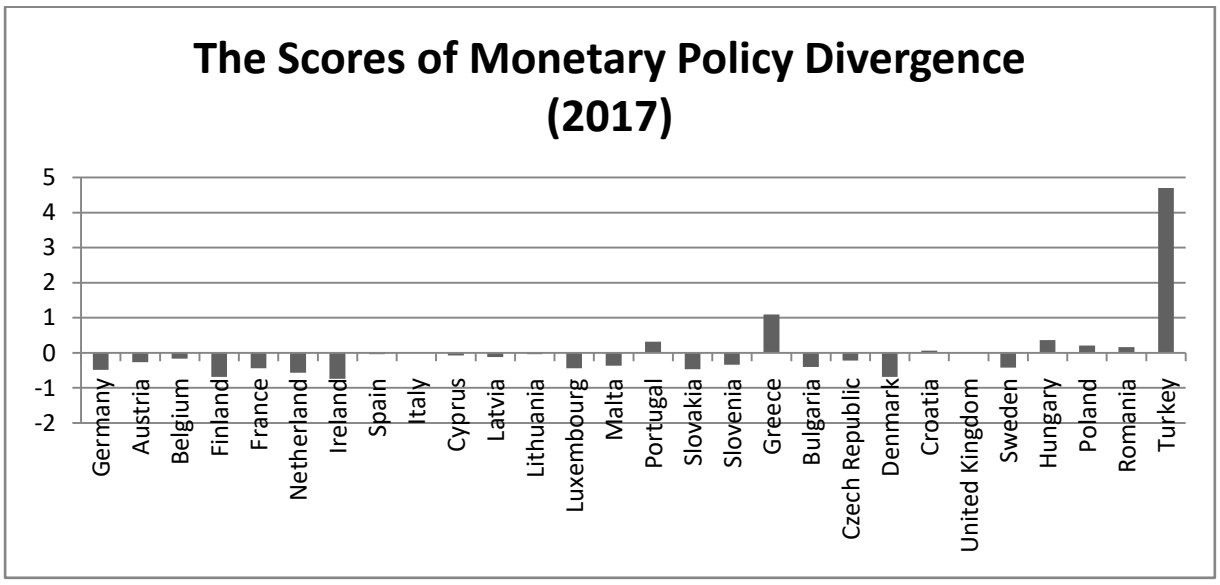
Malta	-0.369	18	1.494	1
Portugal	0.314	4	-1.887	27
Slovakia	-0.468	23	0.095	12
Slovenia	-0.337	17	0.017	15
Greece	1.097	2	-1.915	28
Bulgaria	-0.404	19	1.012	5
Czech Republic	-0.216	15	1.185	4
Denmark	-0.684	26	0.936	7
Croatia	0.061	7	0.022	14
United Kingdom	0.020	8	-0.717	23
Sweden	-0.417	20	0.991	6
Hungary	0.366	3	-0.667	21
Poland	0.212	5	-0.280	19
Romania	0.167	6	-0.441	20
Turkey	4.700	1	1.288	3

Turkey ranks first in the list which means it is the state with worst performance in terms of the monetary discipline divergence as of 2017. Greece (the second) is the only one state approaching nearby Turkey in terms of the factor in question. However, it is possible to view the 2017 data in absolute numbers. According to the data set given in Table 1, the reference value of inflation is 2.1%, while the inflation rate of Turkey reaches to a by far higher level of 11.1%. The strict follower of Turkey, Greece has an inflation rate of only 1.1%. The best performing state (Number 28), Ireland has an inflation rate of as low as 0.3%. No other inflation rate of any state neither located inside the Eurozone (2.2% in Austria, 2.2% in Belgium, 3.7% in Estonia, 2.9% in Latvia, and 3.7% in Lithuania) nor outside (2.4% in Czech Republic, 2.7% in United Kingdom, and 2.4% in Hungary) is comparable to that of Turkey.

On the other hand, the reference value of long-term interest rate is 3.32% among EU member states, while it is 11.4% in Turkey in parallel to its extraordinarily high inflation rate. In Greece, the closest follower of Turkey, the long-term interest rate fluctuates around 5.98%, while Ireland - the best performing state in the ranking – has a long-term interest rate of only 0.8%. Ireland and Greece have been in Eurozone since 1999 and 2001 respectively. The unique Eurozone state which deviates by far from the reference long-term interest value is

Greece. Outside the Eurozone, Poland (3.42%) and Romania (3.96%) slightly deviates from the reference value. However, bearing in mind that these two states are out of the umbrella of EMU and ERM, it goes without saying that the power of making monetary policy is conferred to the EU's exclusive competence.

The scores of monetary disciplines divergence of both Turkey and EU member states are shown in Graph 1.



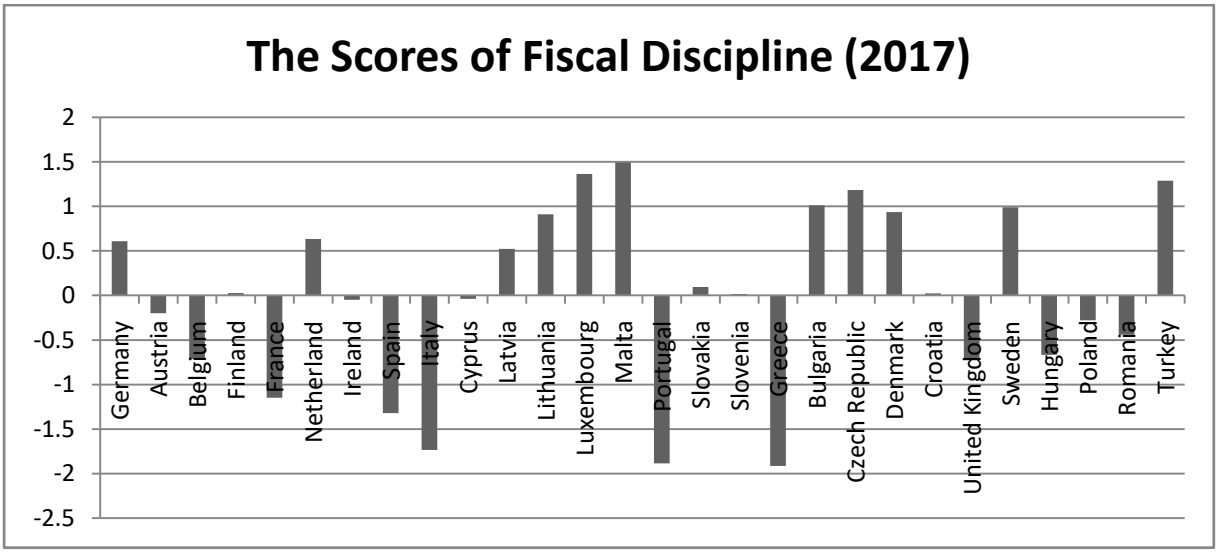
Graph 1: The Scores of Monetary Discipline Divergence

Turkey ranks 3rd in the listing of fiscal discipline which should be regarded as a quite good ranking. In terms of fiscal discipline, Luxemburg ranks 2nd, while Czech Republic 4th. It is possible to look at 2017 data as absolute numbers. According to the data set shown in Table 1, Turkey's ratio of budget deficit to GDP is 2.4% which extremely meets the reference value of 3%. Luxemburg's ratio of budget deficit to GDP is 1.5%, while Czech Republic's is 1.6%. Among the Eurozone states Malta has the greatest deviation from the reference value with the ratio of 3.9%.

On the other hand, Turkey's ratio of public debt to GDP is only 28.3%, while both EU-27 average (81.6%) and Eurozone average (86.7%) are quite higher than the reference value of 60%. It is observed that 12 states (Germany with 64.1%, Austria with 78.4%, Belgium with 103.1%, Finland with 61.4%, France with 97%, Ireland with 68%, Spain with 98.3%, Italy with 131.8%, Cyprus with 97.5%, Portugal with 125.7%, Slovenia with 73.6%,

and Greece with 178.6%) included in Eurozone and 3 states (Croatia with 78%, United Kingdom with 87.7%, Hungary with 73.6%) outside Eurozone strongly deviate from the reference value set for the ratio of public debt to GDP. Clustering around Turkey in the ranking of fiscal discipline, Luxemburg's ratio of public debt to GDP is 23%, while Czech Republic's is 34.6%. However, it is worth to remind that unlike the monetary policy, the power in fiscal policy is left to competence of member states, while the threshold values are distinctly set by the Stability and Growth Pact.

The fiscal discipline scores for Turkey and EU member states are shown in Graph 2.



Graph 2: The Scores of Fiscal Discipline

IV.4. The Findings of Wilcoxon W Statistics Test

In addition to assessing the ranks and scores in line with the objectives of study, it looks like a better approach to view whether the outlook of monetary discipline divergence and fiscal discipline depends on being in Eurozone. In this context, the Wilcoxon W Statistics Test is the most appropriate methodology to be used (Korkmaz, 2000). In the methodology, the variable of Euro is either 1 or 0. If a state is in Eurozone then Euro=1, otherwise Euro=0. The number of states placed in Eurozone is defined as $n_1 = 18$ (except Estonia), while the non-Eurozone states is $n_2 = 10$. Wilcoxon W Statistics Test is expressed as the smaller of the rank totals which is $W = 226$ for monetary discipline divergence, and $W = 238$ for fiscal discipline. The values are listed in Table 5.

Table 5: The Rankings

	Euro	Average Number of Observations	Average Ranking	Rank Totals
Monetary Discipline Divergence	0	10	18.00	180.00
	1	18	12.56	226.00
	Total	28		
Fiscal Discipline	0	10	16.80	168.00
	1	18	13.22	238. 00
	Total	28		

The expected value of Wilcoxon W Statistics Test,

$$E(W) = \frac{n_1(n_1+n_2+1)}{2}$$

,and its variance

$$Var(W) = \frac{n_1 n_2 (n_1 + n_2 + 1)}{12}$$

are calculated as indicated above, and

$$Z = \frac{W - E(W)}{\sqrt{Var(W)}}$$

value can be viewed as the stochastic variable with standard normal distribution, provided that the number of observations is high enough. The critical value of standard normal stochastic variable is $z_{0.05} = 1.65$ for $\alpha = 0.05$. If the Z value calculated above exceeds 1.65 or drops down -1.65 then the necessary statistical evidences are acquired to reject the following arguments:

H_0: "The monetary discipline divergence does not vary by the location – Eurozone or Non-Eurozone – of a state."

or,

H_0: "The fiscal discipline does not vary by the location – Eurozone or Non-Eurozone – of a state."

The SPSS output for that is as in Table 6:

Table 6: Wilcoxon W Statistics Test

	Monetary Discipline Divergence	Fiscal Discipline
n_1	18	18
n_2	10	10
Wilcoxon W	226	238
E(W)	261	261
Var(W)	435	435
Z	-1, 678<-1.65	-1, 103>$-1.z_{0.05}$
The judgement	H_0: The hypothesis claiming that the monetary discipline divergence does not vary by the position of a state is REJECTED.	H_0: The hypothesis claiming that the fiscal discipline does not vary by the position of a state is ACCEPTED.

Accordingly, Eurozone states maintain different attitudes as compared to Non-Eurozone states when it comes to monetary discipline divergence. The states inside the Eurozone are relatively more meticulous about the monetary discipline. Being a part of Eurozone has some facilitative effects on the states for keeping them at the axis of monetary discipline because of the central position of Euro and the conferral of the member states' competence to the EU in monetary policy sphere.

In other respects, it is not possible to verbalize that there is a statistically meaningful difference between the Eurozone states and Non-Eurozone states in terms of fiscal discipline. It would be a right attempt to look for the reason of it in the omission of fiscal policy determined by the Stability and Growth Pact from the exclusive competence area. With a slightly limited cohesiveness, the Stability and Growth Pact has also limited administrating power for maintaining the monetary discipline.

V. Conclusion

In line with the ambitious goal of establishing an ever closer integration among people it united, the EU soared high to materialize the promise of higher standards and quality of life. Transcending bare customs union as defined in 1950s, the EU introduced single currency into the common market upon realization of thresholds as defined in Maastricht Criteria in 1990s. The tremendous welfare improvement, thanks to the economic integration of member states, has led the former founding six states to amalgamate with others to reach 28 in number by

2010s. While at the same time, a customs union was finalized by 1996 between Turkey and the EU with the overarching aim of accelerating the development efforts of Turkey in line with the provisions of Ankara Agreement, and accession talks with Turkey was launched in 2005. The course of negotiations lasting for more than ten years has been shaped by the capacity of Turkey to undertake the EU norms. In this context, it becomes more of an issue for Turkey to periodically asses the distance covered in membership process and offer constructive policy suggestions for the negotiations by updating the findings on the phase of Turkey in adopting the Maastricht Criteria in view particularly of the 17th Chapter on Economic and Monetary Policy of the Negotiations Framework document.

The Maastricht Criteria set five crucial parameters over the threshold values for inflation rate, long-term interest rate, budget deficit, government debt stock, and exchange rate to maintain the economic convergence of member states to each other, while envisaging monetary and fiscal discipline in general. The absolute power of implementing the fiscal policy vests in the competence of member states, while indicative fiscal norms and rules are set by the Stability and Growth Pact. According to impressive findings of Wilcoxon W Statistics Test, the position of a state whether it is in Eurozone or not makes no difference when it comes to fiscal discipline, suggesting that non-Eurozone states might be in a better position in budget deficit and government debt stock. Indeed, the output of factor analysis shows that Turkey ranks 3rd in fiscal discipline which highlights Turkey's outstanding position in the stated two parameters. Based on the finding that, a Eurozone state, Greece is the worst performing member in fiscal discipline with its rank of 28, it is suggested Turkey's zealous efforts for maintaining fiscal discipline as compared to that of the member states should be highly appreciated by the EU.

On the other hand, the power in monetary policy is conferred to the EU's exclusive competence. The norms and rules of monetary policy are applied to all the member states, no matter it is in Eurozone or not, through the authority of European System of Central Banks. Taking part in Eurozone relatively provides some advantage to states against the backdrop of economic convergence. According to the compelling findings of factor analysis, Turkey has the worst performance among all states in terms of monetary discipline divergence, while it is followed by Greece ranking 2nd. Recent high levels of inflation and interest rates observed in Turkey stem from the developments in international politics and trade further points Turkey

into a corner for maintaining the monetary discipline. However, given the truth of tragic monetary discipline divergence of Greece despite being a member of Eurozone – a promised land for economic convergence – it already seems quite reasonable to recommend the EU to show the same tolerance allowed for Greece towards Turkey on equal footings for monetary discipline divergence without discriminating and domestically politicizing it by no means.

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