A COMPARATIVE ANALYSIS BETWEEN WESTERN BALKAN COUNTRIES AND SELECTED OECD COUNTRIES (2010 - 2019) OF THE EFFECT OF UNEMPLOYMENT ON NON-PERFORMING LOAN

BATI BALKAN ÜLKELERİ İLE SEÇİLMİŞ OECD ÜLKELERİ (2010 - 2019) ARASINDA İŞSİZLİĞİN TAHSİLİ GECİKMİŞ KREDİLER ÜZERİNE ETKİSİ

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Abstract

The paper aims to determine and lay out the effect of unemployment on non-performing loans (NPLS) through a comparative analysis between the Western Balkans countries and some selected OECD countries. The size of NPLs plays is key in a country's banking sector stability. Macroeconomic factors that explain the NPLs contain important information for a country and their banks and studies in this regard, which compare developing countries and already developed ones have received little attention. To carry out this study, panel data and quantitative econometric models have been applied, specifically Linear Regression, Random Effect, Fixed Effect, Huasman - Taylor Regression and Generalized Estimating Equations (GEE Model) on secondary data from official reports of the World Bank, Organization for Economic Cooperation and Development, during the period from 2010 to 2019. Based on economic theory and our findings, we can say that the relationship between the unemployment rate and non-performing loans is directly proportional: an increase in the unemployment rate will lead to an increase in the non-performing loan rate. Moreover, Findings show that controlling the rate of unemployment helps in controlling the level of non-performing loans

Keywords: Banking, Non-Performing Loans, Unemployment, Western Balkan Countries, OECD Countries.

Öz

Bu çalışmanın temel amacı, Batı Balkan ülkeleri ve bazı seçilmiş OECD ülkeleri arasında karşılaştırmalı bir analiz yoluyla işsizliğin sorunlu krediler üzerindeki etkisini belirlemektir. Takipteki alacakların (TGA) büyüklüğü, bir ülkenin bankacılık sektörünün istikrarında kilit rol oynamaktadır. Takipteki alacakları açıklayan makroekonomik faktörler, bir ülke için olduğu kadar bankalar için de çok önemli bilgiler içermektedir ve bu konuda gelişmekte olan ülkelerle gelişmiş ülkeleri karşılaştıran çalışmalar az ilgi görmektedir. Bu çalışmayı gerçekleştirmek için Dünya Bankası, Örgütün resmi raporlarından alınan ikincil veriler üzerinde, özellikle Lineer Regresyon, Rassal Etki, Sabit Etki, Huasman - Taylor Regresyon ve Genelleştirilmiş Tahmin Denklemleri (GEE Modeli) olmak üzere panel veriler ve nicel ekonometrik modeller uygulanmıştır. Ekonomik İşbirliği ve Kalkınma için 2010-2019 döneminde. İktisat teorisi ve bulgularımıza dayanarak, işsizlik oranı ile takipteki krediler arasındaki ilişkinin doğru orantılı olduğunu söyleyebiliriz: işsizlik oranındaki bir artış, takipteki kredi oranındaki artışa yol açmaktadır. Ayrıca, bulgular, işsizlik oranının kontrol edilmesinin, takipteki kredilerin seviyesini kontrol etmeye yardımcı olduğunu göstermektedir.

Anahtar Kelimeler: Bankacılık, Donuk Krediler, İşsizlik, Batı Balkan Ülkeleri, OECD Ülkeleri

GENİŞLETİLMİŞ ÖZET

Çalışmanın Amacı

Bu çalışmanın temel amacı, Batı Balkan ülkeleri ve bazı seçilmiş OECD ülkeleri arasında karşılaştırmalı bir analiz yoluyla işsizliğin donuk krediler üzerindeki etkisini belirlemektir. Takipteki alacakların (TGA) büyüklüğü, bir ülkenin bankacılık sektörünün istikrarında önemli rol oynamaktadır. Takipteki alacakları açıklayan makroekonomik faktörler, bir ülke için olduğu kadar bankalar için de çok önemli bilgiler içermektedir ve bu konuda gelişmekte olan ülkelerle gelişmiş ülkeleri karşılaştıran çalışmalar çok az ilgi görmektedir.

Araştırma Soruları

Bildiğimiz kadarıyla batı Balkan ülkelerini OECD ülkeleri ile karşılaştıran çok az sayıda çalışma bulunmaktadır. Bunun nedeni, bu batı Balkan ülkelerinin birçoğunun savaş, siyaset ve ekonomik istikrarsızlık gibi sorunlarla boğuşmuş olmasıdır. Ayrıca, bu ülkelerin çoğu Avrupa Birliği'ne geçiş sürecinde olduğundan ve dünya ekonomisine katacakları çok şey olduğundan, Avrupa Birliği'nin kalkınma sürecine ilişkin bir görüş elde etmek için böyle bir çalışmanın yapılması yerinde olacaktır.

Literatür Araştırması

Mazreku vd. (2018), 2006 ve 2016 yılları arasında 10 geçiş ülkesinin ticari bankalarındaki takipteki alacakların düzeyinin belirleyicilerini inceledi. Geçiş ülkelerindeki ticari bankaların, GSYİH büyümesinin kredi dışı performansla güçlü bir ters ilişkiye sahip olduğunu gösterdiğini buldular. Turan ve Koskija (2014), Arnavutluk'ta takipteki alacakların sürekli büyümesini analiz etmiş ve bunun ekonomik krizin neden olduğu sorunların ve göçmenlerin gelirlerindeki azalmanın bir sonucu olarak ortaya çıktığını tespit etmiştir. 2003 ve 2013 yılları arasında üç aylık verileri ve çok değişkenli bir eş bütünleşme testi kullanıyorlar ve takipteki alacaklar ile reel GSYİH, işsizlik, enflasyon, kredi faiz oranları ve havalelerin ülkenin uzun vadeli planına entegre olduğunu buluyorlar. San (2016), 2007-2014 döneminde Arnavutluk bankacılık sektöründeki takipteki alacaklara ilişkin makroekonomik göstergelere ilişkin sonraki bir çalışmasında, takipteki alacakların işçi dövizleri ve işsizlik oranı ile negatif bir korelasyona sahip olduğunu tespit etmiştir. Ayrıca Fajar ve Umanto (2017), Endonezya Menkul Kıymetler Borsası'nda (IDX) kote 20 Endonezya kamu bankasına ilişkin örnek olay incelemesinde, makroekonomik faktörlerin 2005 ve 2014 yılları arasındaki dönemde sorunlu krediler üzerindeki etkisini vurgulamıştır. GSYİH içinde ve enflasyon seviyesinin takipteki alacaklar üzerinde önemli bir olumsuz etkisi vardır. Saba vd. (2012) tarafından 1985 ve 2010 yılları arasında ABD bankaları üzerinde yürütülen çalışmada, enflasyon ve genel kredilendirmenin takipteki alacaklar üzerinde önemli bir etkiye sahip olduğu tespit edilmiştir ve Zeng (2012) tarafından 1999 ve 2000 yılları arasında Çin'deki TGA'lar üzerinde gerçekleştirilen bir analize dayalı bir model kullanılarak yapılmıştır. Optimal kontrol teorisine göre, Çin bankalarının takipteki alacaklarının denge değerinin, dış dünyaya açık ekonomileri ve hükümet politikalarını içeren makroekonomik anlamda mikro ekonomik faktörlere bağlı olduğu gösterilmiştir.

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Yöntem

Bu çalışma, işsizliğin ulusal takipteki krediler üzerindeki etkisini ele aldığı gerçeğinden hareketle, Arnavutluk, Kosova, Makedonya, Karadağ, Bosna Hersek, Sırbistan ve Hırvatistan başta olmak üzere 7 Batı Balkan ülkesine ait bankacılık verilerine panel veri analizi uygulanmıştır. OECD ülkeleri, özellikle Avusturya, Finlandiya, Japonya, Kanada, Kolombiya, ABD, Meksika, Almanya, Fransa, İtalya, Güney Kore, İspanya, Avustralya, Şili, Belçika, Çek Cumhuriyeti, Macaristan, İsviçre, İrlanda, Estonya ve Lüksemburg'a ait ikincil veriler kullanılmıştır. Her ülkenin verisi Dünya Bankası yıllık raporlarından alınmıştır. Başlangıçta, ekonometrik modelde TGA'lar bağımlı değişken olarak alınırken, işsizlik, enflasyon, kişi başına düşen GSYİH, reel faiz oranı ve doğrudan yabancı yatırımlar bağımsız değişken olarak alınmıştır. Veri işleme için Microsoft Excel uygulaması ve STATA ekonometri programı kullanılmıştır. Veriler ekonometrik testler, özellikle Çoklu Doğrusal Regresyon, Sabit Etki, Rastgele Etki, Hausman - Taylor Regresyonu, Genelleştirilmiş Tahmin Denklemleri (GEE Modeli) ve ayrıca doğrusal eğilim analizi uygulayarak analiz edilmiştir.

Sonuç ve Değerlendirme

Bağımsız değişken olarak kişi başına düşen GSYİH'nın, incelenen dönem için seçilmiş OECD ülkelerinin Takipteki alacakları azaltmada olumlu bir etkisi olduğu görülmektedir. Kişilerin harcanabilir geliri daha fazla olduğu için kredi geri ödeme yükümlülüklerini yerine getirmeleri daha kolaydır. Ancak test sonuçları bu iki değişken arasında negatif bir ilişki olduğunu göstermektedir, hem Batı Balkan ülkeleri hem de OECD için yapılan testler anlamlı bulunmamıştır. Ekonometrik modellerin sonuçları, RIR ve NPL'ler arasındaki ilişkinin istatistiksel olarak anlamlı olduğunu ve batı Balkan ülkelerindeki büyüme üzerinde etkisi olduğunu göstermektedir. Ancak bu ilişki, seçilmiş OECD ülkeleri için istatistiksel olarak anlamlı değildir. Seçilmiş OECD ve batı Balkan ülkelerinde, DYY'nin takipteki alacaklarla negatif bir ilişkisi vardır. Yani doğrudan yabancı yatırımlardaki artış, takipteki alacaklarda bir azalmaya neden olmaktadır. Bulgular, makroekonomik koşulların öneminin altını çizdiği için geçiş ekonomilerinde bankacılık sektörünün istikrarı ve sağlığı için önemli çıkarımlara sahiptir. Sonuç, özellikle bu ülkelerde kalkınmayı destekleyen makroekonomik politikalara, özellikle de büyümeyi ve istihdamı artırmak için yerli ve yabancı yatırımları çekmenin gerekli olduğunu göstermektedir.

1. INTRODUCTION

Although employment can be easily defined by the fact, that one is employed if and only if s/he has a job. Employment refers to persons who currently form part of the full-time or part-time labour force. However, unemployment is a more subtle concept. Just because a person does not work does not mean that s/he is considered unemployed. According to Krugman and Wells (2018), the U.S. Census Bureau, which is a federal agency, is tasked with collecting unemployment data, considers the unemployed to be those who are "unemployed, looking for jobs, and available for work." Retired people are not considered because they are not looking for work; others may not be considered because they are not available for work or unable to work for whatever reason. More specifically, an individual is considered unemployed if they currently do not have a job and have actively sought a job in the last four weeks. So unemployment is on the other hand defined as the number of persons who are actively searching for work but are not currently employed (Krugman and Wells, 2018). Unemployment has serious consequences for the society of a country as well as for its economy and a state with a low unemployment rate is considered to be socially and economically stable.

Studies such as those by Mazreku et al. (2018), Turan and Koskija, (2014), San (2016), Fajar and Umanto, (2017), Kjosevskia et al. (2019), Klein (2013), Clichici and Colesnicova (2014), Saba et al. (2012), Zeng, (2012) and Karim and Anjom (2016) have concluded that there is a positive link between unemployment and bad loans; noting that with rising unemployment, the rate of non-performing loans (NPLs) increases.

According to Bloem and Freeman (2005), the International Monetary Fund (IMF) sets multiple criteria for the classification of NPLs. Segal (2021) notes that the IMF has designated loans as non-performing if interest and /or principal payments have not been paid for at least 90 days or more. Specifically, interest payments equal to 90 days or more are capitalized, refinanced or delayed by agreement, as well as payments are delayed by less than 90 days, but they come with uncertainty or without any assurance that payments will be made in the future.

As far as we are aware only a few studies have compared the Western Balkans countries to OECD countries. Perhaps this is since many of these Western Balkan countries have been plagued by problems such as war, politics and economic instability. Also, since most of these countries are in transition to become part of the European Union or have already joined and they have a lot to contribute to the world economy, it is pertinent to carry out such a study to obtain a view on the development progress of these countries vis-à-vis other already so defined developed countries.

The main objective of this study is to know how unemployment has affected NPLs by taking a comparative analysis between Western Balkan countries, specifically Albania, Kosovo, Macedonia, Montenegro, Bosnia and Herzegovina, Serbia and Croatia and selected OECD countries, specifically,

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Austria, Finland, Japan, Canada, Colombia, USA, Mexico, Germany, France, Italy, South Korea, Spain, Australia, Chile, Belgium, Czech Republic, Hungary, Switzerland, Ireland, Estonia and Luxembourg, during the period between 2010 and 2019. The countries were chosen based on the completeness of the data availability.

2. LITERATURE REVIEW

Mazreku et al. (2018) studied the determinants of the level of NPLs in commercial banks of 10 transition countries between 2006 and 2016. They found that commercial banks in transition countries show that GDP growth has a strong inverse relationship with non-credit performance. This means that when there is a growth in GDP, people have more disposable income and can meet their loan repayment obligations. Moreover, they also show that inflation is significantly negatively correlated with NPLs, noting that at times when inflation is low, people can meet their credit liabilities because of the decline in the real burden of these repayments as overall prices rise and that Unemployment shows a significant positive relationship with NPLs. The latter underlines further the importance of domestic economic conditions for NPLs.

Turan and Koskija (2014) analysed the continuous growth of NPLs in Albania and found that this resulted as a consequence of the complications caused by the economic crisis and the reduction of emigrants' incomes. They use quarterly data between 2003 and 2013 and a multi-variable co-integration test and find that NPLs and real GDP, unemployment, inflation, loan interest rates and remittances are integrated in the long-term plan of the country. San (2016) in a subsequent study carried out on macroeconomic indicators on NPLs in the Albanian banking sector during the period between 2007 and 2014, finds that NPLs have a negative correlation with remittances and the unemployment rate. Furthermore, Fajar and Umanto (2017) in their case study on 20 Indonesian public banks listed on the Indonesia Stock Exchange (IDX), have highlighted the impact of macroeconomic factors on problem loans during the period between 2005 and 2014. They show that the change in GDP and the level of inflation have a significant negative impact on NPLs.

An analysis carried out by Kjosevskia et al. (2019) of macroeconomic determinants of banks on NPLs to enterprises and households in the Republic of Macedonia, for the entire banking sector for the period 2003-Quarter 4 to 2014 Quarter 4, showed that GDP growth has a negative impact, while unemployment has a positive impact on the growth of NPLs. Furthermore, when relating to enterprises, the findings show that the exchange rate has a positive and statistically significant impact on the level of these NPLs, while inflation has a negative and statistically significant impact on the growth of NPLs for households.

A further study by Klein (2013), who carried out the study of the impact of macroeconomic determinants of banks on NPLs and on the macroeconomic performance of the countries of Central,

Eastern and South-Eastern Europe (CESEE), for the period between 1998 and 2011, using a time series analysis, showed that NPLs reacted to macroeconomic conditions, such as GDP growth, unemployment, and inflation, and points out that high rates of NPLs in these countries negatively affect economic recovery.

Using multivariate linear regression analysis, Clichici and Colesnicova (2014) concluded that NPLs in the Republic of Moldova is influenced by the distinct structures of the banking sector, their policy choices and also the macroeconomic environment. They record an increase in NPLs when unemployment rises and when GDP, exports and remittances decline. However, they find between NPLs and private debt there was no correlation.

A study by Saba et al. (2012) carried out between 1985 and 2010 on US banks, inflation and overall lending was determined as having a significant impact on NPLs and an analysis carried out by Zeng (2012), on NPLs in China between 1999 and 2000 using a model based on optimal control theory, it was shown that the equilibrium value of Chinese banks' NPLs depends on microeconomic factors (e.g., internal management) in macroeconomic terms which include open economies to the outside world and government policies.

The profitability and stability of the bank can be ensured only through an appropriate flow of interest income generated through the intermediation function of lending of banks. However, as banks are now no longer able to generate enough interest income through the classical secured lending and are subject to a requirement to hold their capital provisions as a buffer for eventual loan losses, the bank's capital decreases along with their strength, making them fragile, increasing the trend of NPLs. Therefore, banks are required to take proactive actions to address the phenomenon of poor choice of borrowers by identifying and determining the macroeconomic factors that contribute to the growth of the classical credit in the banking system (Karim ve Anjom 2016).

3. RESEARCH METHODOLOGY AND ECONOMETRIC MODEL SPECIFICATION

Because this study deals with the effect of unemployment on national NPLs, panel data analysis was applied to a sample of Banks from 7 Western Balkan countries, specifically Albania, Kosovo, Macedonia, Montenegro, Bosnia and Herzegovina, Serbia and Croatia and 21 OECD countries, specifically, Austria, Finland, Japan, Canada, Colombia, USA, Mexico, Germany, France, Italy, South Korea, Spain, Australia, Chile, Belgium, Czech Republic, Hungary, Switzerland, Ireland, Estonia and Luxembourg for a period between 2010 and 2019. The data used in the research are secondary and were taken from the annual reports of the World Bank, which are based on the financial reports of the Central Banks of each country. Initially, in the econometric model NPLs were taken as a dependent variable, while unemployment, inflation, GDP per capita, real interest rate, foreign direct investments and personal remittances were taken as independent variables.

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For data processing, we used the Microsoft Excel application and for Statistics and Data Science analysis we used (STATA). We analysed our data by applying econometric tests, specifically, Multiple Linear Regression, Fixed Effect, Random Effect, Hausman - Taylor Regression, Generalized Estimating Equations (GEE Model) as well as linear trend analysis.

Our main hypotheses are as follows:

Ha_0: Unemployment, inflation, gross domestic product, real interest rate, foreign direct investment and remittances do not affect the NPLs of the Western Balkan countries.

Ha_1: Unemployment, inflation, gross domestic product, real interest rate, foreign direct investment and remittances affect the NPLs of the Western Balkan countries.

And:

Hb_0: Unemployment, inflation, gross domestic product, real interest rates, foreign direct investment and remittances do not affect the NPLs of selected OECD countries.

Hb_1: Unemployment, inflation, gross domestic product, real interest rates, foreign direct investment and remittances affect the NPLs of selected OECD countries.

To prove the validity of the hypothesis of this study, we have constructed the following econometric model:

$$NPL_{it} = \beta_0 + \beta_1 UEMP_{it} + \beta_2 INFL_{it} + \beta_3 GDP \ per \ cap._{it} + \beta_4 RIR_{it} + \beta_5 FDI_{it} + \beta_6 PREM_{it} + \gamma_{it}$$

Where:

NPL – NPLs

UEMP – Unemployment

INFL – Inflation

GDP per cap. – Gross Domestic Product per capita

RIR – Real Interest Rate

FDI – Foreign Direct Investment

PREM – Personal Remittances Received

γ *– stochastic variables (other factors not taken into account in the model)*

i – code and t – time period.

Dependent variable:

Non-performing loan - A non-performing loan is a loan in which the borrower is in arrears because s/he has not made the planned payments for a certain period. That is, no payments of either the principal or the interest over a period which usually depends on the relative industry and the type of loan and varies between a period of 90 days or 180 days (Drury, 2020).

Independent variables:

Unemployment - It is one of the most serious macroeconomic diseases. Often, rising unemployment rates are considered a symptom of an economic recession phase. Unemployment represents the percentage of the unemployed out of the total workforce capacity in a given territory within a country or in the whole country. Therefore, this economic indicator shows the level of the unused labour force in economic processes in a geographical territory (Manqellari et al. 2007).

Inflation - Represents the increase of the general price level. Inflation is the decline in the value of money (Mustafa and Ali, 2013).

GDP - This relates to the market value of all the goods and services which a country produces during a given period (Mankiw and Mark, 2013).

Real Interest Rate - This is an interest rate adjusted for inflation to reflect the real cost of funds or yield to the borrower or the investor respectively.

"Real interest rate = Nominal interest rate – Inflation" (expected or current) (Silver et al., 2019).

Foreign Direct Investment - (FDI) Is the investment a firm or individual of a country makes in a business located in another country. Generally, these investments take place when an investor establishes foreign business operations or buys foreign business assets in a foreign company (Scott, 2020).

Remittances - are monies sent or transferred to a third party (Anderson, 2020).

4. COMPARATIVE ANALYSIS OF LINEAR TRENDS

Table 1 and 2 shows the average data on the trends of the respective factors included in this study. Table 1 shows the average data of the selected Western Balkan countries and Table 2 shows the average data for the selected OECD countries. In those tables are integrated the average values of all variables which were used in this study. Through these data, linear trends are presented and comparative analyses between dependent variables and other independent variables are performed.

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Table1. Econometric Model Variables Included in Linear Trends (Selected Western Balkan Countries)

| Years	NPL (Y)	UEMP (X1)	INFL (X2)	GDP per capita (X3)	RIR (X4)	FDI (X5)	PREM (X6)
2010	12.75	23.7	2.63	2.04	7.15	-769084715.75	1656559549.37
2011	13.34	23.9	5.03	2.41	6.84	-1256287720.90	1693848730.89
2012	14.74	23.3	3.54	-0.21	7.89	-670890982.97	1518651990.81
2013	16.50	23.0	2.64	2.52	7.15	-763183419.11	1607051552.52
2014	16.16	23.3	0.29	1.51	6.60	-727725448.78	1667647974.21
2015	14.60	22.2	0.36	3.63	5.94	-666682183.48	1509711006.33
2016	11.96	19.7	-0.08	3.78	5.21	-943666186.96	1563902853.36
2017	9.66	18.3	1.75	3.52	3.93	-940449161.78	1727126251.10
2018	7.28	16.8	1.72	4.16	3.29	-1110563426.71	1985608716.62
2019	5.74	15.5	1.21	3.69	3.02	-1065015500.00	1983951650.20

Source: Data processing by authors (2021)

Table 2. Econometric Model Variables Included in Linear Trends (Selected OECD Countries)

Years	NPL (Y)	UEMP (X1)	INFL (X2)	GDP per capita (X3)	RIR (X4)	FDI (X5)	PREM (X6)
2010	3.87	8.6	1.85	2.48	3.80	10366601249.17	5607178479.30
2011	4.21	8.1	2.89	2.12	3.05	11727279508.71	5710125605.21
2012	4.83	8.2	2.47	0.40	3.63	7762910030.21	5707955084.77
2013	5.28	8.2	1.51	0.77	3.85	1476426164.21	6078143655.23
2014	4.75	7.9	1.29	1.78	3.34	16460093224.62	6372356445.07
2015	4.04	7.4	0.78	2.67	3.02	4408290668.16	6131854712.32
2016	3.60	7.0	1.13	1.52	3.39	-1045414812.44	6296288381.74
2017	3.05	6.4	2.01	2.23	1.50	14289993148.46	6692780901.37
2018	2.51	5.9	2.03	2.13	2.17	-2516414749.28	7210342559.82
2019	2.06	5.7	1.68	1.38	2.22	215837050.17	7369387989.74

Source: Data processing by authors (2021)

Figure 1. The Average Linear Trend Between NPLs and Unemployment of Western Balkan Countries (2010 – 2019)
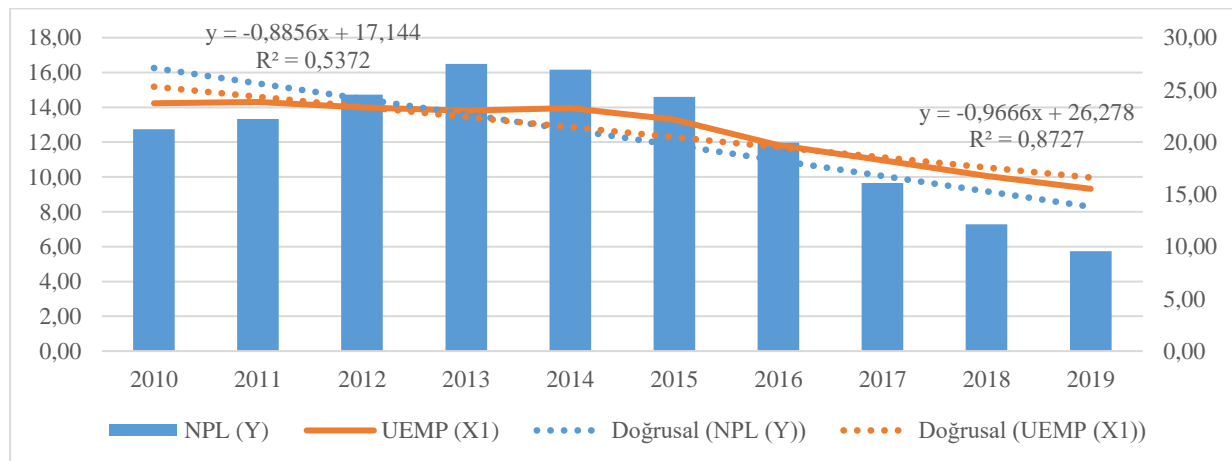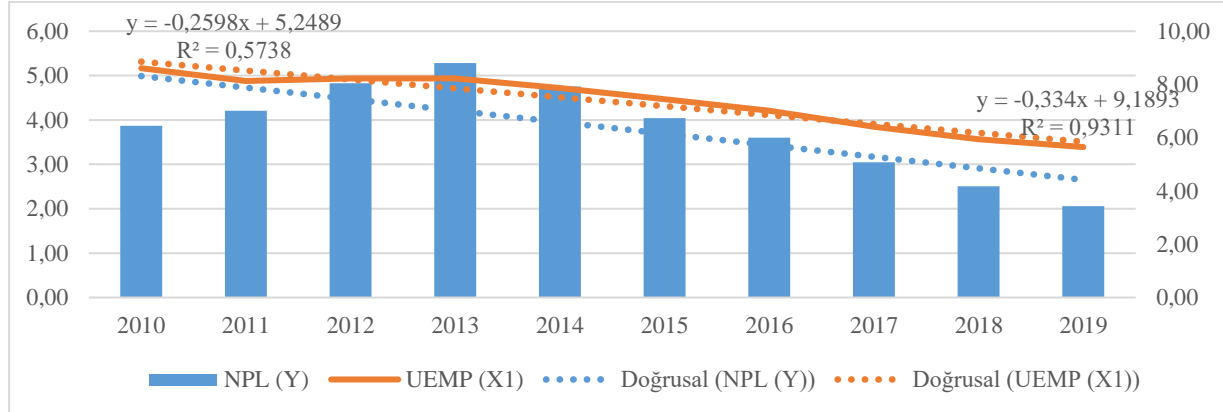

Source: Authors' Data Calculation in Microsoft Excel (2021)

From the data presented in the figure above (fig.1), we can conclude that there is a downward linear average trend for the variable "NPLs" for the period analysed 2010-2019. The average value of the common linear trend for both variables (NPL and UEMP) is also declining, which means that for

the period analysed in the Western Balkans we have a decline in unemployment and this has had a positive impact on NPLs, resulting in a decline in NPLs.
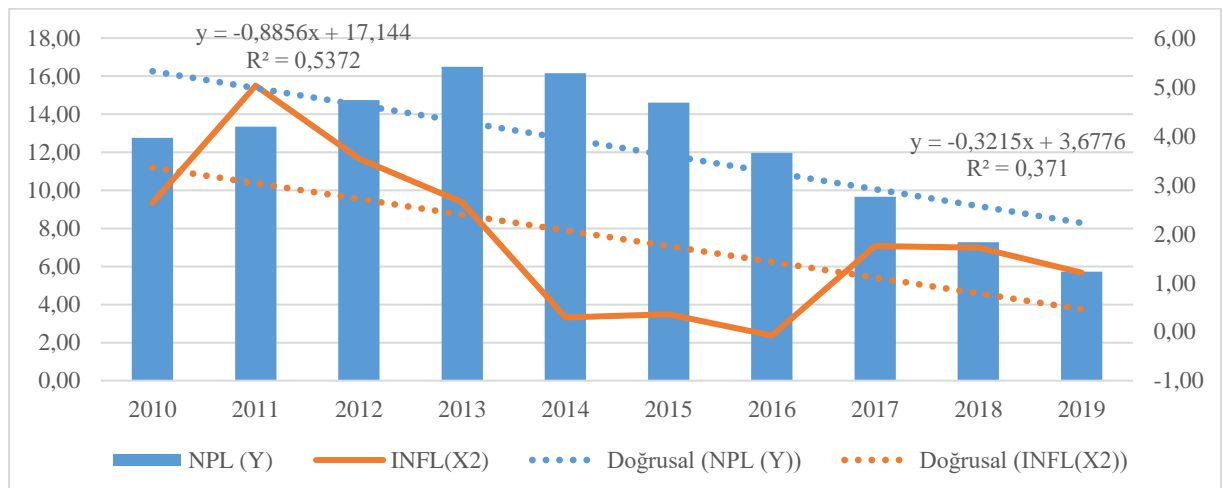
Figure 2. Average Linear Trend Between NPLs and Unemployment of Selected OECD Countries (2010 – 2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

For the analysed period 2010-2019, based on the data presented in figure 2 above, we can conclude that we have an average linear downward trend for the variables "NPLs" and "unemployment" in the selected OECD countries. The average value of the linear trend for both variables has decreased during the analysed period, excluding 2013, where these two variables have increased. However, for the period analysed, the downward linear trend of unemployment has had a positive impact on NPLs of selected OECD countries.

Figure 3. The Average Linear Trend Between NPLS and Inflation of Western Balkan Countries (2010 – 2019)
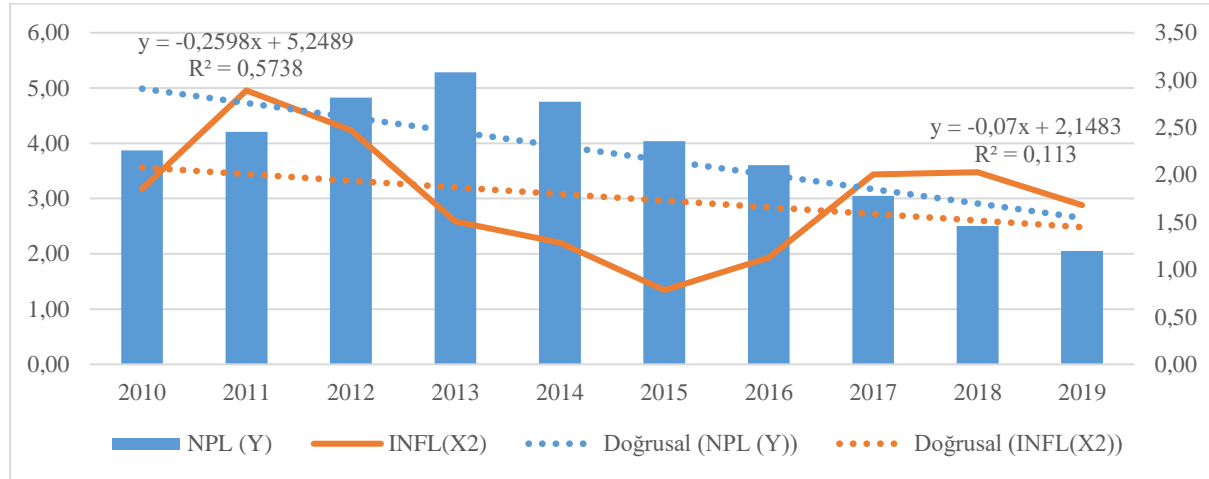

Source: Authors' Data Calculation in Microsoft Excel (2021)

Based on the statistical data presented in figure 3 above we notice an average downward trend for the variables NPL and INFL for the analysed period (2010 - 2019). The average value of the linear

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trend for both variables has a downward slope. It is worth noting that inflation has been volatile, where from 2011 it has decreased and then in 2017 it has increased more sharply. The downward linear inflation trend has had a positive impact on the NPLs of the Western Balkan countries.
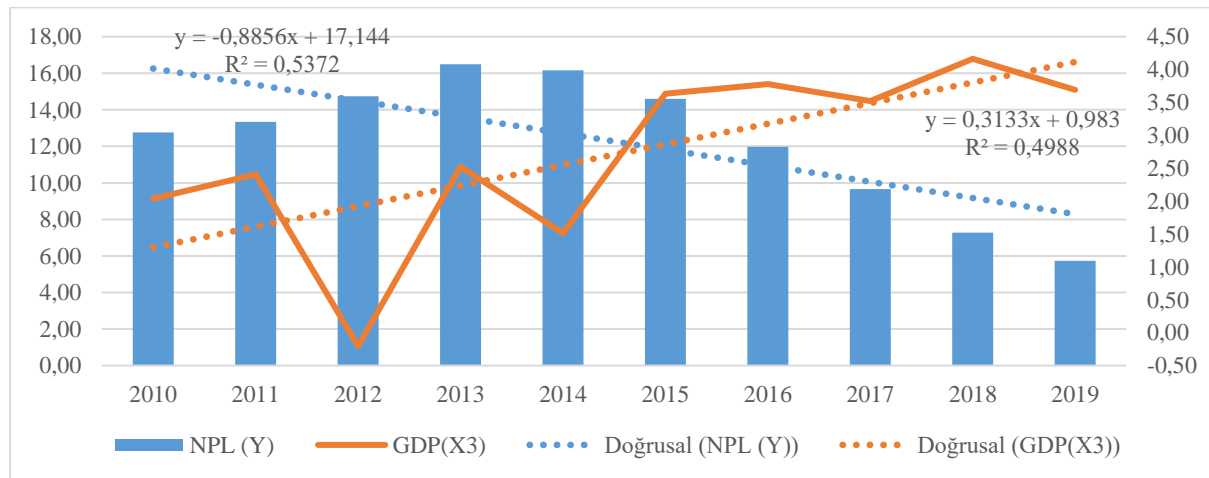
Figure 4. An Average Linear Trend Between NPLs and Inflation of Selected OECD Countries (2010 - 2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Referring to the data presented in figure 4, we can conclude that there was a downward linear average trend for the variable "inflation" in the period analysed - 2010-2019. The average value of the common linear trend for both variables (LEB and POP) is also declining, which means that for the period analysed in the selected OECD countries there is a decrease in inflation and this has had a positive impact on NPLs. However, even in these selected OECD countries, such as those in the Balkans, inflation has experienced volatility with a decrease since 2011 and then a significant increase since 2015.

Figure 5. An Average Linear Trend Between NPLs and GDP Per Capita of Western Balkan Countries (2010-2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Based on the statistical data presented in figure 5, we notice an average downward trend for the variable "NPLs", while for the variable "Gross Domestic Product per capita" we see an average upward trend for the period analysed (2010 - 2019). Numerous fluctuations in GDP are observed, with a very significant decline seen in 2012. It is worth noting that for the analysed period, the linear upward trend of the gross domestic product has had a positive impact on NPLs in the Western Balkans.
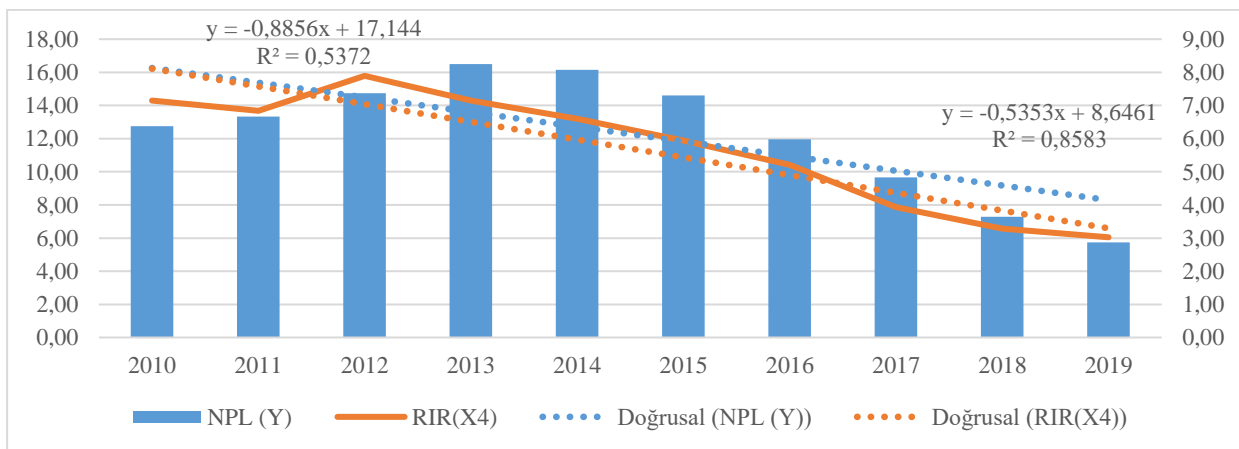
Figure 6. An Average Linear Trend Between NPLs and GDP Per Capita of Selected OECD Countries (2010 - 2019)
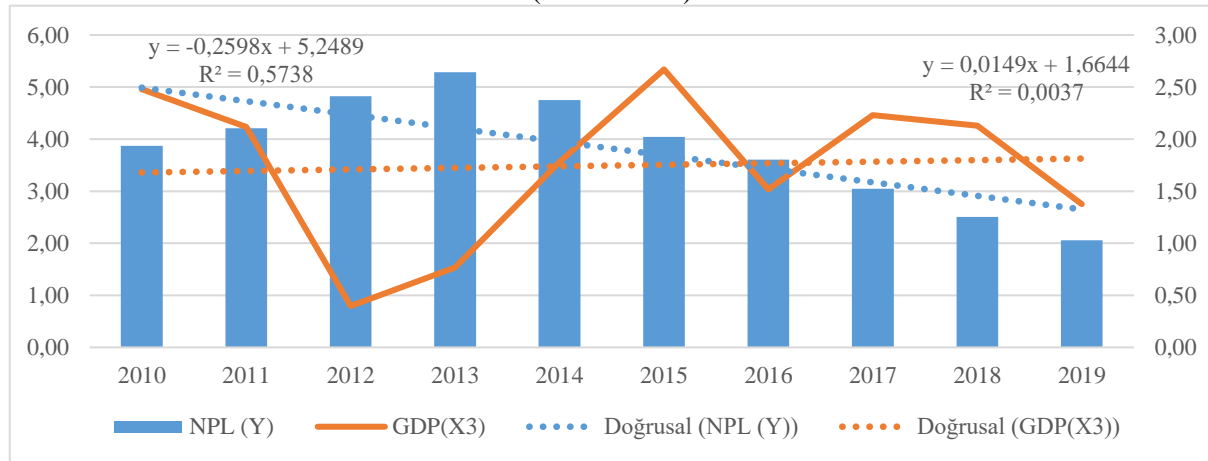
Source: Authors' Data Calculation in Microsoft Excel (2021)

In figure 6, for the selected OECD countries, we see an average downward trend for the variable "NPLs", while for the variable "Gross Domestic Product per capita" we notice an average upward trend for the period analysed (2010 - 2019). This is a similar trend to that noted in the countries of the Western Balkans. Selected OECD countries also show large fluctuations in GDP, where a very significant decline is seen in 2012. However, on the other hand, for the analysed period, the linear upward trend of the gross domestic product has had a positive impact on non -performing loans of the Western Balkan countries.
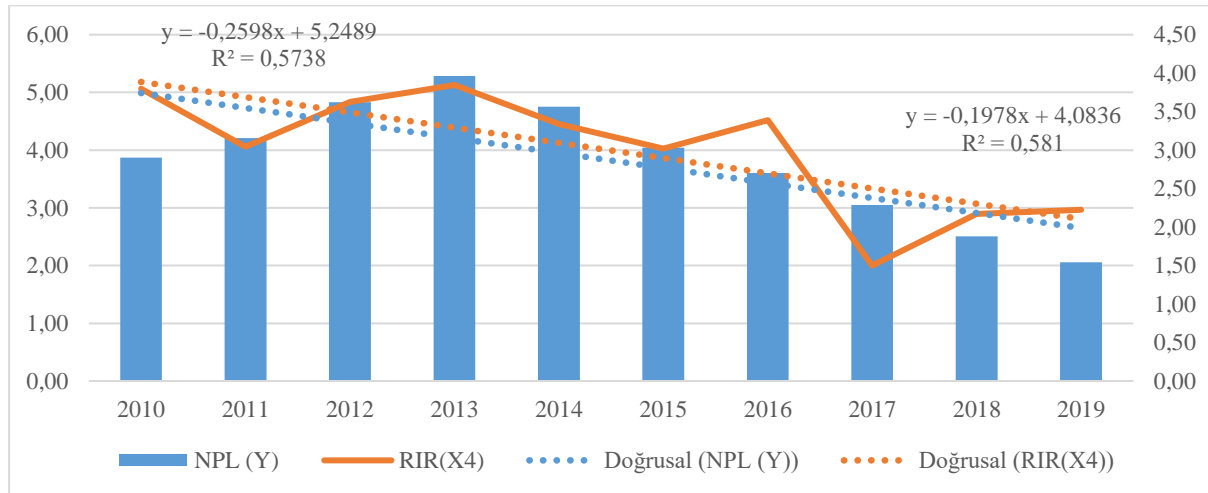
Figure 7. An Average Linear Trend Between NPLs and The Real Interest Rate of Western Balkan Countries (2010-2019*)*

Source: Authors' Data Calculation in Microsoft Excel (2021)

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For the analysed period 2010-2019, based on the data presented in figure 7, we can conclude that there is an average linear downward trend for the variables "NPLs" and "real interest rate" in Western Balkan countries. The average value of the linear trend for both variables decreases in the analysed period. In 2012, we notice that the real interest rate has increased and then steadily decreased. For the analysed period, the downward linear trend of the real interest rate has positively affected the NPLs of the Western Balkan countries.
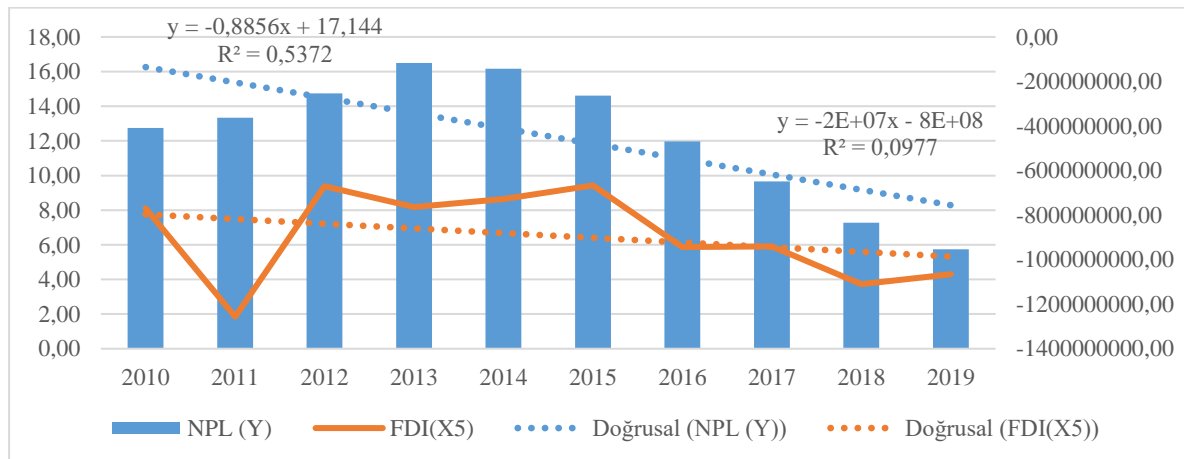
Figure 8. An Average Linear Trend Between NPLs and The Real Interest Rate of Selected OECD Countries (2010-2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Referring to the data presented in figure 8, we can conclude that for the selected OECD countries there is an average linear trend with a downward slope for both variables for the analysed period. The average value of the common linear trend for both variables (NPL and RIR) is with a downward slope, which means that, although for the period analysed in the selected OECD countries we note fluctuations in the real interest rate, it has a positive impact on NPLs.
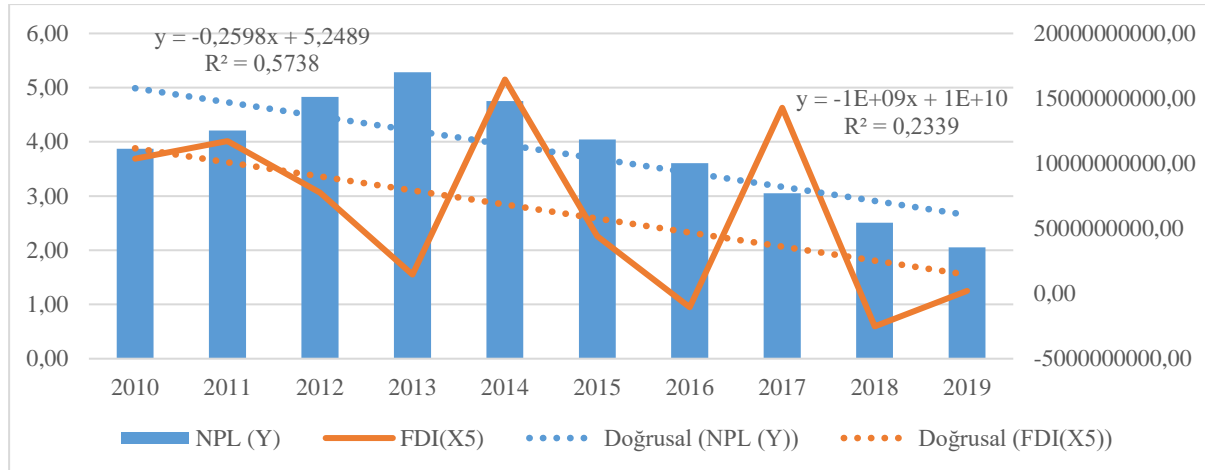
Figure 9. An Average Linear Trend Between NPLS And Foreign Direct Investment of Western Balkan Countries (2010 - 2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Based on the statistical data presented in figure 9, we notice an average downward trend for both variables in the analysed period (2010 - 2019). Fluctuations in foreign direct investment are observed and a very significant decline is seen in 2011. For the period under review, the downward linear trend of foreign direct investment has had a positive impact on NPLs in the Western Balkans.
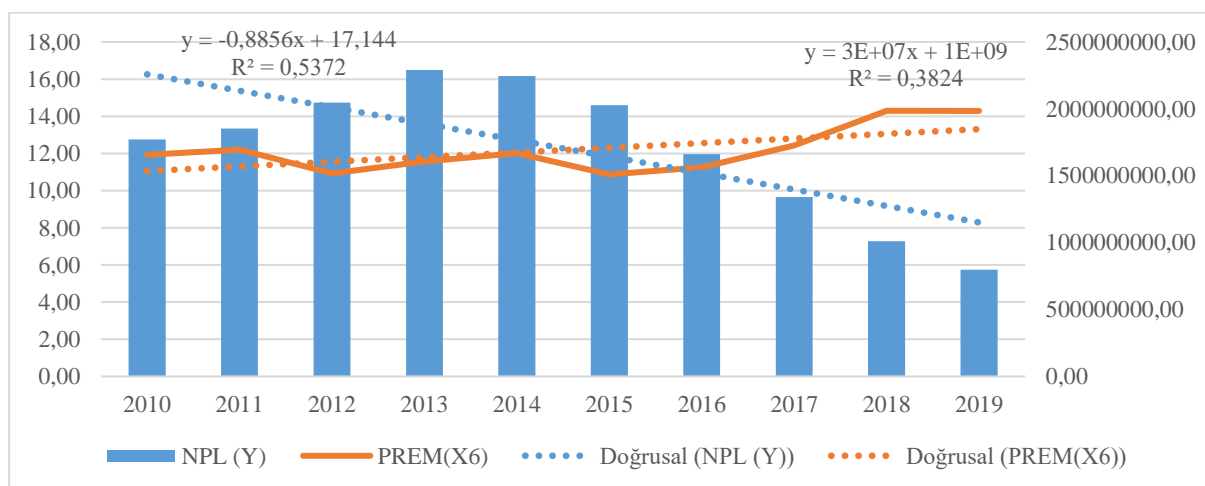
Figure 10. An Average Linear Trend Between NPLS and Foreign Direct Investment of Selected OECD Countries (2010-2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Referring to figure 10, for the selected OECD countries, during the period analysed 2010-2019, we can see an average linear trend with a downward slope for both variables. We note that in these countries that foreign direct investment is very volatile, with significant growth in 2014 and 2017 and a significant decline in 2016 and 2018. In general, we see that the trend of the FDI variable is downward and this has had a positive impact on the decline of NPLs.

Figure 11. An Average Linear Trend Between NPLS and Personal Remittances Received of Western Balkan Countries (2010 – 2019)
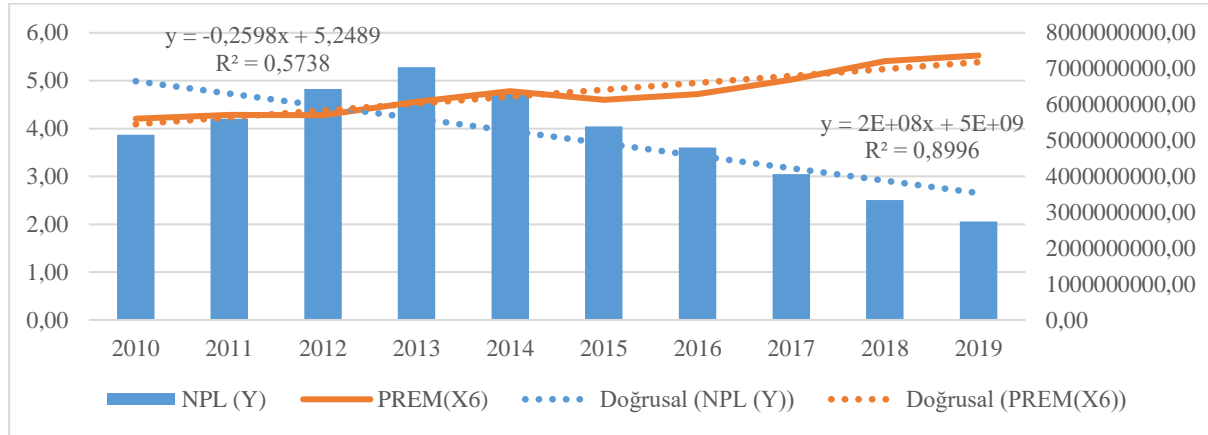

Source: Authors' Data Calculation in Microsoft Excel (2021)

In the Western Balkan countries from the above figure 11, we see a downward trend for the variable "NPLs", while an upward trend for the variable "personal remittances received" for the period

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analysed 2010-2019. This increase in the PREM variable has had a positive impact on the NPL variable, as it has affected its decline. A more pronounced increase is seen in 2018 compared to other years of the analysed period.

Figure 12. An Average Linear Trend Between NPLS and Personal Remittances Received of Selected OECD Countries (2010 – 2019)

Source: Authors' Data Calculation in Microsoft Excel (2021)

Based on the statistical data presented in figure 12, we notice an average downward trend for the variable "NPLs", while for the variable "personal remittances received" we have an average upward trend for the period analysed (2010 - 2019) in selected OECD countries. It is worth noting that for the analysed period, the linear upward trend of personal remittances received has had a positive impact on NPLs, affecting their decline.

5. ECONOMETRIC ANALYSIS AND STUDY FINDINGS

In the following, the data for the dependent and non-dependent variables of the multifactorial models included in this study are analysed, and the comparisons between these models are observed through econometric models.

5.1.Econometric Model's Results of The Western Balkan Countries:

Table 3 summarizes all descriptive statistics for all variables included in the econometric model of Western Balkan countries.

Table 3. Descriptive Statistics For The Variables Included In The Econometric Model of Western Balkan Countries

Variables	Obs.	Mean	Std. Deviation	Minimum	Maximum
NPL	68	12.45574	5.607824	1.9	23.49
UEMP	68	21.20485	7.446477	6.93	42.1
INFL	68	1.909559	2.2182	-1.58	11.14
GDP per capita	68	2.640147	1.749302	-2.81	5.53
RIR	68	5.927936	2.588062	0	10.24
FDI	68	-8.04e+08	7.32e+08	-4.62e+09	-1.64e+08
PREM	68	1.61e+09	1.17e+09	2.91e+08	4.12e+09

Source: Authors' calculations in the STATA program (2021)

Table 4 shows the Pearson correlation coefficient values between NPL and other independent variables (UEMP, INFL, GDP per cap., RIR, FDI, PREM) in the Western Balkan countries' econometric model:

Table 4. Correlation Analysis for The Variables Included In The Econometric Model

Variables	NPL	UEMP	INFL	GDP per capita	RIR	FDI	PREM
NPL	1.0000						
UEMP	-0.4322	1.0000					
INFL	0.2135	0.0940	1.0000				
GDP per cap.	-0.3465	0.1028	-0.2529	1.0000			
RIR	0.2330	0.0960	-0.0697	-0.3321	1.0000		
FDI	-0.5109	0.3893	-0.5314	0.1930	0.1090	1.0000	
PREM	0.4399	-0.1996	0.3542	-0.2251	-0.2225	-0.6504	1.000

Source: Authors' calculations in the STATA program (2021)

According to the data presented in the table above (Table 4), we notice that all the variables incorporated in the econometric model are correlated with each other. We first analyse the correlation between the dependent variable NPL (NPLs) and the independent variable UEMP (unemployment). Results show that NPL has a weak negative correlation with UEMP (R = -0.4322), which means that with rising unemployment NPLs in the Western Balkan countries will decrease. The value of the Pearson ratio between NPLs and inflation (INFL) is very weak (R = 0.2135), and this means that inflation has an impact on increasing the value of NPLs. Even the correlation between NPLs and gross domestic product (GDP) is weak (R = -0.3465), indicating a negative linear relationship between these two variables. Therefore, an increase in GDP in the Western Balkans countries will result in a decrease in the value of NPLs.

NPLs (NPL) and real interest rate (RIR) show a weak positive linear relationship (R = 0.2330). Therefore, with the increase of the real interest rate, we will have an increase in the value of NPLs. Between NPLs (NPL) and foreign direct investment (FDI), there is a negative average linear relationship (R = -0.5109). Similarly, with the increase of FDI, we will have a decrease in the value of NPLs. The linear relationship between NPLs and personal remittances received (PREM) is a weak positive

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relationship (R = 0.4399), which means that with the increase of remittances we will have an increase in the value of NPLs.

As noted above, to test the hypotheses of this study we applied five statistical tests using the Stata application. Specifically, linear regression, random effect, fixed effect, Hausman - Taylor Regression and Generalized Estimating Equations (GEE Model).

The following are the econometric results for the hypothesis of this study for Western Balkan countries:

Table 5. Econometric Results and Empirical Findings of The Study For The Western Balkan Countries

Variables	Linear Regression	Random Effects – GLS Regression	Fixed – Effects Regression	Hausman – Taylor Regression	GEE Model
NPL	-	-	-	-	-
UNEMP	-0.2608841*** (0.007)	-0.2608841*** (0.005)	0.3191606** (0.019)	0.2521424** (0.042)	0.2536971 ** (0.019)
INFL	0.0907341 (0.777)	0.0907341 (0.776)	-0.5800923** (0.012)	-0.55344969** (0.012)	-0.5495469*** (0.005)
GDPcap.	-0.3088363 (0.395)	-0.3088363 (0.391)	-0.243907 (0.362)	-0.2783786 (0.277)	-0.2864146 (0.202)
RIR	0.7063033*** (0.005)	0.7063033*** (0.004)	0.8130143*** (0.001)	0.8723242*** (0.000)	0.8643019*** (0.000)
FDI	-1.63E-9 (0.224)	-1.63E-9 (0.219)	-7.51E-10 (0.395)	-8.53E-10 (0.329)	-8.71E-10 (0.256)
PREM	-1.53E-9** (0.039)	-1.53E-9** (0.035)	1.81E-9 (0.443)	2.60E-9* (0.100)	2.66E-9* (0.051)
Const.	11.21389*** (0.001)	11.21389*** (0.000)	-0.8254202 (0.849)	-2.73091 (0.656)	-0.7642758 (0.837)
R Square	0.4807	0.6638	0.0808	-	-
Adj.R2	0.4250	0.4807	0.0225	-	-

Source: Authors' calculations in the STATA program (2021)
Explanation: P-values are shown in parentheses: *** indicates statistical significance at the level of 1%; ** indicates statistical significance at 5% level and * indicates statistical significance 10%.

For interpretation, we will rely on Hausman - Taylor Regression. The Hausman-Taylor regression equation for the econometric model is:

$$NPL_{it} = \beta_0 + \beta_1 UEMP_{it} + \beta_2 INFL_{it} + \beta_3 GDPcap_{it} + \beta_4 RIR_{it} + \beta_5 FDI_{it} + \beta_6 PREM_{it} + \gamma_{it}$$

$$NPL_{it} = -2.73091 + 0.2521424 UEMP_{it} - 0.55344969 INFL_{it} - 0.2783786 GDPcap_{it}$$
$$+ 0.8723242_4 RIR_{it} - 8.53E^{-10} FDI_{it} + 2.60E^{-9} PREM_{it} + \gamma_{it}$$

β_0 - If all other factors are constant, then the value of NPLs will be -2.73091 units, but this is non-significant as it does not belong to any level of statistical significance.

β_1 - If unemployment (UEMP) increases by 1 unit keeping other factors constant, then NPLs will increase by 0.2521424 units. This statement is correct since the significance value (P-value = 0.042 <0.05) is in the range of statistical significance.

(β₂)- Based on this result and the trend of the analysed period (2010-2019) we can conclude that the increase in unemployment in the Western Balkans has had a negative impact on the growth of NPLs. The analysis also takes into account inflation, which is also significant and negative, implying that high inflation rates are associated with lower NPLs, and this is probably due to the reduction that results in real debt repayments, thus lower value of real debt. Therefore, if inflation increases by 1 unit, then NPLs will decrease by -0.55344969 units.

(β₃) - From the above results, GDP presents a negative relationship with NPLs, indicating that improved macroeconomic conditions lead to lower NPLs due to higher returns, Therefore, if GDP per capita increases by 1 unit, then NPL will be reduced by -0.2783786 units. However, this statement is not in the range of statistical significance. Non-significance of the study findings may have resulted from the use of a small research sample. Using a larger sample can provide significant negative relationships between variables.

(β₄) - Rising real interest rates lead to increased NPLs. Therefore, in our case study if the real interest rate (RIR) increases by 1 unit keeping the other factors constant, then NPLs will increase by 0.8723242 units and this statement is correct since the value of the significances (P-value = 0.000 <0.01) is in the range of statistical significance.

β₅- We see that there is a negative relationship between FDI and NPLs. Therefore, with the increase of foreign direct investment, NPLs decrease. As new jobs can be offered, overall economic growth, etc., is affected. However, we see that it is non-significant (P-value = 0.329 <0.1) which means that the FDI inflows do not have a significant impact on the level of NPLs in the Western Balkan countries.

β₆ - The relationship between personal remittances received and NPLs can be seen as positive and this shows that with the increase in remittances NPLs also increase and this is significant as it is in the range of statistical significance (P-value = 0.100 = 0.100).

5.2. Econometric Model's Results of The Western Balkan Countries:

Table 6 summarizes all descriptive statistics for all variables included in the econometric model of the selected OECD countries.

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Table 6. Descriptive Statistics for The Variables Included In The Econometric Model of Selected OECD Countries

Variables	Obs.	Mean	Std. Deviation	Minimum	Maximum
NPL	202	3.867129	4.653585	.15	25.71
UEMP	210	7.351905	4.053397	1.93	26.09
INFL	210	1.763429	1.411615	-1.14	7.51
GDP per capita	209	1.748421	2.370963	-3.24	23.99
RIR	181	3.154254	2.732265	-3.86	10.25
FDI	210	6.31e+09	6.01e+10	-4.13e+11	2.12e+11
PREM	210	6.27e+09	7.63e+09	5.90e+07	3.90e+10

Source: Authors' calculations in the STATA program (2021)

Table 7 shows the Pearson correlation coefficient values between NPL and other independent variables (UEMP, INFL, GDP per cap., RIR, FDI, PREM) in the selected OECD countries' econometric model:

Table 7. Correlation Analysis for The Variables Included In The Econometric Model

Variables	NPL	UEMP	INFL	GDP per capita	RIR	FDI	PREM
NPL	1.0000						
UEMP	0.5357	1.0000					
INFL	-0.1057	-0.0545	1.0000				
GDP per cap.	0.0628	-0.0836	-0.0786	1.0000			
RIR	0.2632	0.3921	0.0253	-0.0329	1.0000		
FDI	-0.0471	-0.0241	-0.1741	-0.0451	-0.1061	1.0000	
PREM	-0.0177	-0.1313	0.1903	-0.1208	0.0195	-0.0109	1.000

Source: Authors' calculations in the STATA program (2021)

Based on the above correlation table we can conclude that all the variables incorporated in the econometric model are correlated with each other. We first analysed the correlation between the dependent variable NPLs and the independent variable UEMP (unemployment). Results show that NPLs have a positive average correlation with UEMP (R = 0.5357), which means that an increase in unemployment will increase NPLs in the selected OECD countries. The value of the Pearson ratio between NPLs and inflation (INFL) is negative and weak (R = -0.1057), meaning that inflation has an impact on reducing the value of NPLs. The correlation between NPLs and GDP is also weak (R = 0.0628), indicating a positive linear relationship between these two variables. Therefore, with an increase in GDP in the countries of the selected OECD countries, we will have an increase in the value of NPLs.

NPLs and real interest rate (RIR) have a weak positive linear relationship (R = 0.2632). Therefore an increase in the real interest rate, increasing the value of NPLs. Also, there is a weak negative linear relationship between NPLs and FDI (R = -0.0471), and an increase in the FDI will result in a decrease in the value of NPLs. The linear relationship between NPLs and PREM is weak and negative (R = -0.0177), which means that with an increase in remittances we will have a decrease in the value of NPLs.

Table 8. Econometric Results and Empirical Findings of The Study For The Selected OECD Countries

Variables	Linear Regression	Random Effects – GLS Regression	Fixed – Effects Regression	Hausman – Taylor Regression	GEE Model
NPL	-	-	-	-	-
UNEMP	0.6182763*** (0.000)	0.7682657*** (0.000)	0.8101323*** (0.000)	0.8021014*** (0.000)	0.7572446*** (0.000)
INFL	-0.2989835 (0.164)	-0.1181592 (0.297)	-0.117925 (0.300)	-0.1155317 (0.307)	-0.1184651 (0.356)
GDPcap.	0.2181463* (0.090)	-0.0688514 (0.256)	-0.00732286 (0.229)	-0.00653816 (0.280)	-0.0668739 (0.330)
RIR	0.1005398 (0.415)	0.1085909 (0.131)	0.1030157 (0.156)	0.1008211 (0.161)	0.110289 (0.175)
FDI	-3.05E-12 (0.553)	-1.00E-12 (0.680)	-1.16E-12 (0.632)	-1.06E-12 (0.660)	-9.64E-13 (0.725)
PREM	5.20E-11 (0.221)	5.37E-11 (0.437)	7.15E-11 (0.405)	7.82E-11 (0.269)	5.04E-11 (0.469)
Const.	-1.040359 (0.237)	-2.213112* (0.067)	-2.445559** (0.014)	-6.409073** (0.031)	-2.114558* (0.093)
R Square	0.3144	0.2606	0.2586	-	-
Adj.R2	0.2903	0.2904	0.2892	-	-

Source: Authors' calculations in the STATA program (2021)
Explanation: P-values are shown in parentheses: *** indicates statistical significance at the level of 1%; ** indicates statistical significance at 5% level and * indicates statistical significance 10%.

The equation for the econometric model is:

$$NPL_{it} = \beta_0 + \beta_1 UEMP_{it} + \beta_2 INFL_{it} + \beta_3 GDPcap_{it} + \beta_4 RIR_{it} + \beta_5 FDI_{it} + \beta_6 PREM_{it} + \gamma_{it}$$

When comparing to the countries of the Western Balkans, in the selected OECD countries one can see that in many cases the independent variables do not have a significant impact, except for unemployment, which is the main independent variable of this econometric model. We can see that unemployment is positively correlated with NPLs in all the statistical tests defined above and that all are significant at the 1% significance level, demonstrating that NPLs increase as unemployment increases.

Despite unemployment, inflation has a negative relationship with NPLs, thus with the increase of INFL, NPLs decrease, but do not have a significant impact. GDP per capita has a negative relationship with NPLs except in the Linear Regression test which is also significant, while all other tests are not, at any level of significance.

The RIR also has a positive relationship with NPLs, but in all tests, it has no significant impact. The same applies to FDI. However, FDI has a negative and not a positive relationship with NPLs. Therefore, as investment increases, NPLs decrease. PREM received have a positive relationship with NPLs, the increase in remittances increases NPLs, but even this is not significant in any of the tests for selected OECD countries.

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6. CONCLUSION AND RECOMMENDATIONS

NPLs are a very important indicator of the health of a country's banking system and consequently of its economic health. In this study, the aim was to assess the correlation between NPLs and unemployment in both the Western Balkan countries and some of the selected OECD countries, taking into account the impact of other exogenous factors such as INFL, GDP per capita, RIR, FDI and PREM received.

Based on the econometric results and empirical findings of this study, we can conclude that unemployment as an independent variable negatively affects the dependent variable NPLs (i.e. the Growth in NPLs) of both the Western Balkan countries as well as those selected by the OECD and is statistically significant. Such results confirm the validity of our hypotheses. Therefore, Ha1 is accepted partially and significant for unemployment, inflation, real interest rate and personal remittances received. Hb1 is accepted partially and significant only for unemployment and GDP per capita. These econometric results have been tested using five statistical tests and all these measurements corroborate the findings of Mazreku et al. (2018), Turan and Koskija (2014) and Klein (2013), but contradict findings by San (2016).

Furthermore, we can conclude that the independent variable INFL is significant and has affected the reduction of NPLs in the Western Balkans, but it is insignificant in the selected OECD countries. Theoretically, high inflation should lower the real value of debt and thus make debt repayment easier. However, high inflation can lead to nominal interest rates and weaken the ability of some borrowers to service debt by lowering real incomes when wages are high. Also, high inflation should lower the real value of debt and thus make it easier to service debt. However, high inflation can be passed on to nominal interest rates and weaken the ability of some borrowers to service debt by lowering real incomes when wages do not change.

Also, we have noted from the tests carried out that the independent variable GDP per capita has had a positive impact on reducing NPLs of selected OECD countries for the period analysed. As people have more disposable income, it is easier for them to meet their loan repayment obligations. However, tests results show a negative relationship between these two variables, the tests for both the Western Balkan countries and the OECD was not significant.

Results of the econometric models show that the relationship between the RIR and NPLs is statistically significant and has an impact on its growth in the Western Balkan countries. However, this relationship is not statistically significant with the selected OECD countries. In selected OECD and Western Balkan countries, FDI has a negative relationship with NPLs, meaning that with an increase in investment there is a decrease in NPLs. However, the correlation between NPLs and remittances is positive, and has an impact on the growth of NPLs in the Western Balkan countries, while there is a statistically insignificant negative relationship in the selected OECD countries. These findings have

important implications for the stability and health of the banking sector within transition economies, as they underscore the importance of macroeconomic conditions. In particular, the result underscores the need for pro-development macroeconomic policies within these countries, the need to attract domestic and foreign investment to increase growth and employment.

Such empirical evidence is very important and makes a scientific contribution to the policymakers of governments and their central banks. These findings are especially important for countries that are still in the transition of economic development must maintain lower levels of unemployment to have a positive effect on NPLs.

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