# CHAPTER 5

# RESULTS AND DISCUSSION

## 5.1 Introduction

This chapter discusses the econometric outputs of the three proposed models, which address the research objectives. As mentioned earlier, the ARDL technique is used to perform the analysis of the data. Primarily, the analysis begins with a summary of the descriptive statistics of the data providing more details on the nature and many other facts pertained to the examined sample. The ARDL test is formulated based on the F- statistics, which in turn functions as an indicator for the long run relationship. Numerous diagnostic tests were executed to ensure the adherence of the data to the statistical norms such as autocorrelation, functional form, normality, heteroscedasticity, CUSUM and CUSUM. Further, the study generates the results pertained to long and short run elasticities to explain the relationships between independent variables and dependent variables.

## 5.2 Testing the Macroeconomic Determinants of Foreign Direct Investment Inflows

The normal approach of reporting the analysis is mostly characterized by providing a detailed discerption of the used data. With that in mind, the below table yields the descriptive statistics of the following variables: Foreign direct investment (LNFDI), growth rate (LNGDPR), external debt (LNED), government expenditures (LNGE), trade openness (LNTO), labour force (LNLAB) and consumer price index (LNCPI). Observing a number of elements into the below table such as mean, median,

maximum, minimum, standard deviation, skewness, and kurtosis would help us to comprehend the mixture of the observed exogenous and endogenous factors. Table 5.1 shows the necessary figures of the variables over the period 1881 – 1913. The presented results in the descriptive statistics are the values of after the logarithm transformation of the data. Information such as mean, median, maximum, minimum, standard deviation, skewness, and kurtosis are presented in the below table.

The results show that all the variable except LNFDI (mean = -0.6758) are having a positive mean and standard deviation. They also have a positive maximum and minimum value of all the tested variables. Moreover, it is obvious that the mean and median are close to each other, which determine a good sign that the data is having a high chance of supplying a reliable output. Concerning the standard deviation, the revealed result show that the average or typical distance scores varied from the mean. For instance, for LNED the typical distance from the mean was by about 3.8579 and for LNTO was 2.1285.

**Table 5.1:** Descriptive Statistic for Model of Foreign Direct Investment Inflows

| | **LNFDI** | **LNED** | **LNGDPR** | **LNGE** | **LNTO** | **LNLAB** | **LNCPI** |
|---|---|---|---|---|---|---|---|
| **Mean** | -0.6758 | 4.0731 | 0.1058 | 2.5041 | 2.2255 | 1.7694 | 4.3497 |
| **Median** | -0.5635 | 4.1790 | 0.6931 | 2.5149 | 2.2289 | 1.7963 | 4.3372 |
| **Maximum** | 1.7574 | 4.2818 | 0.9163 | 2.8452 | 2.4337 | 2.0143 | 4.6052 |
| **Minimum** | 2.8735 | 3.6817 | -1.8971 | 2.2742 | 1.9939 | 1.4115 | 4.1531 |
| **Std. Dev.** | 1.2257 | 0.2152 | 1.1537 | 0.1458 | 0.0970 | 0.1693 | 0.1243 |
| **Skewness** | 0.0155 | -0.6737 | -1.1829 | 0.1865 | -0.2804 | -0.3527 | 0.3390 |
| **Kurtosis** | 2.3536 | 1.8473 | 2.4305 | 2.4605 | 2.9103 | 2.1841 | 2.1783 |
| **Observations** | 33 | 33 | 33 | 33 | 33 | 33 | 33 |

The presence of unit root was identified via the usage of the three common methods Augmented Dickey-Fuller (ADF), followed by more powerful unit root namely Philip-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root

tests. This preliminary test is considerably important that allow the data to be usable as running ARDL requires a testing the stationarity of the data. The computed p-value of the variables is compared to the absolute value of 1%, 5% and 10% respectively. In case where the computed p-values are significantly greater than the absolute p-value, then the null hypothesis of the presence of unit root or non-stationarity is not rejected and the results are in favour of the alternative hypothesis.

The tests reveal that the variable LNTFDI at level is proved to be stationary for both intercept (5% significant level) and trend and intercept (1% significant level). Further, LNGDPR was found to be stationary as well at level for both intercept (5% significant level) and trend and intercept (1% significant level). The remaining variables were also sharing the same features. Moreover, at first difference the ADF test was performed. Table 5.2 showed that there is a mixture of stationarity for the intended variables for both at intercept and trend and intercept even for PP unit root test.

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**Table 5.2:** ADF and PP Unit Root Tests for Model of Foreign Direct Investment Inflows

| Level | ADF Unit Root Test | | PP Unit Root Test | |
|---|---|---|---|---|
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNFDI** | -3.2174(0)** | -3.0903(0) | -3.0522(7)** | -2.8837(7) |
| **LNED** | -0.7220(0) | -1.9220(0) | -0.7908(1) | -2.1236(2) |
| **LNGDPR** | -1.7338(0) | -1.7032(0) | -1.7229(2) | -1.7032(0) |
| **LNGE** | -2.8930(0)* | -2.700(0) | -2.9532(2)* | -2.7574(2) |
| **LNTO** | -2.4016(0) | -3.0775(0) | -2.3525(3) | -2.8532(5) |
| **LNLAB** | -1.7651(0) | -3.6095(0)** | -2.0827(31) | -3.4041(9)* |
| **LNCPI** | -0.9993(0) | -0.9437(0) | -0.9993(0) | -0.7704(3) |
| **First Difference** | **ADF Unit Root Test** | | **PP Unit Root Test** | |
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNFDI** | -6.1275(0)*** | -6.1220(0)*** | -8.9561(30)*** | -11.8229(30)*** |
| **LNED** | -4.8287(0)*** | -4.7496(0)*** | -4.8287(0)*** | -4.7496(0)*** |
| **LNGDPR** | -5.6008(0)*** | -5.6643(0)*** | -5.6023(2)*** | -5.7330(4)*** |
| **LNGE** | -6.6656(0)*** | -6.3818(0)*** | -6.6508(1)*** | -6.4130(2)*** |
| **LNTO** | -5.7853(0)*** | -5.7065(0)*** | -10.7418(30)*** | -12.8064(30)*** |
| **LNLAB** | -6.2978 (1)*** | -6.3229(1)*** | -9.7764(24)*** | -11.9335(21)*** |
| **LNCPI** | -5.0258(0)*** | -5.3880(0)*** | -4.9993(3)*** | -5.4707(6)*** |

Notes: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz Info Criterion (SIC) for ADF test and the bandwidth had been selected by using the Newey–West method for PP unit root test.

To ensure that the result of unit root test is robust enough, a KPSS is applied for each variable. The null hypothesis for the test is that the data is stationary. To interpret the outcomes of KPSS, the LM has to be observed if it is greater than the critical value (alpha levels of 10%, 5% and 1%), then the null hypothesis "the series is non-stationary" is rejected. if the estimated test statistic is less than the critical values then it means failing to reject the null of stationarity. The outcomes of this particular test show that the all variables are significant at level at 5% or 1% at level except for FDI. Table 5.3 displays the findings of KPSS.

**Table 5.3:** KPSS Unit Root Tests for Model of Foreign Direct Investment Inflows

| Variable | KPSS | |
|---|---|---|
| **Level** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.1737(3) | 0.1156(3) |
| **LNED** | 0.5494(5)*** | 0.0989(4) |
| **LNGDPR** | 0.5451(4)*** | 0.1578(4)*** |
| **LNGE** | 0.1997(4) | 0.1748(4)*** |
| **LNTO** | 0.5105(3)*** | 0.1460(2)** |
| **LNLAB** | 0.7489(4)*** | 0.1291(2)** |
| **LNCPI** | 0.1550(4) | 0.1571(4)** |
| **First Difference** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.5000(31)*** | 0.5000(31)*** |
| **LNED** | 0.0941(1) | 0.0838(1) |
| **LNGDPR** | 0.1496(2) | 0.0681(4) |
| **LNGE** | 0.2211(2) | 0.0881(5) |
| **LNTO** | 0.5000(31)*** | 0.5000(31)*** |
| **LNLAB** | 0.4397(26)** | 0.2877(20)*** |
| **LNCPI** | 0.3249(3) | 0.1248(9)** |

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively.

Thus, the ARDL approach to cointegration seems to be the approach econometric analysis that preferably used to measure the relationship between the variables proposed in the model. The table 5.4 shows the ARDL using F-test. The optimum lag was obtained using Akaike Information Criterion (AIC) for an annual data with a maximum lag that was set to be 4. Given that, the optimum order for the suggested model is 1,0,3,2,1,3,3 and the F-statistic obtained from the optimum lag was relatively greater than its upper bound critical value. It is therefore a solid indication that there is an existence of long run association between the examined variables and the table 5.4 shows the ARDL using F-test.

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**Table 5.4:** ARDL Tests For Co-Integration For Model Of Foreign Direct Investment Inflow

| Model | | AIC (Lag order) | F Statistic |
|---|---|---|---|
| **LNFDI = F(LNED,LNGDPR, LNGE,LNTO,LNLAB,LNCPI)** | | (1, 0, 3, 2, 1, 3, 3) | 7.8487*** |
| **Critical Values for F-statistics#** | | **Lower Bound, I (0)** | **Upper Bound, I (1)** |
| **k = 6** | **1%** | 3.15 | 4.43 |
| | **5%** | 2.45 | 3.61 |
| | **10%** | 2.12 | 3.23 |

Note: # The critical values are obtained automatically under Eviews 9, k is several variables (IV), critical values for the bounds test: case III: unrestricted intercept and no trend. *, **, and *** represent 10%, 5% and 1% level of significance, respectively.

The diagnostic statistic as it is portrayed in table 5.5 provides a concrete evidence that the proposed model is well structured. In fact, none of the statistics (probability value) shown in the below table are significant at 1%, 5% and 10% level. Observing the critical value of one degree of freedom, it is obvious that the null hypothesis of normality of residuals, null hypothesis of no first-order serial correlation, and the null hypothesis of no heteroskedasticity was accepted.

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**Table 5.5:** Diagnostic Tests for Model of Foreign Direct Investment Inflows

| Model | (A) Serial Correlation (P-value) | (B) Functional Form (P-value) | (C) Normality (P-value) | (D) Heteroscedasticity (P-value) |
|---|---|---|---|---|
| **LNFDI = F(LNED,LNGDPR, LNGE,LNTO,LNLAB,LNCPI)** | 0.3818 [0.6944] | 1.5737 [0.2413] | 0.2797 [0.8694] | 1.7805 [0.1755] |

Note. 1. The numbers in brackets [ ] are p-value. 2. The diagnostic test performed as follows A. Lagrange multiplier test for residual serial correlation; B. Ramsey's RESET test using the square of the fitted values; C. Based on a test of skewness and kurtosis of residuals; D. Based on the regression of squared fitted values.

To better scrutinise the reliability of the diagnostic analysis, CUSUM and CUSUMSQ were performed on the model. Having the plots of both CUSUM and CUSUMSQ fell inside the critical bounds of five % significance level is a good indication that the model is stable. Figure 5-1 below displays the plots of CUSUM and CUSUMSQ tests.

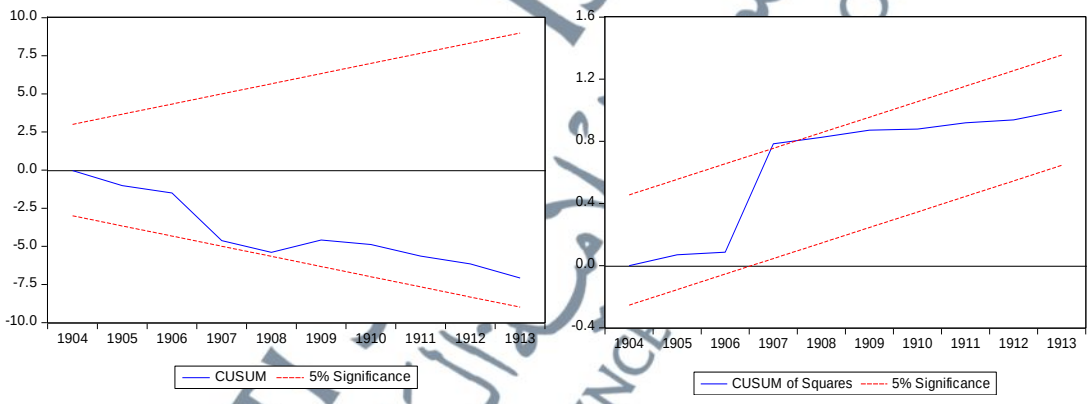


**Figure 5.1:** CUSUM and CUSUMSQ Stability Tests for Model of Foreign Direct Investment Inflows

Table 5.6 depicts long run elasticities of the variables (LNGDPR; LNLAB; LNTO; LNED; LNCPI; LNGE). The coefficients of five variables showed long-run significance in explaining the dependent variable (LNFDI). The signs of the coefficients of LNLAB, LNTO, LNED and LNGE are negative. Starting with the implication of the LNGDPR, the results show a non-significant relationship between economic growth rates (LNGDPR) and total foreign direct investment inflows (LNFDI). With a

coefficient at 0.3398, the association between the two variable seems to be weak and this comes in line with a number of prior studies that provide evidences on such linkage. The question of whether economic growth might influence FDI inflows is still triggering numerous studies around the globe. Indeed, the results still vary due to the different type of method sample, and time trend of the observations. From this perspective of, Boyd & Smith (1992), and Ang (2009) found that a negative association. Other researchers Hanson (2001), Akinlo (2004) and Herzer & Klasen (2008) put forward the notion that there has been an absence on the relationship between economic growth and FDI inflows.

Economists such as Biglaiser & DeRouen (2011) found that high GDP could display a higher value of FDI investment. However, in some cases FDI is found to be insignificant in terms of its association with economic growth since it is not necessarily expedite the process of spills over effect in local firms. For instance, Azman-Saini et al., (2010), found that FDI inflows has no correlation with economic growth instead, it largely hinges on the factor of financial growth or their policy of economic freedom in the host country. Moreover, Alguacil et al., (2011) provide evidences using GMM method suggesting that FDI inflows have no effect on developed countries. These results create a tendency among policy makers to promote policies that encourage and support inward FDI. Work done by Carkovic & Levine (2005) confirmed that there is a weak link between FDI and economic growth.

From the causality perspective, Lyroudi et al., (2004) studied the economic growth impact of FDI in a panel of transition economies over the period 1960-2005 using a panel general method of moment estimator. The study found a weak link between FDI and economic growth. More recently, Bermejo Carbonell & Werner (2018) reported that despite the favourable Spanish circumstances yet, no evidence for

FDI to stimulate economic growth. Such findings is also found by Kim (2010) who stated that recipient countries with higher level of corruption tend to receive more FDI inflows from developed and politically stable countries. That shows that FDI did not exert any significant effect on economic growth. This led many several economists to call for policies that encourage and support inward FDI.

Within the context of OE, the FDI was clearly unsupportive to the economic growth as the majority of the investments were established as a part of political pressure by the European countries (Geyikdagi & Geyikdagi, 2011). One clear example of this was the railway projects that were created with the intention of expansion of European markets over the local one. In this sense, the nature of the Ottoman economy, which was relied on agricultural industry to generate earnings, did not convince the outsiders to further engage in certain profitable sectors (Kula, 1997). Besides that, the financial system was mainly controlled by OPDA, which functioned to strengthen the presence of European investors without contributing to the real growth of the Ottoman economy (Blaisdell, 1929). Another factor was the trade convention that the OE signed with various countries. Under these treaties, tax exemptions were granted at many levels which ultimately led to a serious diminishing of the funds and created a need for the state to seek the external financing. Given these fact, it is reasonable to find that FDI does not have a significant relationship with economic growth.

For the impact of labour, (LAB) shows a sign of significant and negative at 1% significant level in which a 1% increase in LAB decreased the LNFDI by 8.64%. This means that the existing labour cost in OE was not attractive enough for the FDI inflows. This finding is supported by prior studies that measure the relationship between labour and FDI. For instance, Boghean & State (2015) found that of a weak connection between foreign direct investments inflows and average labour productivity in countries

of the European Union. The econometric results derived from the study of Malikane & Chitambara (2017) provide concrete evidence that there is a weak effect of FDI on productivity growth in the African countries over the period 1980 –2012. The rational explanation behind the negative sign found in the relationship between FDI and labour is relatively pertained to the fact the FDI project tend to focus on limited sectors that might not be suitable for the local labour market.

In addition to that, the lack of expertise was one of the main driver in reducing the engagement of foreign investors in hiring Ottomans. Moreover, the FDI projects were applying machineries in executing the works, which ultimately minimize the demand over the headcounts (Geyikdagi, 2011). Bearing in mind that the industrial revolution was at its peak period where the European countries tried to implement such revolutionary methods in their industrial sectors.

The trade openness (LNTO) coefficients showed a significant and negative relationship between LNTO and LNFDI. This result highlights the argument that trade liberalization practice in OE was not in favour of attracting FDI. Though several empirical studies advocate the arguments that FDI has a positive impact on trade openness in recipient countries, yet this is not the case in OE where a negative relationship is detected. Our results contradicts prior studies which showed a strong and positive correlation between trade openness and foreign direct investments (Ho & Booth, 2017; Nguyen et al., 2018; Belloumi, 2014; Eris & Ulas, 2013; Hakimi & Hamdi, 2016; Musila & Yiheyis, 2015).

An openly practice free market able to attract potential investors to invests more into the country by stimulating technological transfer and innovations. Indeed, trade openness is described as the capability of a certain economy to integrate into the economic activities in the world. For OE, the integration was part of European

domination whereby government applied a 12% tax on the exports and only 3% on imported goods from European (Pamuk, 2006). Certainly, there was a political agenda behind such decisions, which further weakened the Ottoman economy and led to a trade deficit and changes in exchange rate.

Next, external debt depicts a significant and negative association between LNED and LNFDI. The coefficient appeared in this model can be interpreted as 1% increase in LNED created a decrease in the LNFDI by 9.28%. This results matches with the previous empirical studies that show statistically significant with negative sign. For instance, Nunnenkamp (1991) find that higher debt burden creates constraints to the FDI inflows in Pakistan. Azam & Khan (2011) addressed the LNED-LNFDI nexus and they found that FDI is negatively affected by the country's bad debt condition and signifies a relatively unfavourable environment for foreign investment.

Theoretically, Krugman (1988) contends that that debt overhang arises when the expected repayment on foreign loans missed the due date, which created an increase in the debt service and hence increasing function of the country's output level. This means that a high debt burden tends to portray an expectations to the lenders that debt will be financed by distortionary measures (e.g; financial repression or other punitive taxes or expenditure cuts).

These measures will certainly push forward for a negativity among foreign investors as the concerns over lower or riskier investment, greater uncertainty about future returns, and potentially lower growth prospects are undeniable (Calvo, 1998; Clements et al., 2003). Having said that, the external debts are empirically proved to curb the inflow of FDI in OE. This indicates that the tendency of foreign investors in directing their investment towards OE was a risky decision as the state was experiencing a serious debt trap. This despite the privileges and incentives given to those investors

but it was evident that the FDI inflow level was at its lowest average compared with other European countries.

Further, for the impact of inflation proxied by CPI, the result show a significant and positive to LNTFDI. This finding is similar to the findings of the prior researchers (Nazir et al., 2012; Rashid & Husain, (2013); Kim et al., 2008; Ercakar, 2011). Despite the conflicting results of the nexus between inflation and LNTFDI, the study of Hashim et al., (2009) agreed with Sajib et al., (2012) in which a negative relationship between inflation and FDI was found.

The conflicting result might be attributed to because the econometric models used in the co integration techniques and treats inflation as a control variable. As far as the result of this study is concerned, the inflation in OE was stable for the examined period and the FDI inflows reached a peak of US$ 11 Million Pound in 1891 with a CPI at 72.51. It is worth noting that the Ottoman economy was witnessing a number of tobacco and salt company to French investors. With that and along with all its incentives to make the country attractive to foreign investors, the Ottoman economy was incapable to benefit from the FDI. The reasons have been briefly discussed earlier which can be summarized in the lack of political will in converting the Ottoman economy into an industrial economy.

Lastly, the negative and significant impact of government expenditure (LNGE) on LNFDI was present at 9.53%. This shows that government spending was not directed into bringing in FDI projects and instead it was shifted into other sectors such as the repayment of foreign loans or other corruptive channels. The economic reform that took place during the reign of Abdul Hamid 2 was not productive in the sense of creating a conducive environment for a robust private, domestic and foreign investment. Hence, it is evident that the Ottoman economy was suffering from a serious sickness to the extent

that the OE was named as 'sick man of Europe". Such conditions were unfavourable of attracting the FDI and the only reason behind the existing FDI projects was the expansion of European domination over the OE lands.

**Table 5.6:** Long-Run Elasticities for Model of Foreign Direct Investment Inflows

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **LNGDPR** | 0.3398 | 1.0208 | 0.3314 |
| **LNLAB** | -8.6436*** | -3.9369 | 0.0028 |
| **LNTO** | -23.3871*** | -4.7439 | 0.0008 |
| **LNED** | -9.2881*** | -4.2768 | 0.0016 |
| **LNCPI** | 25.1667*** | 4.1259 | 0.0021 |
| **LNGE** | -9.5357** | -2.3189 | 0.0429 |
| **C** | 19.4108 | 1.6445 | 0.1311 |

Note: (*), (**), (***) indicate significant at 10%,5% and 1% significant level respectively.

Further, Table 5.7 explains the results of short-run elasticities and error correction term (ECT). The short run elasticities elaboration is only based on zero lag. In the short run, the LNGDPR shows a non-significant relationship with foreign direct investment inflows (LNFDI). Next, it is found that LNLAB had significant and negative relationship. Furthermore, the variables LNTO, LNED and LNCP revealed a non-significant relationship with LNFDI. Based on the last tested variable, LNGE had a positive relationship with LNFDI. In terms of the practical implication of ECT, the presence of cointegration indicates that any one variable can be utilised as a policy variable to propose certain measures that aim to bring about the desired changes in other variables in the system. Form empirical perspective, the cointegration is perceived to be the occurred changes in the dependent variables whenever it linked with the changes in the other independent variables in the system. In other words, the changes in the

dependent variable are also a function of the degree of disequilibrium in the cointegrating relationship, which can be captured by the error correction term (ECT).

Indeed, the estimated lagged error correction term (ECT) in ARDL regression depicts to be negative and statistically significant and this is a necessary feature for the stability of the model stability. Importantly, the t-statistics on lagged residual of the ECM is statistically significant, again reinforcing the finding that the variables introduced in the model are cointegrated. In addition to that, the adjusted R-squared value of ARDL estimation is 0.90, which means that the variation of dependent variables is explained by the variation of independent variables by 90%.

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**Table 5.7:** Short Run Elasticities and Error Correction Term for Model of Foreign Direct Investment Inflows

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **D(LNGDPR)** | 0.3222 | 0.9682 | 0.3558 |
| **D(LNLAB)** | -11.0944 | -3.7954 | 0.0035 |
| **D(LNLAB(-1))** | -6.1869 | -1.9469 | 0.0802 |
| **D(LNLAB(-2))** | 5.4983 | 2.1107 | 0.0610 |
| **D(LNTO)** | -3.2129 | -1.4325 | 0.1825 |
| **D(LNTO(-1))** | 4.5088 | 1.8329 | 0.0967 |
| **D(LNED)** | -3.7561 | -1.4138 | 0.1878 |
| **D(LNCPI)** | 1.4193 | 0.4769 | 0.6437 |
| **D(LNCPI(-1))** | 1.7439 | 0.5718 | 0.5800 |
| **D(LNCPI(-2))** | -11.6197 | -4.0111 | 0.0025 |
| **D(LNGE)** | 3.5591 | 2.1822 | 0.0540 |
| **D(LNGE(-1))** | 0.7398 | 0.2959 | 0.7733 |
| **D(LNGE(-2))** | 11.9781 | 5.0063 | 0.0005 |
| **ECT(-1)** | -0.9482 | -6.0700 | 0.0001 |
| **R square** | 0.90 | 5.2914 | 0.0050 |
| **Adj. R square** | 0.73 | | |

Dependent variable is DLNFDI. (*), (**), (***) indicate significant at 10%,5% and 1% significant level.

The first research objective scrutinizes the possible effect of selected macroeconomic determinants of FDI inflows in OE. Given the importance of FDI in determining the performance of an economy, this study shows that the Ottoman economy failed to attract FDI inflows and it empirically proved that FDI was a tool that was used to weaken the local industries. The examined model introduces macroeconomic variables such as economic growth rates (LNGDPR), trade openness (LNTO),labour (LNLAB), external debt (LNED), inflation (LNCPI) and government expenditure (LNGE). The finding on long run elasticities reveal that LNGDRP, which represents economic growth rates, has not shown a significant influence on the LNFDI. However, LNTO , LNLAB, LNED and LNGE show a significant and negative sign. Meanwhile, the inflation LNCPI shown a significant and positive relationship.

## 5.3 Testing the Macroeconomic Determinants of External Debt

The analysis of this particular model commences with the ordinary descriptive statistics. This is to ensure that the data is presented in a formal approach. Table 5.8 summarises the statistics Foreign direct investment (LNFDI), GDP per capita (LNGDP), external debt (LNED), government expenditures (LNGE), trade openness (LNTO), Interest service (LNIS). Considering to the following elements mean, median, maximum, minimum, standard deviation, skewness, and kurtosis would indicate the mixture of the observed exogenous and endogenous factors. For instance, it is apparent that all the variable except LNFDI (mean = -0.6758) are having a positive mean and standard deviation. Besides that, mean and median, which implied the normal distribution of the data, were close enough to each, thus, provided more robust analysis. The value stated in the below table are basically represented in a form of logarithm. The descriptive statistics of the data, it is apparent that the differences between minimum and maximum values of interest service (LNIS), external debt (LNED) and FDI were big enough for a robust analysis. It implies the increasing trend of the variables. The value of mean and median of variables in all the selected countries was close to each other. This concludes that the variables are normally distributed.

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**Table 5.8:** Descriptive Statistic For Model of External Debt

| | LNED | LNFDI | LNGDP | LNGE | LNTO | LNIS |
|---|---|---|---|---|---|---|
| **Mean** | 4.0731 | -0.6758 | 2.4098 | 2.5041 | 2.2255 | 0.8406 |
| **Median** | 4.1790 | -0.5635 | 2.3873 | 2.5149 | 2.2289 | 0.6618 |
| **Maximum** | 4.2818 | 1.7574 | 2.5351 | 2.8452 | 2.4337 | 1.3125 |
| **Minimum** | 3.6817 | -2.8735 | 2.3713 | 2.2742 | 1.9939 | 0.4774 |
| **Std. Dev.** | 0.2152 | 1.2257 | 0.0460 | 0.1458 | 0.0970 | 0.3130 |
| **Skewness** | -0.6737 | -0.0155 | 1.3023 | 0.1865 | -0.2804 | 0.6720 |
| **Kurtosis** | 1.8473 | 2.3536 | 3.5638 | 2.4605 | 2.9103 | 1.5359 |
| **Observations** | 33 | 33 | 33 | 33 | 33 | 33 |

Following the same method of analysing the suitability of the data, unit root test is also being utilized so a broader image on data is generated. Analysing the stationarity of data is a key aspect in determining the powerfulness of the result. Practically, the bound test requires the variables either only stationary at first difference, I (1) or a mixture of stationary at the level, I (0) and at first difference, I (1). In addition to that, it is essential that the result of unit root test reveals variables are not integrated of order two, I (2) or beyond as rules set by the bound test. Two types of unit root test that were used in this analysis are ADF, and PP. Given the null hypothesis of the series with a unit root was tested against the alternative of stationarity, two tests were applied ADF and PP. In contrast, the KPSS test holds the premise that null hypothesis does not contain unit root while alternative hypothesis has a unit root. In the below table 5.9 a summary of the outcomes of ADF and PP are presented. In nutshell, the finding provide evidences that there is a mixture of stationarity at I (0) and I (1) for the proposed variables in the model, and with that, it is justifiable to move forward with the use of bound testing for cointegration.

**Table 5.9:** ADF and PP Unit Root Tests for Model of External Debt

| Level | ADF Unit Root Test | | PP Unit Root Test | |
|---|---|---|---|---|
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNED** | -0.7220(0) | -1.9220(0) | -0.7908(1) | -2.1236(2) |
| **LNFDI** | -3.2174(0)** | -3.0903(0) | -3.0522(7)** | -2.8837(7) |
| **LNGDP** | -3.0001(0)** | -2.5141(0) | -2.9608(1)** | -2.5135(2) |
| **LNGE** | -2.8930(0)* | -2.700(0) | -2.9532(2)* | -2.7574(2) |
| **LNTO** | -2.4016(0) | -3.0775(0) | -2.3525(3) | -2.8532(5) |
| **LNIS** | -0.7159(0) | -1.8956(0) | -0.7233(1) | -1.8956(0) |
| **First Difference** | **ADF Unit Root Test** | | **PP Unit Root Test** | |
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNED** | -4.8287(0)*** | -4.7496(0)*** | -4.8287(0)*** | -4.7496(0)*** |
| **LNFDI** | -6.1275(0)*** | -6.1220(0)*** | -8.9561(30)*** | -11.8229(30)*** |
| **LNGDP** | -4.5308(1)*** | -4.7772(1)*** | -4.5333(0)*** | -4.5876(2)*** |
| **LNGE** | -6.6656(0)*** | -6.3818(0)*** | -6.6508(1)*** | -6.4130(2)*** |
| **LNTO** | -5.7853(0)*** | -5.7065(0)*** | -10.7418(30)*** | -12.8064(30)*** |
| **LNIS** | -5.5940(0)*** | -5.5699(0)*** | -5.6041(3)*** | -5.6131(4)*** |

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz information criteria for ADF test, and the bandwidth has been selected by using the Newey–West method for the PP test.

Extra test was carried on to validate the above results. As per the generated outcomes from KPSS, a mix stationarity of the data is evident and for the suggested variables at I(0) and I(1). Therefore, the outcome reconfirm the usage of ARDL estimation. The outcomes of this particular test revealed that the all variables (LNFDI, LNED, LNGDP, LNGE, LNTO and LNIS) are significant at level at 5% or 1% at level except for FDI. Mix evidence of stationarity also occur at first difference. Thus, mix of stationarity in the data both at a level as well as at first difference was identified. Some of the variables in the model integrated in the order of one, I(1), while some integrated in the order of zero, I(0). Therefore, it sounds that the ARDL approach to cointegration is the most suitable types of analysis that can be conducted to find the relationship between the selected variables in the model. Table 5.10 displays the findings of KPSS.

**Table 5.10:** KPSS Unit Root Tests for Model of External Debt

| Variable | KPSS | |
|---|---|---|
| **Level** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.1737(3) | 0.1156(3) |
| **LNED** | 0.5494(5)*** | 0.0989(4) |
| **LNGDP** | 0.2669(4) | 0.1430(4)** |
| **LNGE** | 0.1997(4) | 0.1748(4)*** |
| **LNTO** | 0.5105(3)*** | 0.1460(2)** |
| **LNIS** | 0.6329(4)*** | 0.1482(4)*** |
| **First Difference** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.5000(31)*** | 0.5000(31)*** |
| **LNED** | 0.0941(1) | 0.0838(1) |
| **LNGDP** | 0.2809(1) | 0.1159(1) |
| **LNGE** | 0.2211(2) | 0.0881(5) |
| **LNTO** | 0.5000(31)*** | 0.5000(31)*** |
| **LNIS** | 0.0951(3) | 0.0793(4) |

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively.

The next step observes the long run or cointegration relationship between the variables. In doing so, F-test was conducted and the result is shown in the table 5.11. The optimum lags were obtained using AIC which is in this case 4,3,3,1,1,3. Keeping in mind the critical value, the study employs the Narayan (2004) for the bounds F-test. This is because the observation of this study is 33, which matches with the predication of critical value proposed by Narayan (2004). Hence, the ARDL bounds of the model demonstrates the existence of a long run relationship as the F-statistics in the below table is greater than its upper bound (5.1677) at 1% significant level. Thus, it is confirmed that there is an existence of long run between the variables.

**Table 5.11:** ARDL Tests for Co-integration for Model of External Debt

| Model | | AIC (Lag order) | F Statistic |
|---|---|---|---|
| **LNED = F(LNGDP,LNGE,LNTO,LNIS)** | | (4, 3, 3, 1, 1, 3) | 5.1677*** |
| **Critical Values for F-statistics#** | | **Lower Bound, I (0)** | **Upper Bound, I (1)** |
| | **1%** | 3.41 | 4.68 |
| **k = 4** | **5%** | 2.62 | 3.79 |
| | **10%** | 2.26 | 3.35 |

Note: # The critical values are obtained automatically under Eviews 9, k is several variables (IV), critical values for the bounds test: case III: unrestricted intercept and no trend. *, **, and *** represent 10%, 5% and 1% level of significance, respectively.

To clear any doubt pertained to the model, diagnostic tests are also performed in table 5.12 such as the LM statistics which tested the serial correlation, the misspecification by RESET test, heteroscedasticity and normality tests. Besides that, the stability of the coefficients is examined by testing the CUSUM and CUSUMSQ. The null hypothesis of normality of residuals, the null hypothesis of no first-order serial correlation, the null hypothesis of no heteroskedasticity and the null hypothesis of no misspecification of functional form were accepted.

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**Table 5.12:** Diagnostic Tests for Model of External Debt

| Model | (A) Serial Correlation (P-value) | (B) Functional Form (P-value) | (C) Normality (P-value) | (D) Heteroscedasticity (P-value) |
|---|---|---|---|---|
| **LNED = F(LNGDP,LNGE,LNTO,LNIS)** | 0.1855 [0.8353] | 2.1439 [0.1865] | 3.1134 [0.2108] | 1.3830 [0.3303] |

Note. 1. The numbers in brackets [ ] are p-value. 2. The diagnostic test performed as follows A. Lagrange multiplier test for residual serial correlation; B. Ramsey's RESET test using the square of the fitted values; C. Based on a test of skewness and kurtosis of residuals; D. Based on the regression of squared fitted values.

To enhance further the reliability of the output, both CUSUM and CUSUMSQ, fell inside the critical bounds (red) of five % significance as shown in Figure 5.2. This support the fact that the model is stable and the variables are structurally reliable in providing a proper forecasting without a major error.

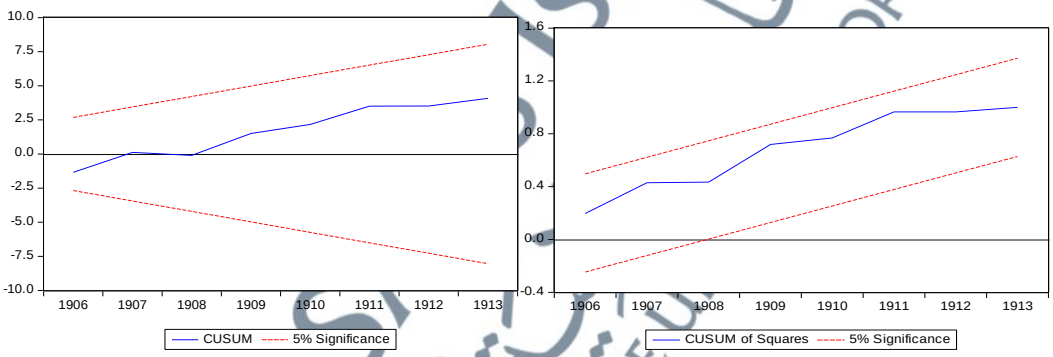


**Figure 5.2:** CUSUM and CUSUMSQ Stability Tests for Model External Debt

In explaining the long run elasticities, table 5.13 yields the outcome of the association between external debt (LNED) as dependent variable and (LNFDI, LNGDP, LNGE, LNTO and LNIS) as independent variables. To begin with foreign direct investment (LNFDI) which indicates a negative sign with a P-value (0.4087) which means that the association between the LNFDI and LNED does not exist. This result did not matches with the findings of the first model where the FDI was the dependent and LNED was the independent. As a matter of fact, external debt and FDI are

macroeconomic variables and hence they tend to strengthen the performance of an economy. This is due to their nature as both variable represent capital inflows that is needed to propel economic growth. In their study, Ostadi & Ashja (2014) found that negative association between FDI inflow and external debt. They also argue that increasing foreign debt deteriorates the perception of foreign investors' vision and created negative expectations of the future economy. An interesting fact about FDI inflow is its ability to solve the problem of foreign accumulated debt in developing countries if the borrowed loans are channelled to the right path (Tanna, 2018). This is because the excessive reliance on external debts is associated with tremendous risks. Unfortunately, OE witnessed a scenario whereby the state was under the threat of losing its sovereignty due to the foreign debts and the FDI projects were not able to shift the economy towards a better position.

Next, GDP per capita (LNGDP) revealed a significant negative sign whereby a 1% increase in GDP per capita led to a decrease in the external debt (LNED) by 1.5206%. Similar findings were found in the prior research. In fact, a large number of studies have been conducted to assess the LNED & LNGDP nexus. It is widely accepted among economists that external debt has negative consequences due to poor management of these loans. The negativity surrounding the consequences of debts tend to likely minimize any opportunity to better utilizing debt in more productive projects that will add value to the economy. In this regards, Presbitero (2012) provide empirical evidences that debt has a negative impact on economic growth when the debt is more than 90% of the GDP.

In another study, Calderón & Fuentes (2013) found a negative impact of external debt on economic growth in Latin America over the period 1970 & 2010. Akram (2011) and Rais & Anwar (2012) also come up with a similar conclusion for Pakistan for a

period between 1972 & 2009. Ezeabasili et al., (2011) and Chikuba (2003) shared the same findings for Nigeria and Zambia, respectively. Umaru et al., (2013) and Ada et al., (2016) also reinforced this stance based on the outcomes of their studies in Nigeria. The explanation that is more plausible is that shortage in government revenue, low levels of investment, and balanced budget deficits are rational reason that trigger the decision to borrow from abroad. Such numerous evidences provide a solid platform to argue that OE the policy to engage in external borrowing was a terrible decision. Hence, it is obvious based on the generated result that the economic growth of OE suffered from the accumulation of debts that impede any economic reforms.

The impact of government expenditure (LNGE) on external debt (LNED) presents a positive and significant sign. In details, a 1% increase LNGE will increase the external debts with 0.5367%. The debate over the association between public debt in general and government expenditure is still an unsettled issue both conceptually and empirically. Referring to Ricardian Equivalence Theorem, the linkage between government expenditure and government debt tend to be positive and significant. According to David Ricardo (1817), the government spending is a total pool that is based on equivalence of debt and taxes (Alam & Taib, 2012). In their study, Kohler-Tolghofer & Zagler (2007) confirmed this fact as they found a positive relationship between government wage and government debt. They also found that reducing the in government expenditure helps to improve the liquidity level and reducing the reliance on debts and tax revenue.

In the same vein, the former CEO of Malaysia Airlines Idris Jala stated that the Malaysian economy might face a serious economic crisis in 2019 if the government do not 1) cut subsidies 2) limit in borrowings. This warning message shows the importance of government spending in mitigating the bankruptcy. Observing the data of OE

between 1881 & 1913, the average ration of GE/ED was 5.4%, which indicates that the expenditures were financed by foreign loans and it reached its peak during the years 1896 & 1904 with total debts of 4 billion pound sterling. This was a huge amount to be borrowed for a country that was having a poor management of capital inflows such as loan and tax. Thus, it is not surprising to find that LNGE is having a positive impact on LNED.

Moreover, the coefficient of the trade openness's (LNTO) influence on external debt show a significant and positive sign. Based on this result higher openness to trade (TO) at 1% has improved the external borrowing by 0.2382%. This implies that a high dependence on exporting the primary goods and commodities will more likely to augment the demand on external borrowing (Zakaria, 2012). Adding to that, Khattry & Rao (2002) contend that trade liberation and the free trade treaties between countries might lead to export prices decrease due to an excess supply of similar products. Such trade condition can worsen the revenues directly through reduced export revenues or in indirect way via having a lower income earned from exports.

The export data in the OE during the examined period shows a deficit by 100 million pound sterling. This export deficit was mainly driven by the fiscal policy in which the state was applying exemption on imported goods while the exported goods were subject to 12% tax. From a different perspective, Auboin (2004) found that trade openness is more likely to improve the allocation of resources at national and international levels, which in turn creates a shield against the external debt shocks. He went further by saying that TO can also affect the debt servicing capacity if the country increases the net exports and foreign direct investment, which ultimately enhance the foreign exchange reserves. Further, the neo classical economists hold the idea that trade

liberation significantly affect the capacity of the saving's level and capital accumulation.

Lastly, this study tested the impact of interest service (LNIS) on the external debts (LNED). Table 5.13 presents the outcome of this linkage whereby a significant and negative sign was detected. A 1% increase in LNIS reduced the LNED coefficient to 0.7751%. This means that the higher payment of interest rate the lesser level of applying for external loans. In terms of debt inflows, the Ottoman economy was heavily reliant on debt inflows with a debt to GDP ratio of 74.06 percent, which is the highest during the 19th century. The existing literature (Pamuk, 1988; Eldem, 2005; Birdal, 2006) suggest that the shift of the OE to finance these deficits over the external borrowing without undertaking a solid fiscal discipline contributed to the disastrous collapse of the OE economy. To some extent, the foreign borrowing is beneficial for capital accumulation if it is managed properly and maintained within the allowable threshold, which is found to be around 61–69% of GDP (Tanna, 2018). However, some studies provide evidences that debt servicing reduces the capitals accessible for social sector like health and education. Thus, the debt servicing becomes a persistent problem to the developing nations as many of them fall into the debt trap "debt trap peonage".

**Table 5.13:** Long-Run Elasticities for Model External Debt

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **LNFDI** | -0.0111 | -0.8718 | 0.4087 |
| **LNGDP** | -1.5206** | -2.9092 | 0.0196 |
| **LNGE** | 0.5367*** | 5.7344 | 0.0004 |
| **LNTO** | 0.2382* | 1.9435 | 0.0879 |
| **LNIS** | -0.7751*** | -14.9996 | 0.0000 |
| **C** | 6.4792 | 6.5971 | 0.0002 |

Note: (*), (**), (***) indicate significant at 10%,5% and 1% significant level respectively.

To continue with the analysis, a short-run elasticity was performed and subsequently presented in the table 5.14. The estimates showed that LNFDI was not significant whereas the LNGDP depicts a significant and negative sign, which is matching with the long run elasticities. In terms of LNGE, the result here indicates a positive and significant linkage with LNED. Unlike LNTO, which shows a non-significant relation with LNED, the LNIS presents a strong negative and significant sign. Overall, all the variables interact in a similar manner in both the short run and long run with an exception of the variable LNTO. The ARDL analysis requires a further estimation for this model, which is the error-correcting term (ECT). According to Kremers et al., (1992), a significant and negative coefficient obtained for ECT is a good indication that the variables interacts with each other is consistent and reliable. Indeed, the ECT test is highly recommended to be significant so the policy makers would have a better understanding on the long-term consequences of their decisions that involve the proposed economistic model. Hence, this study detects a statistically significant ECT at 0.6647% with a P-value 0.0020. This outcome is vitally important for the validity of the examined model. The adjusted R-squared value of ARDL estimation is 0.99

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**Table 5.14:** Short Run Elasticities and Error Correction Term for Model of External Debt

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **D(LNED(-1))** | 0.2166 | 1.1339 | 0.2897 |
| **D(LNED(-2))** | 0.2036 | 1.0475 | 0.3255 |
| **D(LNED(-3))** | -0.2045 | -1.7524 | 0.1178 |
| **D(LNFDI)** | -0.0036 | -1.0440 | 0.3270 |
| **D(LNFDI(-1))** | 0.0101 | 1.8306 | 0.1045 |
| **D(LNFDI(-2))** | -0.0063 | -1.5311 | 0.1643 |
| **D(LNGDP)** | -1.3443 | -3.4457 | 0.0088 |
| **D(LNGDP(-1))** | 0.3729 | 1.3973 | 0.1999 |
| **D(LNGDP(-2))** | -0.4073 | -2.2042 | 0.0586 |
| **D(LNGE)** | 0.2107 | 2.3055 | 0.0500 |
| **D(LNTO)** | 0.0796 | 1.0580 | 0.3209 |
| **D(LNIS)** | -0.6715 | -20.1110 | 0.0000 |
| **D(LNIS(-1))** | -0.1550 | -0.7552 | 0.4718 |
| **D(LNIS(-2))** | 0.3671 | 2.1941 | 0.0595 |
| **CointEq(-1)** | -0.6647 | -4.5047 | 0.0020 |
| **R-squared** | 0.999068 | 428.6336 | |
| **Adjusted R-squared** | 0.996737 | 0.0000 | |

Dependent variable is DLNED. (*), (**), (***) indicate significant at 10%,5% and 1% significant level.

The second objective of this thesis intends to address the macroeconomic determinants of external debts within the context of OE. The econometric model includes GDP per capita (LNGDP), trade openness (LNTO), foreign direct investment (LNFDI), government expenditure (LNGE) and interest service (LNIS). The findings of the long run elasticities provide empirical evidences that the entire variables are statistically significant except FDI, which portrays a non-significant relationship with the LNED.

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## 5.4 Testing the Macroeconomic Determinants of Economic Growth Model

The first section begins with the description of descriptive statistics, which can be seen in Table 7-1. Given the same period for all the three research objectives, the description for LNGDP, LNED, LNFDI, LNTO, LNCPI and LNGE are the same as what have been discussed in the previous parts. Overall, the highest mean recorded is for LNED with (4.0731) and the LNFDI the mean was showing -0.6758 though the data is normally distributed. Further, small differences between minimum and maximum values, which indicates the slow and moderate rising of the variables throughout 33 years of observation. Meanwhile, the Skewness value of the log external debt (LNED) and the trade openness (LNTO) tends to be close to 0 while the Kurtosis value of both variables is below 3. This indicates that the two variables tend to be normally distributed and their probability value is not significant.

**Table 5.15:** Descriptive Statistic for Model of Economic Growth

| | LNFDI | LNED | LNGDP | LNGE | LNTO | LNCPI |
|---|---|---|---|---|---|---|
| **Mean** | -0.6758 | 4.0731 | 2.4098 | 2.5041 | 2.2255 | 4.3497 |
| **Median** | -0.5635 | 4.1790 | 2.3873 | 2.5149 | 2.2289 | 4.3372 |
| **Maximum** | 1.7574 | 4.2818 | 2.5351 | 2.8452 | 2.4337 | 4.6052 |
| **Minimum** | 2.8735 | 3.6817 | 2.3713 | 2.2742 | 1.9939 | 4.1531 |
| **Std. Dev.** | 1.2257 | 0.2152 | 0.0460 | 0.1458 | 0.0970 | 0.1243 |
| **Skewness** | 0.0155 | -0.6737 | 1.3023 | 0.1865 | -0.2804 | 0.3390 |
| **Kurtosis** | 2.3536 | 1.8473 | 3.5638 | 2.4605 | 2.9103 | 2.1783 |
| **Observations** | 33 | 33 | 33 | 33 | 33 | 33 |

Testing the stationarity level, the unit Root Test is applied to time series data (Maddala & Kim, 2004). This test begins with Augmented Dickey-Fuller (ADF) test followed by Phillips-Perron (PP) to establish the order of integration of each variable. Table 5.16 presents the outcome of the ADF and PP unit root tests on the natural logarithms of the tested variables (LNFDI, LNED, LNGDP, LNGE, LNHC, LNTO, and

LNFD) for both at levels as well as at first difference. The results suggested that there is a mixture order of integration at I (0) and at I (1) for the variables introduced in the model of economic growth.

**Table 5.16:** ADF and PP Unit Root Tests for Model of Economic Growth

| Level | ADF Unit Root Test | | PP Unit Root Test | |
|---|---|---|---|---|
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNFDI** | -3.2174(0)** | -3.0903(0) | -3.0522(7)** | -2.8837(7) |
| **LNED** | -0.7220(0) | -1.9220(0) | -0.7908(1) | -2.1236(2) |
| **LNGDP** | -3.0001(0)** | -2.5141(0) | -2.9608(1)** | -2.5135(2) |
| **LNGE** | -2.8930(0)* | -2.700(0) | -2.9532(2)* | -2.7574(2) |
| **LNTO** | -2.4016(0) | -3.0775(0) | -2.3525(3) | -2.8532(5) |
| **LNCPI** | -0.9993(0) | -0.9437(0) | -0.9993(0) | -0.7704(3) |
| **First Difference** | **ADF Unit Root Test** | | **PP Unit Root Test** | |
| | **Intercept** | **Intercept and Trend** | **Intercept** | **Intercept and Trend** |
| **LNFDI** | -6.1275(0)*** | -6.1220(0)*** | -8.9561(30)*** | -11.8229(30)*** |
| **LNED** | -4.8287(0)*** | -4.7496(0)*** | -4.8287(0)*** | -4.7496(0)*** |
| **LNGDP** | -4.5308(1)*** | -4.7772(1)*** | -4.5333(0)*** | -4.5876(2)*** |
| **LNGE** | -6.6656(0)*** | -6.3818(0)*** | -6.6508(1)*** | -6.4130(2)*** |
| **LNTO** | -5.7853(0)*** | -5.7065(0)*** | -10.7418(30)*** | -12.8064(30)*** |
| **LNCPI** | -5.0258(0)*** | -5.3880(0)*** | -4.9993(3)*** | -5.4707(6)*** |

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz information criteria for ADF test, and the bandwidth has been selected by using the Newey–West method for the PP test.

Given a mix stationarity found in the previous ADF and PP unit root tests, the author proceed the analysis using more powerful unit root namely KPSS unit root test. Based on Table 5.17 below, it shows that there is a mix stationarity of the variable at I(0) or at I(1). These results fulfil the condition of performing ARDL approach for cointegration of the proposed model.

**Table 5.17:** KPSS Unit Root Tests for Model of Economic Growth

| Variable | KPSS | |
|---|---|---|
| **Level** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.1737(3) | 0.1156(3) |
| **LNED** | 0.5494(5)*** | 0.0989(4) |
| **LNGDP** | 0.2669(4) | 0.1430(4)** |
| **LNGE** | 0.1997(4) | 0.1748(4)*** |
| **LNTO** | 0.5105(3)*** | 0.1460(2)** |
| **LNCPI** | 0.1550(4) | 0.1571(4)** |
| **First Difference** | **Intercept** | **Trend and Intercept** |
| **LNFDI** | 0.5000(31)*** | 0.5000(31)*** |
| **LNED** | 0.0941(1) | 0.0838(1) |
| **LNGDP** | 0.2809(1) | 0.1159(1) |
| **LNGE** | 0.2211(2) | 0.0881(5) |
| **LNTO** | 0.5000(31)*** | 0.5000(31)*** |
| **LNCPI** | 0.3249(3) | 0.1248(9)** |

Note: ***, ** and * are 1%, 5% and 10% of significant levels, respectively.

The approach started with the F-test to confirm the existence of cointegration between the variables in the model. F-test was obtained from the optimum lags based on AIC. AIC-based ARDL as in Table 5.18 suggest that the optimum order was 1,3,4,4,4,4 and the result of F-statistic was greater than its upper bound critical value and significant at 1 level, thus confirming the existence of cointegration in the model.

**Table 5.18:** ARDL Tests for Co-integration for Model of Economic Growth

| Model | | AIC (Lag order) | F Statistic |
|---|---|---|---|
| **LNGDP = F(LNFDI,LNED,LNTO, NGE,LNCPI)** | | (1, 3, 4, 4, 4, 4) | 81.2376*** |
| **Critical Values for F-statistics#** | | **Lower Bound, I (0)** | **Upper Bound, I (1)** |
| **k = 4** | **1%** | 3.41 | 4.68 |
| | **5%** | 2.62 | 3.79 |
| | **10%** | 2.26 | 3.35 |

Note: # The critical values are obtained automatically under Eviews 9, k is several variables (IV), critical values for the bounds test: case III: unrestricted intercept and no trend. *, **, and *** represent 10%, 5% and 1% level of significance, respectively.

It is important that all models are free from econometric problems to make sure that the long run and short run elasticities of the model are valid. This can be done through diagnostic tests as in Table 5.19. Given that the probability values for every single test is greater than 10% significant level, and hence it failed to reject the null hypothesis of no serial correlation, no heteroscedasticity, no misspecification of functional form and the model was normally distributed.

**Table 5.19:** Diagnostic Tests for Model of Economic Growth

| Model | (A) | (B) | (C) | (D) |
|---|---|---|---|---|
| | **Serial Correlation (P-value)** | **Functional Form (P-value)** | **Normality (P-value)** | **Heteroscedasticity (P-value)** |
| **LNGDP = F(LNFDI,LNED,LNTO,LNGE,LNCPI)** | 4.5887 [0.3135] | 1.8109 [0.2119] | 1.5291 [0.4655] | 0.6075 [0.7959] |

Note: The probability values of the battery of Diagnostic tests are presented in squared brackets. A. Lagrange multiplier test for residual serial correlation; B. Ramsey's RESET test using the square of the fitted values; C. Based on a test of skewness and kurtosis of residuals; D. Based on the regression of squared fitted values.

The stability test using CUSUM and CUSUMSQ were as in Figure 5.3. Stability of the model was supported, in all the cases, because the plots of both CUSUM and CUSUMSQ fell inside the critical bounds of five % significance. Therefore, ARDL estimation model for both seem to be appropriate.

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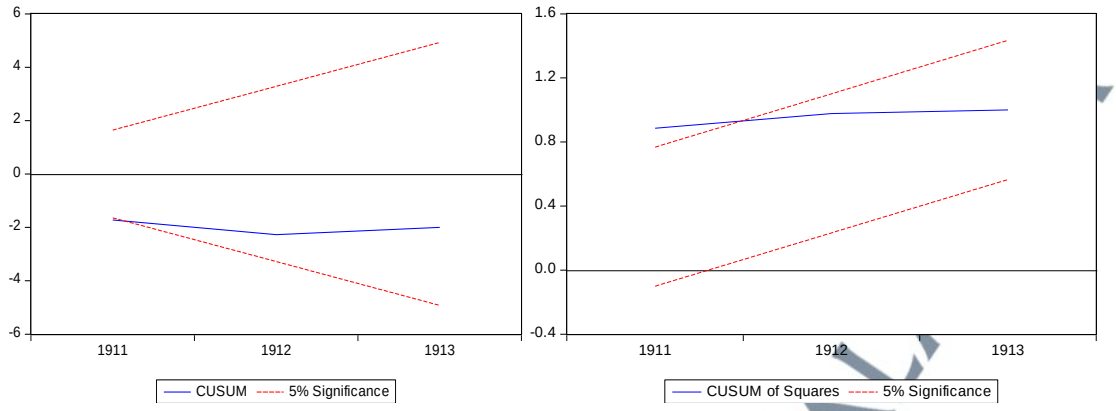


**Figure 5.3:** CUSUM and CUSUMSQ Stability Tests for Model Economic Growth

The ARDL estimation in this research focuses on the impact of FDI, trade openness, government expenditure, external debt and inflation on economic growth in Ottoman Empire between 1881 - 1913. Based on the model of economic growth LNED, LNTO and LNGE have a positive and significant (at 1% and 5% significance level) influence on the growth of Ottoman economy. The remaining variables LNFDI and LNCPI demonstrated a negative and significant impact on the growth of Ottoman economy.

Table 5.20 shows the results of ARDL estimation and it can be seen that LNFDI has a negative and significant effect on the economic growth. This indicates that FDI inflow tends to inhibit domestic economic growth. The coefficient depicts -0.0063 which means that the 1% increase in LNFDI reduced the economic growth by 0.0063%. This result provides support for the prevalence of a foreign direct investment effect having a direct negative impact on growth. It is also noteworthy that Bezuidenhout (2009) has reached to a similar finding whereby FDI in South Africa is found to have a negative effect on economic growth, due to weak linkages and spill over effects.

Using GMM estimators for 14 African countries, Agbloyor et al., (2014) concludes that FDI has a negative impact on economic growth. Indeed, a number of

macroeconomic analyses that were conducted on developed countries report negative impact on growth (Mencinger, 2003; Carkovic & Levine, 2005; Johnson, 2006; Türkcan, Duman & Yetkiner, 2008; Herzer, 2012). The negative impact of FDI on economic growth might be associated with the corruption level either below or above the threshold.

In other words, the higher level of corruption the more FDI inflows are attracted (Akinlabi et al., 2011). This is because the profit-seeking MNEs tend to engage FDI in countries where the jurisdiction is weak and have poor law enforcement. In this regards, the Ottoman economy was corrupted to the maximum and this sort of loophole created many opportunities for European investors to establish certain units that benefited from tax heaven and cheap raw materials. Yet, the FDI inflows did not boost the economic growth and instead it created unhealthy economic environment that negatively affected the economic performance.

Based on the output from this growth model, it is found that LNED has a positive relationship with the economic growth. An increase in LNED by 1% could increase the Ottoman economy growth by 0.05%. Realizing the importance of external debt in driving the economy towards generating wealth has motivated economists to address the linkage between LNED and economic growth. For instance, Slesman et al., (2015) present robust evidence whereby debt inflows have a positive impact on economic growth only in countries with high quality institutions.

This is because institutions tend to mitigate the asymmetric information problems, and they simulate the financial sectors in facilitating the international transactions including borrowing from international bodies. According to Ejigayehu (2013), Zaman & Arslan, (2014), and Soydan & Bedir, (2015) provide empirical evidences confirming that the accumulation of external debt is associated with an increase in economic

growth. More recently, Tanna, (2018) demonstrated a robust evidence that an increasing financial development would probably help to mitigate the negative influence of high external debt on the FDI–growth nexus.

This positive relationship is also found in the study conducted by Jayaraman et al., (2009) on six pacific island major countries, including Tonga, Samoa, Fiji, Solomon Island, Vanuatu and Papua New Guinea. Economic theories propose the notion that a reasonable level of debt is push factor in achieving economic growth. Yet, these theories posit that higher public debt levels could harm the economic growth. According to Kharusi & Ada, (2018) the main risk associated with higher external loans is the difficulties in meeting the repayment deadline which in turn makes the cost of borrowing more expensive. Ottoman Economy was facing the same challenges and although the result shows a positive sign but the consequences of excessive demand of external loans. Hence, the state lost the sovereignty and the borrowers became the decision makers of the economy through OPDA.

The rise of openness to trade (LNTO) has also led to a higher economic growth in OE. The magnitude of 0.3163. A large number of studies discuss the level of interaction between trade openness and other macroeconomic factors in general and economic growth in particular (Belloumi, 2014; Dollar & Kraay, 2003; El Khoury & Savvides, 2006; Eris. & Ulaşan, 2013; Hakimi & Hamdi, 2016). It is widely accepted among the researchers that trade openness has a positive link with economic growth (Squalli & Wilson, 2011; Nguyen et al., 2018; Naveed & Shabbir, 2006).

More recently, Nguyen et al., (2018) analysed a data of 33 emerging economies between 2002 and 2015. Their findings were in line with the prior research where a positive linkage was identified. Such outputs are theoretically supported in the theory of growth. Romer, (1992), Grossman & Helpman, (1991), and Sala-i-Martin & Barro,

(1995) hold the idea that countries that are more opened to the rest of the world have a better chance in absorbing more technological advances skills and tools. Hence, a higher trade openness is more likely to stimulate the performance of an economy, as the state would be able to generate more revenues through tax mechanism.

Precisely, the Ottoman economy the 19th century was a remarkable century for OE in the sense of rapid integration into the world economy. The foreign trade had expanded more than tenfold with 13% of the Ottoman products allocated for exportation. Issawi, (1995) makes mention that the OE trade regime was relatively liberal compared to other economies. He added that the British controlled the Ottoman foreign trade starting from year of Anglo-Ottoman treaty 1838 to the 1860s. With that in mind, it is seems that the trade openness has a positive long-run relationship with economic growth and this is an interesting result that provide a different insights on the performance of Ottoman economy during a critical period.

In the case of government expenditure (LNGE), the result revealed a positive and significant sign in which 1% increase in LNGE could increase the LNGDP by 0.25%. Similar finding is found in the existing literature. For instance, Olugbenga & Owoye, (2007) demonstrate a long run the relationship between government expenditure and economic growth for a group of 30 countries during the period of 1970-2005. In Nigeria, Samuel & Kabir, (2011) studies the implications of government spending on the economic growth over the period 1980 – 2009. The outcomes show a positive association between government expenditure and economic growth.

In Asia, Lahirushan & Gunasekara, (2015) exhibit a unidirectional causality from economic growth to government expenditure and government expenditure to economic growth. More importantly, the Keynesian economics approach predicts the fact that the government expenditure should ultimately lead to economic growth. They further argue

that economic growth might be happening when there is a rising in public sector expenditure. The positive correlation between government expenditure and economic growth is recognized in the Wagner's Law, which assumes role of the government increases because of economic growth. Based on the above discussion, the figures show that Ottoman economy was receiving consistent amounts that to a certain extent boosted the economic growth.

Lastly, the inflation (LNCPI) presents a significant and negative relationship with economic growth. Given inflationary pressures, the key areas of policy concern of economic policies is to foster growth and maintain a low level of inflation (Baharumshah et al., 2016). More importantly, De Gregorio, (1993) listed a number of the undesirable consequences of inflation 1) can increase the cost of capital, 2) reducing capital accumulation 3) lowering its productivity. Indeed, all school of economic thought discourages the accelerating inflation for its undesirable re-distributional and welfare effects (Eggoh & Khan, 2014). At the empirical level, the studies conducted in the last few decades tend to reaffirm the fact that inflation has a negative and nonlinear impact of inflation on the economic growth.

For instance, Gillman et al., 2004; Rousseau & Wachtel, 2001; Sachsida et al., 2003 posit a negative inflation-growth effect. Some researchers attempt to suggest a permissible threshold for the inflation rate such as: Yilmazkuday, (2013) 10%, Barnes & Duquette, (2006) 13% and 14% Rousseau & Yilmazkuday, (2009) 4% and 19%. For Ottoman economy, Berument & Gunay, (2007) highlighted two main sources of the occurred inflation in OE, which are 1) fiscal expansion 2) war accelerated inflation. The study also suggests that each ruler tends to accelerate inflation in the first year of his reign through the debasement. Thus it is evident that the inflation was having a negative association with economic growth as it is proven in the below long run elasticities.

**Table 5.20:** Long-Run Elasticities for Model Economic Growth

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **LNFDI** | -0.0063** | -5.5978 | 0.0113 |
| **LNED** | 0.0518** | 3.5947 | 0.0369 |
| **LNTO** | 0.3163*** | 6.2438 | 0.0083 |
| **LNGE** | 0.2539*** | 17.0072 | 0.0004 |
| **LNCPI** | -0.3765*** | -11.3664 | 0.0015 |
| **C** | 2.4739 | 24.6649 | 0.0001 |

(*), (**), (***) indicate significant at 10%,5% and 1% significant level.

The mentioned nexus are investigated in the short run elasticities and the finding are slightly different from the long run. Table 5.21 presents the result of this test. LNFDI was showing a positive and significant association with economic growth around 0.005% and this contradicts earlier reported result. Not only LNFDI but also LNED in which the outcomes present a non-significant relationship. Similarly, the government expenditure LNGE depicts a similar finding whereby a nonlinear relationship is detected at 0.0489%. For LNTO, the result is consistent with the long run in which the trade openness is positively correlated with the economic growth. Lastly, the inflation LNCPI indicated a negative and significant relationship with economic growth and such output matches with the long run finding.

In addition to that, Table 5.21 provides the estimated lagged error correction term (ECT) in ARDL. The ECT appears to be negative and statistically significant. A higher value of coefficient represents the higher speed of adjustment for the variables to converge in the long run. Next, the size of the R-square indicated a good fit in all the models with almost 98% and above of the variables in equations explained the dependent variable (LNGDP).

**Table 5.21:** Short Run Elasticities and Error Correction Term for Model of Economic Growth

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| **D(LNFDI)** | 0.0047 | 3.0092 | 0.0572 |
| **D(LNFDI(-1))** | 0.0043 | 3.8697 | 0.0305 |
| **D(LNFDI(-2))** | 0.0094 | 6.1165 | 0.0088 |
| **D(LNED)** | -0.0137 | -1.2232 | 0.3086 |
| **D(LNED(-1))** | 0.1406 | 6.3628 | 0.0079 |
| **D(LNED(-2))** | 0.0865 | 3.1906 | 0.0497 |
| **D(LNED(-3))** | -0.3221 | -12.4531 | 0.0011 |
| **D(LNTO)** | 0.1223 | 5.3989 | 0.0125 |
| **D(LNTO(-1))** | -0.1741 | -6.4069 | 0.0077 |
| **D(LNTO(-2))** | -0.0156 | -0.8678 | 0.4493 |
| **D(LNTO(-3))** | -0.0175 | -0.8537 | 0.4560 |
| **D(LNGE)** | 0.0489 | 1.3789 | 0.2617 |
| **D(LNGE(-1))** | -0.0927 | -5.1434 | 0.0142 |
| **D(LNGE(-2))** | -0.0924 | -4.9381 | 0.0159 |
| **D(LNGE(-3))** | -0.0833 | -3.3598 | 0.0437 |
| **D(LNCPI)** | -0.1780 | -6.0296 | 0.0091 |
| **D(LNCPI(-1))** | 0.0269 | 0.7782 | 0.4932 |
| **D(LNCPI(-2))** | 0.1302 | 5.3026 | 0.0131 |
| **D(LNCPI(-3))** | 0.0577 | 2.7966 | 0.0680 |
| **ECT(-1)** | -1.5487 | -19.8757 | 0.0003 |
| **R-squared** | 0.998816 | 101.2141 | |
| **Adjusted R-squared** | 0.988947 | 0.001384 | |

Dependent variable is DLNGDP. (*), (**), (***) indicate significant at 10%, 5% and 1% significant level.

## 5.5 Summary

This chapter mainly provides a discussion on the three proposed models that shape the entire framework of this thesis. Firstly, the findings of the FDI's model show a negative correlation with economic growth and external debts. This contradicts the prior research, which support the positive association between FDI and economic growth. The second model presents the outputs of external debt as a dependent variable. In this model, the result indicated that all the variables are significant except the FDI, which

show a non-significant linear relationship. In the last model, the economic growth provide an interesting finding as all the variables posit a significant relationship with economic growth which functions as dependent variable. The result of this model is also supported by the prior studies. It is important to mention here that the used data in this study is related to the last two centuries and despite of such historical timeframe, the findings of this study manage to provide results that match with the most recent studies. This provide concrete evidences on the reliability of the gathered data and its strength in supplying worthy results.

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