TABLE OF CONTENTS

CHAPTER FOUR: ANALYSIS AND RESULTS

4.1. Introduction

The present chapter is designed for the presentation of analysis and results which have been tested in this research. Furthermore, the chapter has incorporated a brief discussion on the test conducted in the favour of this study which includes Augmented Dickey Fuller test, Autocorrelation and Least Square Estimates. However, for this research, the researcher has collected secondary data in order to acquire data relevancy for the statistics of immigrants in the UK and GDP growth rate. After the interpretation of the results, the chapter also incorporated a detailed discussion on the objectives of the study.

4.2. Data Analysis

4.2.1. Augmented Dickey Fuller (ADF)

The ADF test is applied to test whether there is unit root in the data set or not and to check whether the data is stationary. Moreover, the ADF test also interprets the null hypothesis which Demand follows the unit root process. The stationary test enables the researcher to verify whether the series is stationary or not. Furthermore, the data in this research has been generated by utilising the data on the GDP growth rates of the UK. The table below explains the ADF test for the research.

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.747789	0.0075
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP_GROWTH)
Method: Least Squares
Date: 08/10/17 Time: 12:59
Sample (adjusted): 1981 2015
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_GROWTH(-1)	-0.521646	0.139188	-3.747789	0.0007
C	1.240816	0.410970	3.019237	0.0049

R-squared	0.298558	Mean dependent var	0.124657
Adjusted R-squared	0.277302	S.D. dependent var	1.970812
S.E. of regression	1.675420	Akaike info criterion	3.925449
Sum squared resid	92.63201	Schwarz criterion	4.014327
Log likelihood	-66.69537	Hannan-Quinn criter.	3.956130
F-statistic	14.04592	Durbin-Watson stat	1.800894
Prob(F-statistic)	0.000684		

From the table presented above, it can be interpreted that the ADF test showed that there is no unit root in the data set and data for GDP growth is stationary. This is because the null hypothesis indicates that GDP growth rate has a unit root and the probability value being less than 0.05 indicating that null hypothesis is rejected and data is stationary. The null hypothesis for this test stated that data contains a unit root which means that data is not stationary. The significance value, in this case, was 0.007 which is lower than 0.05 representing that null hypothesis of study has been accepted and also that the data set within the table contains a unit root which is the reason that the null hypothesis is rejected.

From the table above, it can also be interpreted that the R-square is estimated at 0.29, whereas, the adjusted R-squared is estimated at 0.27 representing a weak correlation in the variable of the study. In addition, the value of Durbin Watson is estimated at 1.80 which reflects that there is no autocorrelation in the sample taken for the test as the test reflects the autocorrelation in the residuals forms the ADF test analysis.

Null Hypothesis: NET_MIGRATION has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.760814	0.8177
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NET_MIGRATION)
Method: Least Squares
Date: 08/10/17 Time: 13:01
Sample (adjusted): 1981 2015
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NET_MIGRATION(-1)	-0.047189	0.062025	-0.760814	0.4522
C	16477.42	9863.043	1.670622	0.1043

R-squared	0.017238	Mean dependent var	11085.71
Adjusted R-squared	-0.012542	S.D. dependent var	40331.25
S.E. of regression	40583.39	Akaike info criterion	24.11555
Sum squared resid	5.44E+10	Schwarz criterion	24.20443
Log likelihood	-420.0221	Hannan-Quinn criter.	24.14623
F-statistic	0.578838	Durbin-Watson stat	1.803236
Prob(F-statistic)	0.452171		

The second test is for net migration where the null hypothesis is that net migration has a unit root. In this case, the null hypothesis is accepted because the probability value is greater than 0.05 at 0.81 and thus, the data is not stationary and contains a unit root. Since the value of the

probability is estimated at 0.81, therefore, there is no sign of the null hypothesis which is the reason it is rejected in this study. Furthermore, the results also highlight that the Net Migration in the test has a unit root. In the results, the p-value is greater than the significance level, where alpha= 0.05, therefore, the null hypothesis should be accepted while rejecting the null hypothesis.

Null Hypothesis: UNEMPLOYMENT_RATE has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.422887	0.1432
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMPLOYMENT_RATE)
Method: Least Squares
Date: 08/10/17 Time: 13:02
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMPLOYMENT_RATE(-1)	-0.123593	0.051011	-2.422887	0.0214
D(UNEMPLOYMENT_RATE(-1))	0.608290	0.119629	5.084818	0.0000
C	0.857231	0.414832	2.066451	0.0472

R-squared	0.470299	Mean dependent var	-0.127941
Adjusted R-squared	0.436124	S.D. dependent var	0.839795
S.E. of regression	0.630616	Akaike info criterion	1.999859
Sum squared resid	12.32798	Schwarz criterion	2.134538
Log likelihood	-30.99760	Hannan-Quinn criter.	2.045788
F-statistic	13.76176	Durbin-Watson stat	1.813854
Prob(F-statistic)	0.000053		

For the unemployment rate, the ADF test was conducted to test the unit root. The results showed that data is not stationary and contains a unit root because the null hypothesis is accepted with p-value being greater than 0.05 acceptable values at 0.14. Similar to the previous results, the

Durbin Watson for this research is estimated at 1.81 which depicts that there is no autocorrelation in the unemployment data.

4.2.2. Autocorrelation

The autocorrelation test is to test the seasonality and presence of serial correlation in the data set. This has been applied to all three variables of GDP growth rate, net migration and unemployment rate. The autocorrelation test helps in observing the time lags between the observations and the variables of the study. The rest is interpreted as follows.

Date: 08/10/17 Time: 12:57
Sample: 1980 2015
Included observations: 36

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |****** |	. |****** |	1	0.857	0.857	28.719	0.000
. |***** |	.*| . |	2	0.696	-0.147	48.193	0.000
. |***** |	. |** |	3	0.626	0.261	64.415	0.000
. |**** |	. |*. |	4	0.611	0.122	80.394	0.000
. |**** |	. | . |	5	0.580	-0.011	95.253	0.000
. |**** |	. | . |	6	0.513	-0.050	107.27	0.000
. |*** |	. | . |	7	0.441	-0.032	116.45	0.000
. |*** |	.*| . |	8	0.374	-0.077	123.28	0.000
. |** |	.*| . |	9	0.297	-0.119	127.75	0.000
. |** |	. | . |	10	0.233	-0.010	130.60	0.000
. |*. |	**| . |	11	0.138	-0.226	131.64	0.000
. | . |	.*| . |	12	0.034	-0.100	131.71	0.000
. | . |	.*| . |	13	-0.049	-0.067	131.85	0.000
.*| . |	.*| . |	14	-0.110	-0.070	132.61	0.000
.*| . |	. |*. |	15	-0.137	0.090	133.82	0.000
.*| . |	.*| . |	16	-0.192	-0.131	136.35	0.000

The results show that there is no serial autocorrelation and data for net migration is not seasonal with a p-value at all levels of lags being 0.000 less than 0.05 indicating no serial correlation.

Date: 08/10/17 Time: 12:58
Sample: 1980 2015
Included observations: 36

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |****** |	. |****** |	1	0.891	0.891	31.047	0.000
. |***** |	***| . |	2	0.709	-0.413	51.300	0.000
. |**** |	. | . |	3	0.528	0.013	62.845	0.000
. |*** |	. | . |	4	0.373	-0.007	68.803	0.000
. |** |	. |* . |	5	0.268	0.086	71.974	0.000
. |* . |	. | . |	6	0.210	0.040	73.977	0.000
. |* . |	. |* . |	7	0.196	0.100	75.795	0.000
. |* . |	.*| . |	8	0.180	-0.145	77.384	0.000
. |* . |	. | . |	9	0.162	0.066	78.721	0.000
. |* . |	.*| . |	10	0.122	-0.141	79.500	0.000
. | . |	**| . |	11	0.027	-0.226	79.540	0.000
.*| . |	. | . |	12	-0.076	0.048	79.869	0.000
.*| . |	. | . |	13	-0.160	-0.005	81.384	0.000
**| . |	. | . |	14	-0.217	-0.061	84.299	0.000
**| . |	.*| . |	15	-0.256	-0.074	88.585	0.000
**| . |	.*| . |	16	-0.283	-0.073	94.060	0.000

The data for unemployment rate shows that there is no serial correlation because of probability value being 0.000 less than 0.05 and thus, it can be concluded that data is not a season which is also denoted by an asterisk (*) in the output because of no significant fluctuations.

Date: 08/10/17 Time: 12:58
Sample: 1980 2015
Included observations: 36

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |****** |	. |****** |	1	0.891	0.891	31.047	0.000
. |***** |	***| . |	2	0.709	-0.413	51.300	0.000
. |**** |	. | . |	3	0.528	0.013	62.845	0.000
. |*** |	. | . |	4	0.373	-0.007	68.803	0.000
. |** |	. |* . |	5	0.268	0.086	71.974	0.000
. |* . |	. | . |	6	0.210	0.040	73.977	0.000
. |* . |	. |* . |	7	0.196	0.100	75.795	0.000
. |* . |	.*| . |	8	0.180	-0.145	77.384	0.000
. |* . |	. | . |	9	0.162	0.066	78.721	0.000
. |* . |	.*| . |	10	0.122	-0.141	79.500	0.000
. | . |	**| . |	11	0.027	-0.226	79.540	0.000
.*| . |	. | . |	12	-0.076	0.048	79.869	0.000
.*| . |	. | . |	13	-0.160	-0.005	81.384	0.000
**| . |	. | . |	14	-0.217	-0.061	84.299	0.000
**| . |	.*| . |	15	-0.256	-0.074	88.585	0.000
**| . |	.*| . |	16	-0.283	-0.073	94.060	0.000

The third test for autocorrelation is for GDP growth rate and it is concluded that there is no seasonality in data and no serial correlation exists because of p-value being 0.000 less than 0.05.

4.2.3. Least Square Estimate

Dependent Variable: GDP_GROWTH
Method: Least Squares
Date: 08/10/17 Time: 13:10
Sample: 1980 2015
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.386309	2.224199	0.623284	0.5374
NET_MIGRATION	1.04E-06	4.35E-06	0.238883	0.8127
UNEMPLOYMENT_RATE	0.081312	0.231247	0.351624	0.7274

R-squared	0.003743	Mean dependent var	2.141194
Adjusted R-squared	-0.056636	S.D. dependent var	2.034665
S.E. of regression	2.091489	Akaike info criterion	4.393285
Sum squared resid	144.3528	Schwarz criterion	4.525245
Log likelihood	-76.07914	Hannan-Quinn criter.	4.439343
F-statistic	0.061992	Durbin-Watson stat	0.915199
Prob(F-statistic)	0.940000		

The third test conducted is a least square estimate to determine the impact of net migration and unemployment on GDP growth rate. The least square method helps in estimating the parameter values within the research as it minimises the sum of the squares of the deviations of the theoretical points and the residuals are presented in the table. The test indicated that unemployment and net migration insignificantly impact the GDP growth rate because of p-value is greater than 0.05. The independent variables do not cause variability in dependent variable due to the probability of f-stats being higher than 0.05.

4.3. Discussion

Objective 1: To study the concepts of Immigration and Economic Development from a theoretical perspective.

The first objective of the research is aimed towards understanding the concepts of the economic development and immigration from the theoretical perspective. As the objective was in nature of theory, therefore, the researcher reviewed several articles and concepts as presented by the previous researchers by assessing different articles and journals. According to the research conducted by Peri (2012), the debate related to the migration policy has been severely discussed both in the political class and in public opinion. However, the previous researchers have carried out different economic studies for aiding their arguments regarding the concept of immigration and its impact on the economic development. In the light of Borjas (2013), it is crucial for the country if they are increasing their number of immigrants because employment opportunities have to be provided to the expatriates equally alongside the national residents of the country. However, the concept of immigration and the economic development moves hand in hand in the previous literature and also had been widely discussed by the authors and practitioners.

Objective 2: To identify key factors that lead towards the economic development of a country.

The objective stated above is directed towards the identification of the key factors which lead towards the economic development of the country. Since this objective is also theoretical in nature, therefore, the researcher successfully completed the objective by reviewing past theories and concepts that have been given in the light of different authors and practitioners. According to the research carried out by Ottaviano and Peri (2012), there is a 10% increase in the share of

immigrants in the labour force that mainly reduces Aboriginal wages which are less than one percentage point. In the light of Dustmann, Frattini and Preston (2012), the migration does not only imply the movement of the cultures and the successful assimilation for the destination country required the migrants to the interaction with the society and adapts to the culture present in the country.

In addition to the above statement, there is a significant importance of the integration of the immigrants and hence supports the formation and creation of the new multicultural identity. It was further stated by Bond, Iwasa and Nishimura (2013), that there could be strong competition for the jobs which can result in the loss of income for indigenous workers in the country of destination, especially if newly arrived workers are comparatively more expert than those in the host country. Therefore, the effective provision of the employment opportunities, decrease in the income and consumption patterns of the consumers in the country can lead to the economic development of the country.

Objective 3: To assess the impact of immigration on the economic development (GDP Growth Rate) of UK.

The third objective of the research was directed towards the assessment of the impact of immigration on the economic development of the UK. The objective was successfully achieved by the researcher by testing the impact of the immigration on the economic development within the context of the GDP growth rate of the UK. It was identified that populations within the host countries mainly relies on organized immigration in order to address gaps in their labour markets and hence meet a number of demographic needs for the purpose of offsetting low fertility rates, aging of the population, a growing dependency on the elderly, a decline in the labour force and high emigration rates. However, the test results depicted that there is no unit

root in the data set and data for GDP growth is stationary. Therefore, in this case, the probability value of the results was estimated at 0.007 which is lower than 0.05 representing that null hypothesis of study has been accepted.

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