Journal of Advances in Economics and Finance, Vol. 5, No. 3, August 2020
https://dx.doi.org/10.22606/jaef.2020.53001 

# Chile's Trade Patterns

OBAMBI Chardel Cardorel[1], GNOMBLEROU Edna[2], ANOUBA Acha Arnaud Martial[3]

[1] School of Economics, Shandong University, Jinan, China
[2] School of International Education, GuangXi University of Finance and Economics, Nanning, China
[3] School of business, Hohai University, China
Email: [1] chardelobambi@outlook.com, [2] gnomblerou_edna@yahoo.fr, [3] arnaudanouba@gmail.com

**Abstract.** The paper comprehensively and candidly analyzes the tendency and direction of imports and exports of Chile by employing a time series analysis for data ranging from the year 1990 to 2018. The paper analyzed the patterns of the imports, exports and balance trade and consequently predict the growth rates that Chile has witnessed in the past 29 years. The regression model will be employed to compound the growth rates which will help in forecasting the trend of subsequent imports and exports. The results show that both imports and exports have been increasing and decreasing alternatively. The seasonality was observed to be for a cycle of 5 years. However, the last two years reveal that the exports and imports have been experiencing upward curve. The regression model is employed to determine the constant and the slope of the imports, exports and balance of trade upon which forecasts can be made for subsequent years. The results from the moving averages and linear regressions of individual models have revealed that the country is going to experience a decrease in imports and exports in the near future due to its seasonal cycle pattern.

**Keywords:** imports, exports, trade balance, trends, Chile

## 1 Introduction

Chile is the forty-five second biggest fare economy on the planet and the sixty-first most complex economy as indicated by the Economy Complexity Index (ECI). Chile has an open economy which depends mostly on international trade. It is estimated that the international trade accounted for 57.5% of its Gross Domestic Product in 2018, which was a surge from 2017. Chile is amongst the leading producers and distributors of various merchandises such as Fish, Ores, Copper, Fruits, Wood, Beverages, and fruits. On the other hand, it imports cars, crude petroleum, and refined petroleum. The country plays a critical role in the global economy and its commercial benefits are anticipated to scale up due to the increase in the demand for agricultural products and minerals. The exporting partners of Chile are; Japan, United States, China while its importing partners are Brazil, United States and China. China singed a Free Trade Agreements with various vital economies notably South Korea, European Union, China, and United States. The country is also a member of Pacific Alliance with Colombia, Mexico, and Peru since 2012. Additionally, the country signed a trade continuity agreement with United Kingdom during the Brexit uncertainties in order to secure a continuous trade relation. However, the challenges to its trade include replacement of the failed Union of South American Nations with Prosur in order to enhance the economic amalgamation and trade relations in the region.

This research aims at examining the growth in trends or patterns in Chile's imports and exports. An in-depth focus has been put on imports and exports since they place a critical role in determining the balance of trade and Gross Domestic Product of a country. Another vital aspect of this study is to forecast Chile's imports and exports in order to have a clear picture of what is expected in the country's economy. The information of the trade balance, imports and exports is crucial since it determines the future policies concerning the international trade, and realizing targeted growth rates. Additionally, the information help decision makers and other relevant authorities in making year plans, planning budgets, making foreign policies in order to circumvent any potential negative situation in future.

The remaining part of the paper is structured in the following manner; Review of relevant literature, methodology, explanation of data background concerning the pattern of Chile's intercontinental trade and discussion of empirical results. The paper ends with conclusion.

 

## 2 Review of Relevant Literature

For several years, the global economy has fully-fledged and shifted with an upscale of production and commercial goods and services. State trade policies have concentrated on the decrease of transnational barrier have significantly contributed to this increase in the production components and tradable goods (Al-Zyoud & Elloumi, 2017). The advancement of technology has led to increase in the production of goods and services due to economies of scale; this has resulted to a decrease in the prices of good. Consequently, the transportation, development of tradable goods and communication to be relatively cheaper. The Chile percentage of this increasing trade with other developing nations has significantly surged due to the increase trade agreements with other nations. As a result of this faster growth, its growth rate has been faster compared to gross yield of goods or Gross Domestic Product.

Nevertheless, to fully understand the relationship between Gross production of Goods and GDP, it is essential to comprehend the explicit impact of imports-exports on the economy of a nation. This is important because Gross Domestic Product is normally discoursed in correlation to the economy-wide revenues and utilized by the governments in supporting initiation of policies (Bas, & Strauss-Kahn, 2014). The growth of imports and exports have a positive impact to the country's national gross product. A growth in GDP leads to price stability, increase in employment and reduce inflation. It is therefore, important for a country to establish its future imports, exports and balance of trade in order to make policies that are helpful to the economy. The research by Vollaard (2014) established that disintegration of European industries due to internationalized trade contributes to the phenomenon where exports rise while their values that are added to the national production is little.

Though, the existing literature seem not to generate a consensus regarding the existence of such kind of relationship. Study by Al-Zyoud and Elloumi (2017) established that trade openness is straightly related to several commercial goods of a state economy and goes past the fundamental resource areas such as natural gas, mining, stone and crude oil to manufacturing sector. Chile's focus on exports to United Kingdom amid of Brexit resulted to loss of consideration basis in fast growing markets in European union and as a result, Chile's total trade is probable to have insignificant straight impact on trade terms in markets. Box and Jenkins (2015) have supported this sentiment after conducting a research on how a country's import is not as important as its exports. Contrary, Shahbaz (2012) conducted his study by use of Cobb-Douglas function of production in combination with VECM Granger causativeness method and he established that open trade has a positive influence towards a country's growth in economy and protects an business from external risks. Fundamentally owing to the reality that several studies used dissimilar econometric methods in testing the correlation leading to varied results. Further macroeconomic analysis is required to solve the predicament between methodology and results.

Hruzova, Rypka, and Hron (2017) used Log-ratio statistical method to analyze the pattern of trade flows. Their study differentiated labor and capital relative to value addition, disintegrating trade statistics on production components and exported products. However, this study will use moving averages and regression models to establish the patterns. Mukhtar and Rasheed (2010) conducted a research on imports and exports in Pakistan. His research affirmed the fact that several literatures focused on long-run correlation between methodology and results hence, resulting to the inconsistencies witnessed.

## 3 Data and Methodology

For accurate analysis of the pattern of Chile's trade, the aggregate imports and exports were computed using the present market prices. Table 1 below shows Chile's imports and exports from 2014 to 2018 in USD million.

 

**Table 1.** The import, export and balance of trade of Chile from 1990 to 2018

| Year | Import | Export | Balance of Trade |
|---|---|---|---|
| 1990 | 7022279 | 8522024 | 1499745.28 |
| 1991 | 7452625 | 8960062 | 1507437.05 |
| 1992 | 9455495 | 9913289 | 457793.53 |
| 1993 | 10541862 | 9308256 | -1233605.63 |
| 1994 | 11149066 | 11368678 | 219612.16 |
| 1995 | 14903049 | 15901137 | 998087.68 |
| 1996 | 16809974 | 15406822 | -1403151.36 |
| 1997 | 18110804 | 16678189 | -1432614.91 |
| 1998 | 17082406 | 14841618 | -2240787.46 |
| 1999 | 13891478 | 15619179 | 1727701.51 |
| 2000 | 16619726 | 18214504 | 1594777.77 |
| 2001 | 16136155 | 18745415 | 2609259.16 |
| 2002 | 15383398 | 17423088 | 2039690.03 |
| 2003 | 19245178 | 21650906 | 2405727.5 |
| 2004 | 24714538 | 33025407 | 8310869.12 |
| 2005 | 32926775 | 41972988 | 9046213.59 |
| 2006 | 58829357 | 60596328 | 1766970.49 |
| 2007 | 47596990 | 68560429 | 20963439.73 |
| 2008 | 62793574 | 64507601 | 1714027.59 |
| 2009 | 42844129 | 55458960 | 12614830.73 |
| 2010 | 59007358 | 71106106 | 12098748.24 |
| 2011 | 74848007 | 81437589 | 6589582.68 |
| 2012 | 80085757 | 78062995 | -2022762.15 |
| 2013 | 79347346 | 76766729 | -2580616.48 |
| 2014 | 72849514 | 75083497 | 2233983.37 |
| 2015 | 62386717 | 62033060 | -353656.55 |
| 2016 | 59352044 | 60717528 | 1365484.07 |
| 2017 | 65257276 | 68858402 | 3601125.94 |
| 2018 | 74187323 | 75481714 | 1294390.54 |

## 4. Analysis

Table 1 shows the trend of import, export and Balance of trade from 1990 to 2018. The trend line from the graph above shows that both export and import in the first decade (1990-1999) was low as compared to the import and exports in the second decade (2000 to 2009). However, the highest import and exports were witnessed in the beginning of the third decade (2010-2018). As it can be observed, the highest import was in 2012 where the country's imports rose to $80,085,757 while the highest export figure was witnessed in 2011 whereby the export figure was $81,437,589. This shows that the country's exports and imports have exhibited a positive and upward trend. On the other hand, the balance of trade remained low during the forecasted period due to positive correlation between the exports and imports. It should be noted that the balance of trade is computed by subtracting the imports from the export.

### 4.1 Import, Export and Balance of Trade Forecast

The research used moving average to predict the exports, imports and balance of trade in subsequent year 2019, 2020 and 2021. The first technique of moving average that was used is two year moving average which is used to predict either the export, import or balance of trade of the subsequent year. The predictions were as follows.

 

**Table 2.** Forecast for imports using two, three- and four-year moving averages.

| Year | Import | Imports 2YMA | Imports 3YMA | Imports 4YMA |
|---|---|---|---|---|
| 1990 | 7022279 | | | |
| 1991 | 7452625 | | | |
| 1992 | 9455495 | 7237452.035 | | |
| 1993 | 10541862 | 8454060.29 | 7976799.747 | |
| 1994 | 11149066 | 9998678.53 | 9149994.157 | 8618065.283 |
| 1995 | 14903049 | 10845464.07 | 10382141.1 | 9649762.178 |
| 1996 | 16809974 | 13026057.73 | 12197992.45 | 11512368.13 |
| 1997 | 18110804 | 15856511.49 | 14287363.07 | 13350987.78 |
| 1998 | 17082406 | 17460388.87 | 16607942.32 | 15243223.3 |
| 1999 | 13891478 | 17596604.93 | 17334394.54 | 16726558.21 |
| 2000 | 16619726 | 15486941.72 | 16361562.47 | 16473665.29 |
| 2001 | 16136155 | 15255601.77 | 15864536.48 | 16426103.35 |
| 2002 | 15383398 | 16377940.67 | 15549119.63 | 15932441.2 |
| 2003 | 19245178 | 15759776.75 | 16046426.5 | 15507689.26 |
| 2004 | 24714538 | 17314288.15 | 16921577.22 | 16846114.41 |
| 2005 | 32926775 | 21979858.01 | 19781038.05 | 18869817.38 |
| 2006 | 58829357 | 28820656.36 | 25628830.29 | 23067472.25 |
| 2007 | 47596990 | 45878065.98 | 38823556.6 | 33928961.99 |
| 2008 | 62793574 | 53213173.32 | 46451040.5 | 41016914.84 |
| 2009 | 42844129 | 55195281.67 | 56406640.15 | 50536673.82 |
| 2010 | 59007358 | 52818851.54 | 51078230.87 | 53016012.43 |
| 2011 | 74848007 | 50925743.45 | 54881686.9 | 53060512.56 |
| 2012 | 80085757 | 66927682.13 | 58899831.18 | 59873266.84 |
| 2013 | 79347346 | 77466881.78 | 71313707.06 | 64196312.61 |
| 2014 | 72849514 | 79716551.4 | 78093703.15 | 73322116.77 |
| 2015 | 62386717 | 76098429.74 | 77427538.79 | 76782655.76 |
| 2016 | 59352044 | 67618115.27 | 71527858.81 | 73667333.34 |
| 2017 | 65257276 | 60869380.57 | 64862758.24 | 68483905.15 |
| 2018 | 74187323 | 62304659.92 | 62332012.26 | 64961387.59 |
| 2019 | | 69722299.47 | 66265547.7 | 65295840.02 |
| 2020 | | | 46481532.98 | 49699160.78 |

Four year moving average is the best prediction technique for 2019, 2020 and 2021

Import forecast for 2019 = (62386717+59352044+65257276+74187323)/4=$65,295,840.02

Import forecast for 2020 = (59352044+ 65257276+ 74187323)/4=$49,699,160.78

**Table 3.** Exports forecast using two, three, and four moving averages

| Year | Import | Imports 2Y MA | Imports 3YMA | Imports 4YMA |
|---|---|---|---|---|
| 1990 | 8522024 | | | |
| 1991 | 8960062 | | | |
| 1992 | 9913289 | 8741043.2 | | |
| 1993 | 9308256 | 9436675.58 | 9131791.7 | |
| 1994 | 11368678 | 9610772.48 | 9393869.14 | 9175907.84 |
| 1995 | 15901137 | 10338467.33 | 10196741.12 | 9887571.455 |
| 1996 | 15406822 | 13634907.65 | 12192690.52 | 11622840.07 |
| 1997 | 16678189 | 15653979.65 | 14225545.9 | 12996223.49 |
| 1998 | 14841618 | 16042505.73 | 15995382.79 | 14838706.69 |

 

| Year | Import | Imports 2Y MA | Imports 3YMA | Imports 4YMA |
|---|---|---|---|---|
| 1999 | 15619179 | 15759903.75 | 15642209.96 | 15706941.7 |
| 2000 | 18214504 | 15230398.75 | 15712995.52 | 15636452.24 |
| 2001 | 18745415 | 16916841.41 | 16225100.42 | 16338372.58 |
| 2002 | 17423088 | 18479959.14 | 17526365.78 | 16855178.94 |
| 2003 | 21650906 | 18084251.35 | 18127668.82 | 17500546.38 |
| 2004 | 33025407 | 19536996.92 | 19273136.11 | 19008478.03 |
| 2005 | 41972988 | 27338156.32 | 24033133.6 | 22711203.83 |
| 2006 | 60596328 | 37499197.71 | 32216433.69 | 28518097.31 |
| 2007 | 68560429 | 51284658.02 | 45198241 | 39311407.17 |
| 2008 | 64507601 | 64578378.43 | 57043248.43 | 51038788.07 |
| 2009 | 55458960 | 66534015.33 | 64554786.08 | 58909336.67 |
| 2010 | 71106106 | 59983280.7 | 62842330.22 | 62280829.57 |
| 2011 | 81437589 | 63282532.93 | 63690889.08 | 64908274.13 |
| 2012 | 78062995 | 76271847.59 | 69334218.4 | 68127564.15 |
| 2013 | 76766729 | 79750292.05 | 76868896.65 | 71516412.49 |
| 2014 | 75083497 | 77414862.09 | 78755771.17 | 76843354.84 |
| 2015 | 62033060 | 75925113.18 | 76637740.37 | 77837702.61 |
| 2016 | 60717528 | 68558278.68 | 71294428.92 | 72986570.38 |
| 2017 | 68858402 | 61375294.33 | 65944695.2 | 68650203.75 |
| 2018 | 75481714 | 64787964.92 | 63869663.42 | 66673121.8 |
| 2019 | | 72170057.71 | 68352547.89 | 66772676.02 |
| 2020 | | | 48113371.81 | 51264410.92 |

Using the four-year moving average, we can predict the exports for year 2019 and 2020 as follows:

Export forecast for 2019 = 62033060+ 60717528+ 68858402+ 75481714)/$ = $ 66,772,676.02

Export forecast for 2020 = (60717528+ 68858402+ 75481714)/4 = $5,126,4410.92

**Table 4.** Balance of trade forecasts using two, three, and four moving averages

| Year | BOT | BOT 2YMA | BOT 3YMA | BOT 4YMVA |
|---|---|---|---|---|
| 1990 | 1499745 | | | |
| 1991 | 1507437 | | | |
| 1992 | 457793.5 | 1503591.165 | | |
| 1993 | -1233606 | 982615.29 | 1154991.953 | |
| 1994 | 219612.2 | -387906.05 | 243874.9833 | 557842.5575 |
| 1995 | 998087.7 | -506996.735 | -185399.98 | 237809.2775 |
| 1996 | -1403151 | 608849.92 | -5301.93 | 110471.935 |
| 1997 | -1432615 | -202531.84 | -61817.17333 | -354764.2875 |
| 1998 | -2240787 | -1417883.135 | -612559.53 | -404516.6075 |
| 1999 | 1727702 | -1836701.185 | -1692184.577 | -1019616.513 |
| 2000 | 1594778 | -256542.975 | -648566.9533 | -837213.055 |
| 2001 | 2609259 | 1661239.64 | 360563.94 | -87730.7725 |
| 2002 | 2039690 | 2102018.465 | 1977246.147 | 922737.745 |
| 2003 | 2405728 | 2324474.595 | 2081242.32 | 1992857.118 |
| 2004 | 8310869 | 2222708.765 | 2351558.897 | 2162363.615 |
| 2005 | 9046214 | 5358298.31 | 4252095.55 | 3841386.453 |
| 2006 | 1766970 | 8678541.355 | 6587603.403 | 5450625.06 |
| 2007 | 20963440 | 5406592.04 | 6374684.4 | 5382445.175 |
| 2008 | 1714028 | 11365205.11 | 10592207.94 | 10021873.23 |
| 2009 | 12614831 | 11338733.66 | 8148145.937 | 8372662.85 |

 

| Year | BOT | BOT 2YMA | BOT 3YMA | BOT 4YMVA |
|---|---|---|---|---|
| 2010 | 12098748 | 7164429.16 | 11764099.35 | 9264817.135 |
| 2011 | 6589583 | 12356789.49 | 8809202.187 | 11847761.57 |
| 2012 | -2022762 | 9344165.46 | 10434387.22 | 8254297.31 |
| 2013 | -2580616 | 2283410.265 | 5555189.59 | 7320099.875 |
| 2014 | 2233983 | -2301689.315 | 662068.0167 | 3521238.073 |
| 2015 | -353657 | -173316.555 | -789798.42 | 1055046.855 |
| 2016 | 1365484 | 940163.41 | -233429.8867 | -680762.9525 |
| 2017 | 3601126 | 505913.76 | 1081936.963 | 166298.6025 |
| 2018 | 1294391 | 2483305.005 | 1537651.153 | 1711734.208 |
| 2019 | | 2447758.24 | 2087000.183 | 1476836 |
| 2020 | | | 1631838.827 | 1565250.138 |

Using the four-year moving average, we can predict the balance of trade for year 2019 and 2020 as follows:

Balance of trade forecast for 2019 = (-353656.55+12365484.07+3601125.94)/4 = $1,476,836

Balance of trade forecast for 2020 = 1365484.07+ 3601125.94+ 1294390.54)/4 = $1565250

### 4.2 Regression Model for Imports, Exports and Balance of Trade

The economic model for imports follows the linear equation (y=mx + c)

$$Q_i = \beta_0 + \beta_{1t} + \mu$$

where $\beta_0$ is constant

$$\beta_1 = \text{slope}$$

$$\mu = \text{error term}$$

$$Q = -279546420.49 + 140963.56t$$

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.229639232 |
| R Square | 0.052734177 |
| Adjusted R Square | 0.017650258 |
| Standard Error | 5180394.778 |
| Observations | 29 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 4.03376E+13 | 4.03E+13 | 1.503087 | 0.230783 |
| Residual | 27 | 7.24585E+14 | 2.68E+13 | | |
| Total | 28 | 7.64923E+14 | | | |

| | Coefficients | Std Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | -279546420 | 230417966.8 | -1.21321 | 0.235555 | -7.52E+08 | 193232195 | -752325036 | 193232195 |
| X Variable 1 | 140963.5642 | 114978.0233 | 1.226004 | 0.230783 | -94951.85 | 376878.98 | -94951.853 | 376878.98 |

Economic model for exports

$$T = \text{time}$$

$$E = \beta_0 + \beta_{1t} + \mu$$

$$E = -5905608030 + 2967149.415t$$

 

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.918240041 |
| R Square | 0.843164772 |
| Adjusted R Square | 0.83735606 |
| Standard Error | 11096119.78 |
| Observations | 29 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 1.78721E+16 | 1.78721E+16 | 145.1552 | 2.26477E-12 |
| Residual | 27 | 3.32434E+15 | 1.23124E+14 | | |
| Total | 28 | 2.11964E+16 | | | |

| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | -5905608030 | 493542571.2 | -11.965752 | 2.649E-12 | -6918273739 | -4.893E+09 | -6918273739 | -4.893E+09 |
| X Variable 1 | 2967149.415 | 246276.5818 | 12.04803718 | 2.265E-12 | 2461831.609 | 3472467.2 | 2461831.61 | 3472467.22 |

Econometric model for balance of trade

$$E = \beta_0 + \beta_{1t} + \mu$$

$$E = -279546420.5 + 140963.5642t$$

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.22963923 |
| R Square | 0.05273418 |
| Adjusted R Square | 0.01765026 |
| Standard Error | 5180394.78 |
| Observations | 29 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 4.03376E+13 | 4.0338E+13 | 1.503087 | 0.230783 |
| Residual | 27 | 7.24585E+14 | 2.6836E+13 | | |
| Total | 28 | 7.64923E+14 | | | |

| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | -279546420 | 230417966.8 | -1.2132145 | 0.235555 | -7.52E+08 | 193232195 | -752325036 | 193232195 |
| X Variable 1 | 140963.564 | 114978.0233 | 1.22600442 | 0.230783 | -94951.85 | 376878.981 | -94951.853 | 376878.98 |

The model has shown that the exports, imports and balance of trade are anticipated to decrease in the near future due to seasonal nature of the country's performance. However, the decrease will not be lower than the previous four years. The limitation found in the regression model is that it does not accurately predict the future behavior of import, export and balance of trade due the scatting nature of the data plots.

## 5 Conclusion

In nutshell, it is ascertained that Chile has utilized international trade, technology and exposure to the global market; its merchandise has had an upward trend. The study has revealed Chile's imports and exports have been fluctuating due to fluctuation in the prices and unfavorable movements in exchange rates in the global market. The graphs have shown that Chile anticipates an increase in its exports and imports a fact that can be backed up by the model. The increase in the international trade is attributed

 

to the increase in the number of trade agreements, and political stability that is currently observed across the globe. However, the ongoing pandemic is anticipated to change the pattern if it is not addressed urgently. This is because a good number of workforces has been forced to work from home while others being laid off. International flights and travels have been banned meaning that there is a few imports and exports that are currently taking place.

The regression analysis was employed to forecast the growth rate of imports and exports. It is noted that the growth rate of exports is higher than that of imports and this means that there the country is likely to experience a surplus balance of payment. This is due to the increase in the exports that generate more capital inflow than capital outflow through import of goods and services. Chile being one of the main producers of Fish, Ores, Copper, Fruits, Wood, Beverages, and fruits, is a significant contributor to the well-being of the global economy and its vital role is believed to enhance in the near future given the fact that there is an increase in world demand for such variables (exports and imports). The presence of trade agreements exhibits that there is interdependence between countries which is significant in determining the trade patterns of a country.

## References

1. Al-Zyoud, H., & Elloumi, F. (2017). Dynamics of Canadian Trade Pattern: A Time-Series Analysis. *International Journal of Economics and Finance*, *9*(3), 115-125.
2. Bas, M., & Strauss-Kahn, V. (2014). Does importing more inputs raise exports? Firm-level evidence from France. *Review of World Economics*, *150*(2), 241-275.
3. Box, G. E. P., & Jenkins, G. M. (2015). Time Series Analysis: Forecasting and Control. Holder Day, San Francisco.
4. Hruzova, K., Rypka, M., & Hron, K. (2017). Compositional Analysis of Trade Flows Structure. Austrian Journal of Statistics, 26, 49-63. http://dx.doi.org/10.17713/ajs.v46i2.569
5. Mukhtar, T., & Rasheed, S. (2010). Testing long run relationship between exports and imports: Evidence from Pakistan. *Journal of Economic Cooperation and Development*, *31*(1), 41-58.
6. Shahbaz, M. (2012). Does trade openness affect long run growth? Cointegration, causality and forecast error variance decomposition tests for Pakistan. *Economic Modelling*, *29*(6), 2325-2339.
7. Vollaard, H. (2014). Explaining E uropean Disintegration. *JCMS: Journal of common market studies*, *52*(5), 1142-1159.

 