Three Countries from Three Continents Under G21: A Study of the External Sector

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ABSTRACT

The study investigates how the external sectors of selected G21 member nations i.e. Australia, France, and Mexico have functioned since its inception. The time series analysis is made by collecting annual data from the period 2000 to 2022, related to the five major factors of the external sector which are GDP, international trade, direction of trade, exchange rate, and balance of payments. The performance of all these variables is evaluated on the basis of the compound annual growth rates and linear growth rates. A bivariate correlation analysis between the GDP and net trade is made by using Karl Pearson's correlation coefficient method which has revealed the existence of a positive and statistically significant relationship between economic growth and net trade in Australia. Contrarily, France and Mexico have shown inverse relationship between net trade and GDP because both countries faced higher trade deficits during the given period (2000-2022). However, the correlation coefficient for Mexico has been weak and little significant statistically. The study suggests the promotion of export-oriented industries, overseas investment and partial capital controls.

Keywords: - G21, external sector, GDP, international trade, exchange rate, balance of payments

JEL codes: - F31, F43, F140

1. Introduction

The widespread proliferation of globalisation has brought numerous advantages worldwide accompanied with a host of global issues such as economic disturbances like East Asia crisis, Euro crisis, economic recession of 2008, etc. Such global challenges demand for the collaborative efforts and reforms which leads to the integration of the world's developing as well as developed economies and form international organisations such as ASEAN (Association of Southeast Asia Nations), OECD (Organisation for Economic Co-operation and Development), G20 (now G21), etc., which work together to promote free trade, global peace and environmental sustainability. The present study focuses on G21 standing for the group of 21, an international organization of countries whose purpose is to work together and coordinate their economic policies to tackle major global economic issues. The organization was established on 26 September 1999 by a joint decision of finance ministers of the G7 countries primarily as a forum of 19 countries and the European Union (G20). With advent of the African Union, it has restructured into G21 with effect from September 9, 2023. Since its establishment, it has consistently endeavoured to build a robust and resilient global economy capable of withstanding global disturbances through implementing various financial reforms and supportive policies. To understand and assess the performance of a country's economy on the global stage, it becomes imperative to analyse its external sector. It is of utmost importance for a nation to understand and strengthen its global relations because one's external sector encompasses all those activities that involve the movement of goods & services, money, and financial securities from one country to another. Calderón, C., & Chong, A. (2001) found that the volume of trade, the real exchange rate, intensity of capital controls, and net exports impact the income distribution of countries. Wattananukit, A., &Bhongmakapat, T. (1989) examined the effects of external sector growth on Thai economy and found that growth of external sector leads to growth of real GDP through export expansion and inflow of foreign capital in Thailand. Meanwhile, the growth of external sector brings the exposure to global economic shocks and global decisions which can adversely impact an economy. Mesa-Lago, C., & Vidal-Alejandro, P. (2010), for example, found that Cuba's higher external dependency for trade and finance and the use of multiple currencies led to the deceleration of economic growth and severe banking crisis. Therefore, the present study focuses on assessing the performance of external sector of selected G21 countries through analysing its five major determinants which includes GDP, international trade, direction of trade, exchange rate, and balance of payments from the period 2000 to 2022. All of these variables have a significant impact on one's external sector performance.

This study primarily focuses on examining the performance of the external sector of the selected G21 countries which are Australia, France, and Mexico by assessing the variations and patterns of growth in the selected variables from the year 2000 to 2022. The study broadly aims at finding the

impact of G21 on the external sectors of selected countries. Moreover, this study attempts to establish the nexus between GDP and net trade in the selected countries.

2. Review of literature

According to a study by Fox, K. J. & Kohli, U. (1998), the Australian GDP was found to be grown with non-traded goods prices accounting for two-thirds of the increase, capital accumulation, technological changes, and employment growth, whereas Australia's higher dependence on exports of primary products keeps the impact of terms of trade weaker. Conversely, Guo, H., & Zhang, Z. (2022) observed the negative impact of macroeconomic variables such as gross savings, consumer price index, unemployment, population on Australia's GDP, whereas the rate of interest has a positive relation with its GDP. The effect of exposure to global economy and liberalisation policies on the Mexican economic growth has been examined by the Blecker R. A. (2009) with the application of regression techniques and structural break tests growth model on five variables such as, net financial flows, world oil price, US growth rate, the real value of peso & Mexican growth rate, whereas Ibarra, C. A., &Blecker (2014) estimates the BOP-constrained growth for Mexico by using 4 variables i.e., endogenously determined manufactured and non-manufactured exports, and import of final and intermediate goods along with integrating effects of real exchange rates for estimating growth rate consistent with BoP-equilibrium. It has been found that the economic growth of Mexico is influenced by real non-oil exports (RNOX), real imports (RIMP) and real foreign direct investment liabilities (RFDIL), but has a two-way relationship with RFDIL only, as per a study conducted by Romero J. (2015). Vazquez-Munoz, J.A. (2018) emphasized the role of Capital Accumulation and capital productivity growth rate in the determination of the economic growth of Mexico in long-run. Amiri, A., &Gerdtham, U.G. (2011) establish one-way relationship of growth of exports and imports with GDP in France by finding Granger causality through application of geostatistical measures. A study by Mendoza, E. G. (2005) has proved that the prices of non-tradables bring greater variations in exchange rate under the exchange rate management system than the flexible exchange rate system by constructing a model of liability dollarization and restricted credit which developed a financial accelerator system. Ihrig, J. E., Marazzi, M., & Rothenberg, A. D. (2006)investigated the process of transmission of fluctuations in the foreign exchange rate to import prices as well as consumer goods prices where the responsiveness of these prices concerning changes in foreign exchange rate among the G-7 countries was reduced since the 1970s and 1980s. Hsing, Y. (2010) and Atif, S. M., et.al. (2012)found the existence of a strong and significant relationship of the Australian exchange rate with net exports, current account balance, money supply, expected inflation rate, and real output. These findings are in line with Bashar and Kabir (2013), who found a positive relationship of commodity prices and interest rates with exchange rate, whereas an inverse relation with global financial crisis. Nalin, L., & Brid, J.C.M. (2022) observed that undervaluation affects the manufacturing sector positively with varied impacts, whereas overvaluation leads to the contraction of manufacturing activity with the highest impact on labour-intensive industries and affects overall economic growth. Chinn, M. D., & Prasad, E. S. (2003) found a Positive correlation between the possession of net foreign assets' stock, relative per capita income, average rate of output growth, government budget balance and financial deepening with current account surplus, whereas the higher ratio of dependent population and high magnitude of openness leads to negative current account balances in line with findings of Adams, N., & Atkin, T. (2022), who investigated the causes and trends related to the transition of the current account balance from deficit to surplus in Australia.Ekanayake, E.M. (2001) and Rahman, M. M. (2009) found direct relation of external trade with per capita income, size of the country, the intensity of trade, openness, common language and common border, whereas an inverse relation was found with trade imbalances, variations in income, and distance. Di Giovanni, J., Levchenko, A.A., &Mejetoan, I. (2020) scrutinized the effects of business cycle shocks on the French economy by largely impacting larger firms who were more indulged in the international trade.

3. Data and Methodology

3.1 Data and Sources

This study considers mainly five variables reflecting the external sector performance which are GDP, International trade, direction of trade, exchange rate, and BoP from the period 2000 to 2022. The data for GDP and GDP per capita have been extracted from the World Development Indicators of the World Bank taken at the prices of 2015 as a base year, expressed in terms of US Dollars, whereas the trade related data have been collected from the Direction of Trade Statistics, IMF. Moreover, the International Financial Statistics, IMF provides the exchange rates for the selected countries against the US dollars. The annual data related to the balance of payments has been obtained from the Balance of Payment and International Investment Position Statistics, IMF. All variables of this study are expressed in the terms of US dollars.

3.2 Research Methodology

The present study estimates the compound annual growth rate (CAGR) to assess the long-term growth pattern of all variables for the given period except for the balance of payment and its various components. The performance of the Bop and its various accounts has been assessed by finding the linear growth rates through fitting a linear regression function. Besides, the shares of top ten trading partner countries of Australia, France, and Mexico have been illustrated with the help of pie charts. The study used the line graphs to represent the variations in the exchange rates of the selected countries. Finally, the Karl Pearson's coefficient of correlation method is used to assess the long-run relationship between GDP and net trade.

3.2.1 Compound Annual Growth Rate (CAGR)

The compound annual growth rate (CAGR) is defined as the rate at which a variable grows over a specific period exceeding one year. The study calculates the 23-year growth rate of various variables expressed in terms of percentage by using the following formula: -

$$\textbf{CAGR} = \left(\frac{\textbf{Ending value}}{\textbf{Starting value}}\right)^{\left(\frac{1}{n}\right)} - 1$$

where 'n' stands for the number of years observed

3.2.2 Linear Growth Rate

The linear growth rate is defined as the constant rate at which a variable either increases or decreases over a specific period. It is calculated by fitting a linear function which is as follows:

$$Y = a + bt \qquad\qquad\qquad -(i)$$

Where Y= Dependent variable,

t= time period, and

a and b are parameters which are calculated by using the ordinary least square method.

$$\textbf{Linear Growth Rate (g\%)} = \frac{b \times 100}{\bar{Y}}$$

b= estimated coefficient of regression of Y on t

$\bar{Y}$= Mean value of Y

The Linear growth rate method is estimated to assess the growth pattern of various accounts of BoP than CAGR because the data related to BoP contains negative values in some years. Therefore, the linear growth rate is more appropriate.

3.3.3 Standard Deviation

The Standard deviation is a method that explains how far the actual values deviate from the central value of the series, more specifically from the mean and denoted by 'σ'. The formula for standard deviation is as follows: -

$$\textbf{Standard Deviation} = \frac{\sqrt{(x-\mu)^2}}{N}$$

Where, x=actual value from the series, and μ= mean of the series, N= number of observations in the series.

The standard deviation is used in this study to assess deviations in the exchange rates of the selected countries.

3.3.4 Correlation

A correlation analysis is a statistical method to find the direction and magnitude of interrelatedness between two or more variables. The present study uses the Karl Pearson's Correlation Coefficient method to find the bivariate relationship of imports and exports with the GDP of the country by using the following formula:

$$\textbf{Correlation Coefficient (r)} = \frac{N \cdot \sum(xy) - \sum(x)\sum(y)}{\sqrt{[N \cdot \sum x^2 - (\sum x)^2] - [N\sum y^2 - (\sum y)^2]}}$$

Where, N= number of observations, x= First variable of the series, y= second variable of the series

4. Analytical Framework

This section encompasses the evaluation of the external sector performance of all selected countries for the given period of 23 years by examining the growth pattern in the selected variables. The performance of each variable will be studied which is as follows: -

4.1 GDP of the Nation

The present study uses the two indicators of GDP to evaluate the growth of the economy which are real GDP, and real GDP per capita, expressed in terms of U.S. Dollars. The rationale behind taking both GDP measures at constant prices is to facilitate the comparison of changes in actual output throughout the given period that takes into account the effects of changes in general price level by taking a common base year such as the year 2015 deemed to be the base year for this study. Table no.1 demonstrates the growth pattern of real GDP and real GDP per capita in the selected countries during 23 years of analysis.

Table No. 1: Growth of GDP (On the basis of 23-Year CAGR)

Countries	GDP (Constant 2015 US$)	GDP Per capita (Constant 2015 US$)
Australia	2.61%	1.23%
France	1.12%	0.64%
Mexico	1.53%	0.37%

Source: World Development Indicators, World Bank

Note: (Author's calculations)

It is vividly clear from the Table no.1 that the Australian economy has grown robustly over the given period by reporting the highest average annual growth in both real GDP and per capita real GDP at the rate of 2.61% and 1.23% respectively, whereas France's real GDP and GDP per capita have grown moderately at 1.12% and 0.64% CAGR respectively. On the other hand, the growth in Mexico's real GDP has been fairly good with a CAGR of 1.53% but its per capita real GDP grew at a comparatively slower average rate of 0.37%. The wedge between the growth rate of real GDP and real GDP per capita indicates the relatively higher growth rate of population, where Mexico has notably lowest CAGR for per capita real GDP owing to faster population growth.

4.2 International Trade

International trade or external trade is the most significant part of a country's external sector comprising of exchange of goods and & services among different nations according to their specialization and deficiencies that allow them to build strong relationships. The present study has extracted the trade related data from the Direction of Trade Statistics, IMF for the given period, and assessed the shares of imports, exports and total trade to GDP. The performance of external trade of the selected countries has been evaluated by estimating their respective CAGR, as presented by the Table no. 2.

Table no. 2: Growth of External trade (On the basis of 23-Year CAGR)

Countries	Imports	Exports	Total Trade	Share of Trade to GDP	Share of Exports to GDP	Share of Imports to GDP
Australia	6.53%	8.47%	7.54%	4.81%	5.72%	3.82%
France	3.92%	2.81%	3.41%	2.26%	1.67%	2.77%
Mexico	5.55%	5.57%	5.56%	3.97%	3.98%	3.96%

Source: Direction of Trade Statistics, IMF

Note: (Author's calculation)

Table no. 2 depicts that Australia's trade has expanded at an extremely high average annual growth rate of 7.54% indicating that external trade of Australia has considerably improved over time. Moreover, the share of exports to GDP (5.72%) surpasses the share of imports to GDP (3.82%) highlighting its remarkable trade surpluses. On the other hand, France has shown a balanced trade portfolio by holding closer shares of exports and imports with respect to GDP i.e., 1.67% and 2.77% respectively. Although the trade expansion has been lowest in France at a CAGR of 3.41%, but it has shown steady level of trade engagement. A moderate trade growth has been depicted by Mexico at a CAGR of 5.56%, while share of exports to GDP (3.98%) and share of imports to GDP (3.96%) almost coincides with each other showing similar trade balances like France.

4.3 Direction of Trade Statistics

The direction of trade is defined as the study of the disaggregation of trade into various trading partner countries. The study has explored the trading partners of the selected countries by dividing it into two parts: a) By finding the top ten major trading countries based on the total trade in year 2022 b) Trade performance with member countries of the G20 as 21st member (the African Union) is included in year 2023.
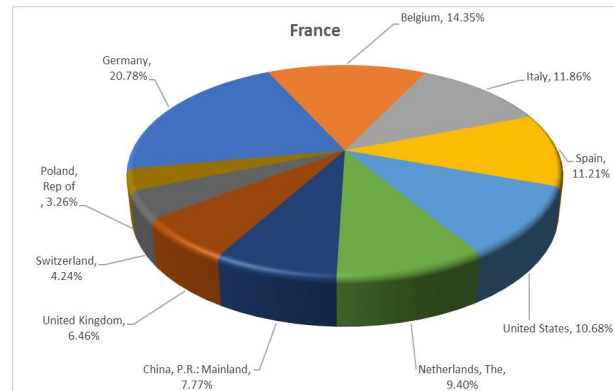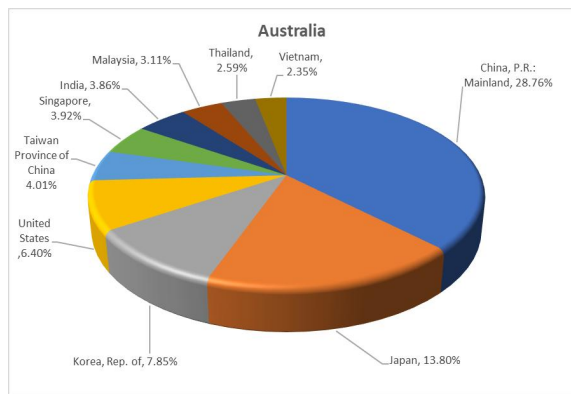
4.3.1 Top 10 Trading Partner Countries

Figure 1: Top 10 Trading Partner Countries of Selected Countries in 2022

Source: Direction of Trade Statistics, IMF

Figure 1 delves into major trading partners of Australia, France and Mexico on the basis of year 2022 total trade. Among all three countries, Mexico is the only country that has directed more than 70% of its external trade to a single country i.e., the United States. Such a high reliance on one country can increase the vulnerability to economic shocks in that partner country. On the flip side, Australia and France have wisely diversified their trade to several nations which reduces exposure to economic disturbances and provides more opportunities to explore new global markets.
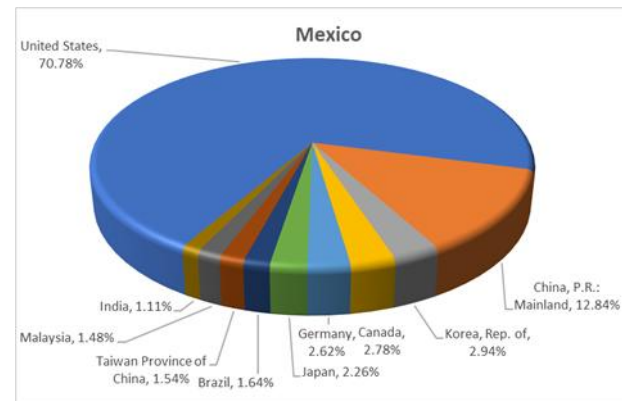
4.3.2 Total Trade with G20

In order to compare the impact of G21 on the selected countries, this study compares the total trade of selected countries with G20 member nations and with the countries apart G20 and, the shares of total trade with G20 countries and with the countries other than G20 with respect to their total world trade. Table no. 3 demonstrates the growth of total trade with G20 based on 23-year CAGR.

Table no. 3: Growth of Total Trade with G20 (On the basis of CAGR)

Countries	Total Trade with G20	Total trade with countries other than G20	Trade with G20 as a % of World Trade	Trade with countries other than G20 as a % of World Trade
Australia	7.80%	6.89%	0.24%	-0.60%
France	3.43%	3.27%	0.03%	-0.14%
Mexico	5.37%	8.03%	-0.18%	2.33%

Source: Direction of Trade Statistics, IMF

Note: (Author's calculation)

Table no. 3 provides insights into performance of the selected countries' total trade with G20. Australia has remarkably expanded its trade with G20 economies at an average rate of 7.8% surpassing its trade with rest of the world that accounts for CAGR of 6.86%. However, the share of total trade with G20 to world trade rises by 0.24%, whereas the share of trade with rest of world exhibits a negative growth of -0.60%. On the other hand, France demonstrates similar growth in both trade with G20 nations and with rest of the countries by reporting the CAGR of 3.43% and 3.27% respectively. Contrarily, Mexico has exceptionally displayed distinct behaviour by reporting growth of trade with countries outside G20 at 8.03% outpacing the growth rate of trade with G20 countries standing at 5.37%. Besides, a negative CAGR of -0.18% for share of total trade with G20 as a percent of world trade in contrast with CAGR of 2.33% for share of total trade with rest of world in world trade indicates that Mexico pays due importance on expanding trade with nations outside G20. Finally, it can be concluded that unlike Mexico, Australia and France have remarkably expanded their interaction with G20 member nations through trade expansion.

4.4 Exchange Rate

This study evaluates the performance of exchange rate for selected countries, expressed in terms of US Dollars as shown by figure 2. The line graphs are drawn by taking the value of domestic currency per US dollar period average from the International financial Statistics, IMF from the year 2000 to 2022.
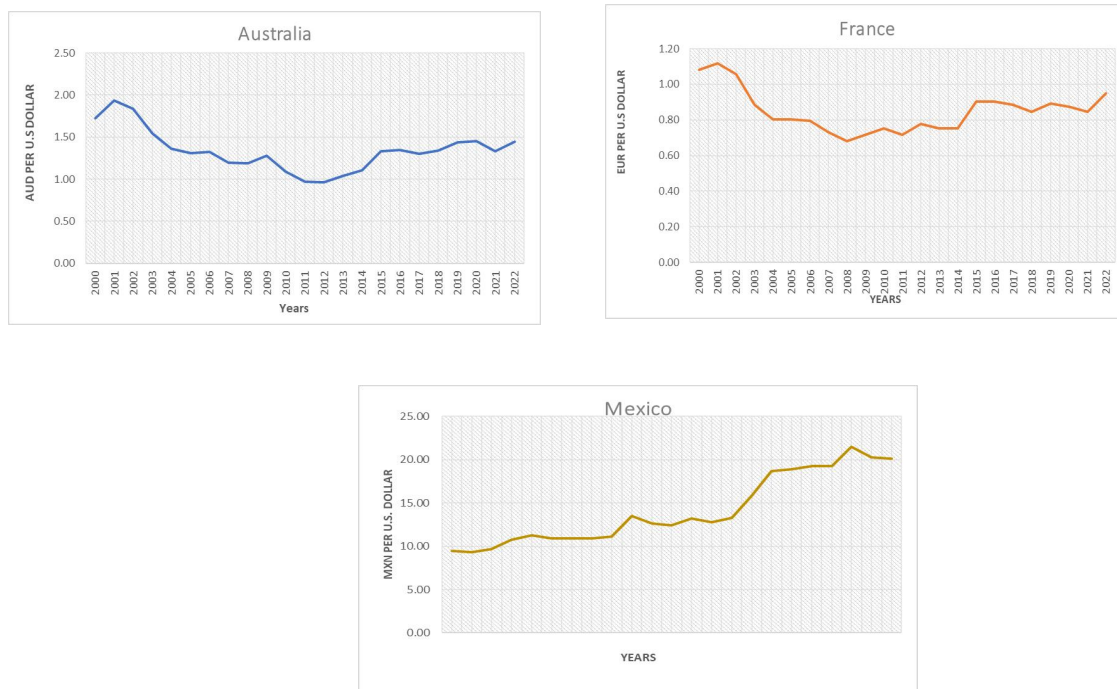

Figure 2: Exchange rates of selected countries against US Dollar

Source: International Financial Statistics, IMF

The above figure highlights the variations in the exchange rates of the selected countries against US dollar (period average). The Australian dollar and the official currency of France i.e., euro have appreciated considerably against US dollar during the period of analysis by following multiple ups and downs, but euro has notably become more stronger against US dollar. It can be seen that AUS dollar appreciated from US $1.72 to 1.44$, whereas the value of euro increased from 1.08 to 0.95 US dollars. On the flip side, the Mexican Peso (MXN) has been the relatively weakest as shown by the remarkable upsurge in its exchange rate for the said period from the US dollar 9.46 to 20.13 which adversely impacts the import bills of Mexico. Moreover, the exchange rate of Mexico remained highly volatile with value of standard deviation standing at 4.04 in contrast with Australia (0.25) and France (0.12).

4.5 Balance of Payment

The study assesses the performance of BoP in Australia, France, and Mexico including its various components on the basis of linear growth rate for the given period from 2000 to 2022, summarised by the Table no. 4. The net BoP is calculated by using formula prescribed by IMF's international standards which is as follows: -

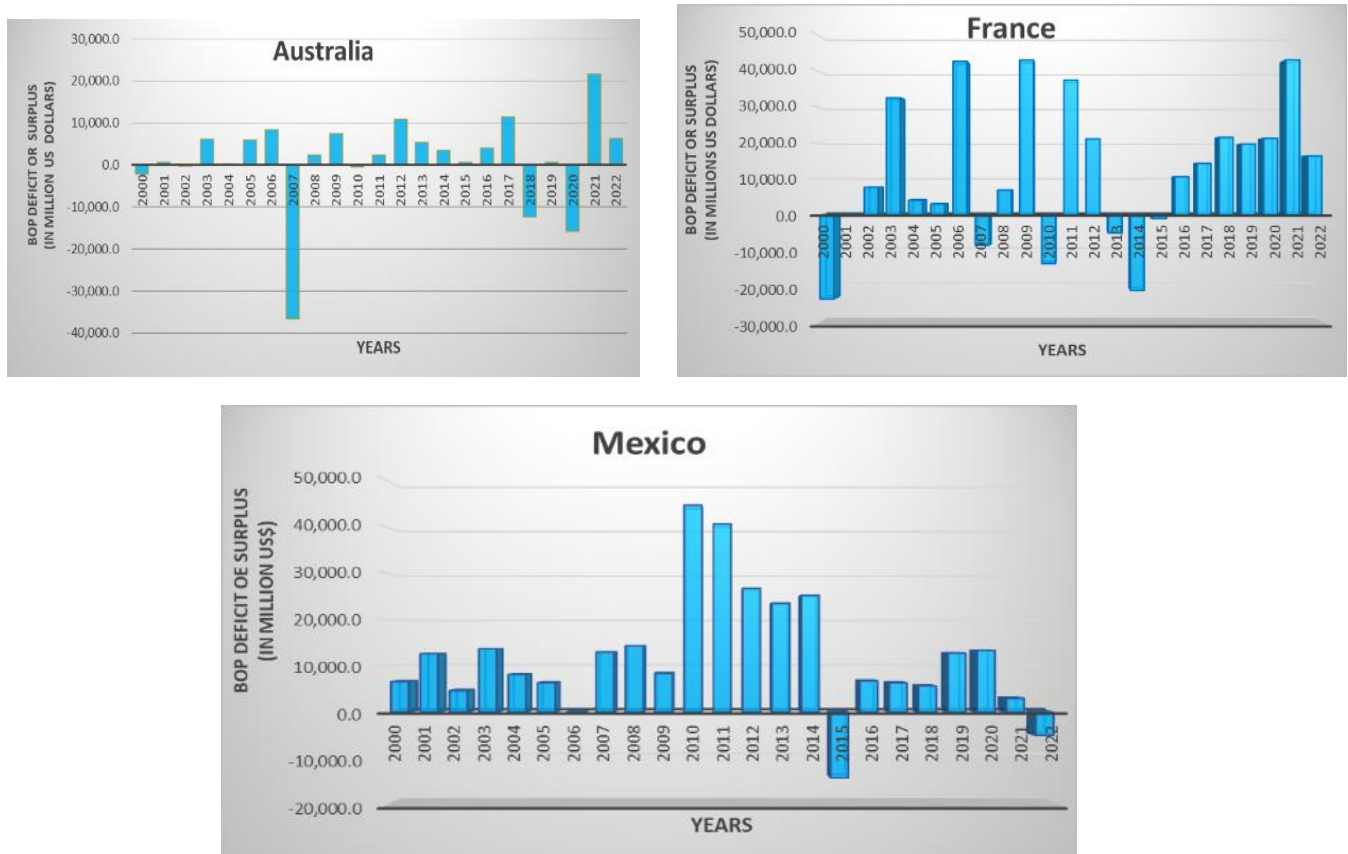**Net Balance of Payment= (Net current account+ Net capital account)- Net financial account**

Figure 3: Net Balance of Payments of the selected countries

Source: Balance of Payment and International Investment Position Statistics, IMF

Figure 3 demonstrates that the selected countries experience consistent large surpluses throughout the whole period of analysis except for few years. Further, the study estimates linear growth rates of its components which represented by Table no. 4.

Table no. 4: Performance of BoP (On the basis of Linear Growth rate)

	Countries	Net Current Account	Net Capital Account	Net Financial Account	Net Reserve Assets
Source	Australia	-6.28%	6.27%	-5.22%	5.35%
	France	16.51%	13.66%	11.28%	23.85%
	Mexico	1.02%	-14.95%	-0.45%	-3.58%

Balance of Payment and International Investment Position Statistics, IMF

Note: (Author's calculations)

Table no. 4 shows that the net current account growth remained positive both in France and Mexico by reporting extremely high growth rate of 16.51% in France which highlights relatively strong performance in trade compared with Mexico's growth rate of 1.02%. Meanwhile, Australia faces a negative current account growth rate of-6.28%. Similarly, Australia and France possess the net capital account growth rate of 6.27% and 13.66% respectively which is indicative of rise in net capital inflows, whereas unfavourable growth rate of -14.95% in Mexico's net capital account suggests the dearth of net inflows of capital in Mexico. A growth rate of 11.28% in France's net financial account reflects the larger inflow of foreign assets and investments, while a negative growth of net financial account in Australia (-5.22%) and Mexico (-0.45%) implies the contraction in net outflow of foreign assets. Finally, France outpaced all by reporting highest growth in net foreign exchange reserves of 23.85% in contrast with Australia, who enjoys a net increase in the reserve assets at the rate of 5.35% and Mexico, who experiences a net decline in the accumulation of foreign reserves at the rate of -3.58%.

4.6 Correlation Analysis

The present study uses bivariate correlation analysis to investigate the relationship of real GDP with net trade in the selected countries of G21 by using the Karl Pearson's correlation coefficient method. Net trade is defined as difference between total exports and total imports, where the positive balance indicates net exports and negative balance indicates net imports. In order to establish relationship among GDP and net trade, the hypothesis testing will be as follows: -

H0: There is no significant linear relationship between real GDP and net trade of selected countries

H1: There is a significant relationship between real GDP and net trade of selected countries.

The results for the correlation between real GDP and net trade in Australia, France, and Mexico are shown in Table no. 5.

Table No. 5: Correlation Between Real GDP and Net Trade (α= 0.01)

Country	Pearson's Correlation Coefficient	Sig. (2- tailed)
Australia	0.689	0.0001
France	-0.803	0.0001
Mexico	-0.499	0.015

Source: Author's Calculation

Note: Correlation is significant at the 0.01 level (2-tailed)

Table no. 5 reveals that a positive correlation coefficient of 0.689 indicates the existence of moderately positive and statistically significant relationship between the GDP and net trade in Australia because it has positive net trade balance. It indicates that rise in GDP will increase net trade by way of stimulating exports through higher production and investment. Similarly, rise in net trade (net exports) stimulates economic growth by generating the benefits of economies of scale and specialisation due to large scale production. On the other hand, highly negative relationship between GDP and net trade has been found in France due to existence of unfavourable trade balance. It means if GDP rises, the net trade balance of France falls owing to high trade deficits. Conversely, unfavourable net trade balance hampered the economic growth of France. In the case of Mexico, the value of correlation coefficient is -0.499 which implies a weaker negative relationship between growth and net trade balance. The p-value of 0.015 suggests that the relationship is statistically significant but not strong. Therefore, it can be concluded that positive net trade adds to the nation's GDP, whereas the negative trade balance has an inverse relation with economic growth.

5. Concluding Remarks and Policy Implications

The present study evaluates the performance of the external sector of the selected member countries of G21 which are Australia, France, and Mexico for the post-establishment period of G21 through examining some of the major variables determining the functioning of one's external sector. The five major variables reflecting the external sector performance which are GDP, international trade, the direction of trade, exchange rate, and balance of payments are analysed spanning the years from 2000 to 2022. This study computes the compound annual growth rates and linear growth rates to assess the long-term growth in these variables for the given period. The study revealed that Australia excelled all by reporting the highest GDP (2.61%) and GDP per capita (1.23%). However, France exhibits higher GDP in absolute terms. Moreover, the trade engagement with G20 member nations is found to be reduced considerably in Mexico as compared with Australia and France. The Australian dollar and euro have gained remarkable strength during the analysis period, whereas the Mexican peso has depreciated notably and remained highly unstable as evident by the higher value of standard deviation of 4.04. It has found that the balance of payments of all the selected countries experience consistent surpluses throughout the whole period of analysis with exception in few years. A bivariate correlation analysis is made to assess the association between GDP and net trade by applying Karl Pearson's coefficient of correlation. The results of correlation revealed the presence of a moderate degree of positive and significant relationship between GDP and net trade for Australia, whereas the correlation coefficients for France and Mexico remained negative owing to unfavourable net trade balance which suggests that an inverse relationship between GDP and net trade. However, this negative relationship between GDP and net trade is found to be weak and little significant in Mexico. As policy implications, the present study suggests the encouragement to export promotion of goods strategies to reduce the pressure on the trade balance in those countries which heavily rely on imports such as Mexico. Moreover, government should encourage domestic businessmen, individuals, and corporations to mobilize their resources into overseas investment by way of implementing various policies such as tax rebates on foreign investments and capital gains which will improves the net foreign asset position of a country.

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