A BASELINE MEASURE FOR POST-COVID19 EXPORT PERFORMANCE: THE CASE OF INDIA

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During crises, governments resort to extraordinary fiscal and financial measures and these policy choices along with aggregate demand and supply shocks affect the exporting environment of a country through many channels. Therefore, to analyze any post COVID pandemic inefficiencies, it is important to distinguish the already inherent inefficiencies in the exporting environment to provide a benchmark for comparative purposes. This study investigates the prevalence of inefficiencies in the exporting environment in India during the post GFC period (2010-18) using a stochastic frontier gravity model. The empirical analysis reveals that inefficiencies were already present in the post GFC period before the onset of COVID, which has increased over time. Using the data from the Economic Freedom Index, among other factors, the study found out that sound money dimension, including the November 2016 sudden implementation of the demonetization policy by the Indian Government was crucial in influencing India's export efficiency.

*Keywords*: Exports, Inefficiency, Productivity, Stochastic Frontier Gravity Model, COVID, India, Potential Exports

JEL Classification: F14, F18, E61, F41, F62, F63, F68

1. INTRODUCTION

The IMF has termed the 2020 COVID 19 pandemic driven recession as 'a crisis like no other'. The reason for naming this crisis like this is because the world has not experienced a downturn in its economic activity at such a scale both in breadth and depth since the World War II. There have been crises before more than once in almost every decade since the World War II. However, this crisis is different from the rest as the countries have experienced a systemic economic shock due to synchronized nature of the downturn both in terms of supply and demand that brought domestic disruptions as the COVID 19 spread across the countries. In other crises, the shocks were mostly idiosyncratic affecting countries differently due to the countries' relative exposure to the

countries emanating the demand shocks. For example, in 2007 there was the sub-prime crisis in the United States (US), the downturn effects of which later merged with the Global Financial Crisis (GFC) that took place in the last quarter of 2008 due to the fall of Lehman brothers. The World output growth reduced to -1.67 percent in 2009. The shock spread to Europe through financial channels that later brought the downturn in the real sectors of the various economies due to the fall in demand in the major advanced economies.

Due to COVID 19 pandemic, the global trade contracted by approximately -3.3 percent in 2020 due to weak demand, collapse in cross-border tourism, and supply disruptions, which further deteriorated due to trade restrictions in certain cases. According to the WEO's April 2021 report, the advanced economies experienced a reduction in their output by -4.7 percent in 2020, while the emerging market and developing economies -2.2 percent. In the emerging and developing Asia, the gross domestic product (GDP) growth reduced by -1.0 percent and in the emerging and developing Europe -2.0 percent in 2020. Latin America and the Caribbean observed a reduction of -7 percent, Middle East and Central Asia -2.9 percent and Sub-Saharan Africa -1.9 percent. Almost all the countries around the globe were affected due to COVID 19 pandemic induced disruptions, however, the individual countries differed in economic impact levels due to differential spread of pandemic, effects of containment strategies, differences in economic structures (for example, tourism and oil dependent economies), reliance on external financial flows (including remittances) and growth trends before the COVID-19 crisis. The world trade in goods and services reduced by -8.5 percent in volume terms, while commodity prices, interest rates (six months London interbank interest rate) and inflation remained stable in 2020.
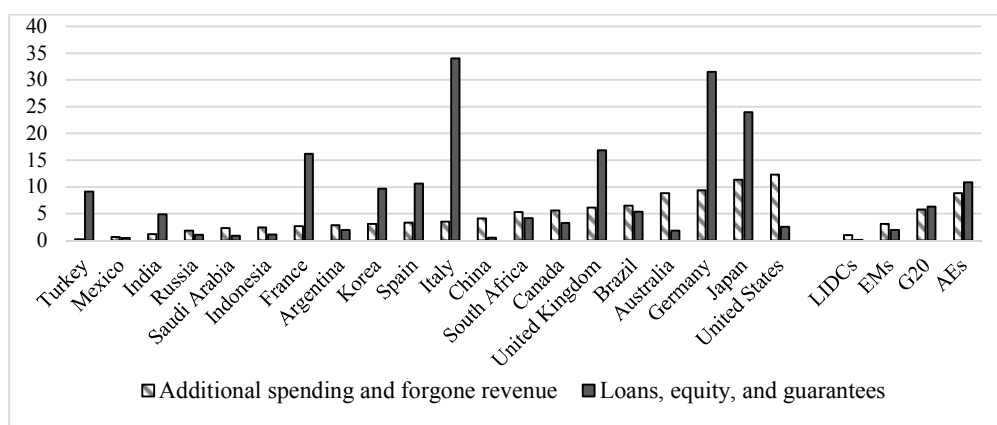
Source: IMF WEO June 2020

Figure 1. Country Fiscal Measures in Response to the COVID-19 Pandemic
(Percent of GDP)

As the health response to COVID 19 required the containment measures such as social distancing, lockdowns, business closures that led to disruptions in supply chains and restrictions on cross border movement of people and air travels. The economic effect of COVID 19 health measures led to steep income losses resulting in weak consumer and investor confidence. The aggregate demand declined, which was further compounded due to supply interruptions and lockdowns. This had a catastrophic effect on the labour market as 300 million full-time jobs were possibly lost in the second quarter of 2020 compared to the same period of the last year (ILO, 2020).

Governments responded to the crisis by employing fiscal and financial countermeasures to forestall and minimize the adverse effects of the crisis as shown in Figure 1. Assistance and financial support were provided to the firms to retain the workers and regulatory actions were taken to ensure continued credit provision to avoid bankruptcies.

The abrupt contraction in output resulted in fall in revenues, which led to a sudden surge in government debt and deficits. As Figure 2 presents, the pattern of global debt and overall fiscal balance resembled to the GFC period, however, rather more pronounced during the COVID-19 crisis. The governments relied on the fiscal and financial support measures to mitigate the recessionary effects of the crisis and position the economies on the path to recovery as they did during the GFC.

The countries exporting environment has been exposed to two-way macro-economic policy actions undertaken during the crisis to minimize its impact of the COVID. One set of policy actions comprised of fiscal and financial support expansionary measures in combination with, imposition of tariffs and non-tariff barriers and restrictions in movement of people and goods which likely caused distortions in the financial and factor markets, exchange rate movements, and presumably adversely affected the competitiveness of exporting environment of a country. The second set of policy measures were the similar form of measures adopted by the importing countries to support their economies in the light of crisis driven aggregate demand and supply shocks. Therefore, the objective of this paper is to suggest a baseline measure to gauge the expected impact of COVID19 eradication policies on export performance of countries.

In addition, insights can be drawn through a country specific empirical analysis on historical data to guide the policy makers about the impact of policy choices adopted both internally and externally during COVID pandemic on the exporting competitiveness of a country. India as a case study is chosen in this study mainly because it is a fast-growing emerging economy in Asia and currently is the country with the largest population in the world.

This paper examines the impact of post GFC policies implemented in India and globally on the exporting environment of India to draw insights for COVID pandemic driven policy actions. In a two-stage analysis, the theoretical framework of the stochastic frontier gravity model has been employed for the first time in crisis context to measure the level of export efficiency of India, which is defined as the ratio of realized exports to potential exports, with respect to its each trading partner before the onset of the COVID-

19 pandemic. In the second stage, identification of the determinants of country-specific export efficiency of India with its trading partners is carried out.
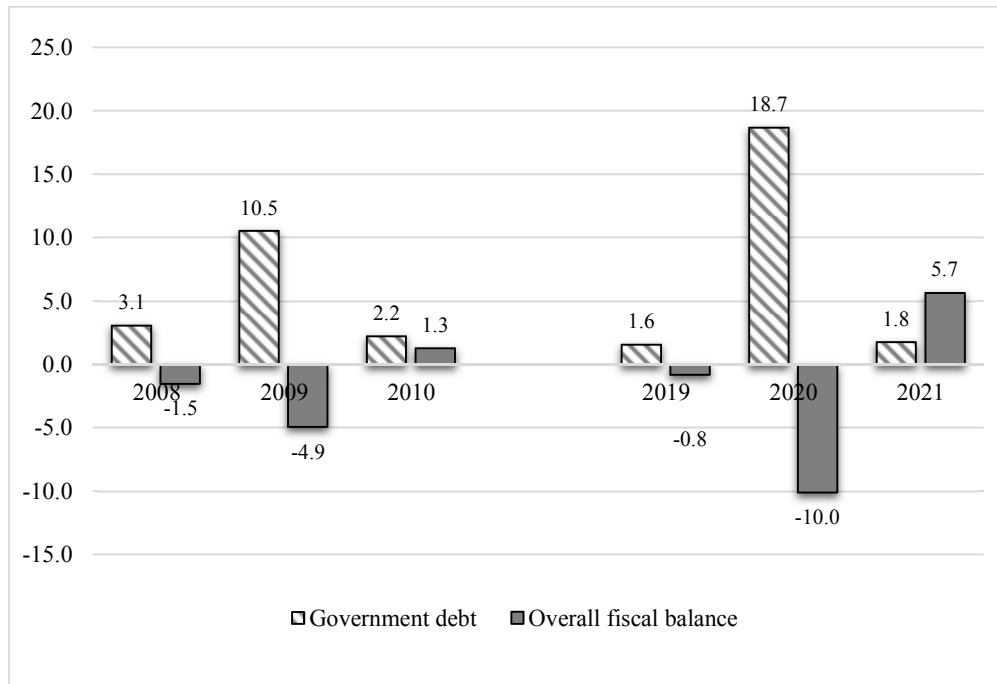
Figure 2. Change in Global Government Debt and Overall Fiscal Balance
(Percent of GDP)

The period for analysis has been selected as 2010-18, because most of the economies returned to their long-term growth trend in 2010 in the post GFC period. Same is the case for India that too returned to the long-term growth trend in 2010 after the GFC. The analysis has been restricted to 2018, because the Fraser Institute's economic freedom index (EFI) has been used in the second stage efficiency model (that analyzes the impact of both internal and external policy actions on export competitiveness) for which the data is available until 2018 (Fraser Institute, 2020).

The organization of the paper is as follows. Section 2 provides a brief economic profile of India followed by Section 3, which deals with the methodology of the stochastic frontier gravity model in a panel data framework. Data is presented in Section 4 and Section 5 detailing the results of the model along with policy discussions. Conclusion and policy implications of the paper are given in Section 6.

2. BRIEF ECONOMIC PROFILE OF INDIA

The Indian economy grew by more than 7 percent year on year during the period 2003-2007 as shown in Figure 3. It slowed down in 2008 due to GFC before returning to above 7 percent year on year growth in 2009 and 2010. In 2009, the government resorted to fiscal and financial measures because of which government debt levels increased and overall fiscal balance went into deficit as has been presented in Figure 1 above. The 2011 and 2012 experienced a relatively slow period of growth and from 2013 onwards, the Indian economy bounced back to above 7 percent growth until 2017.
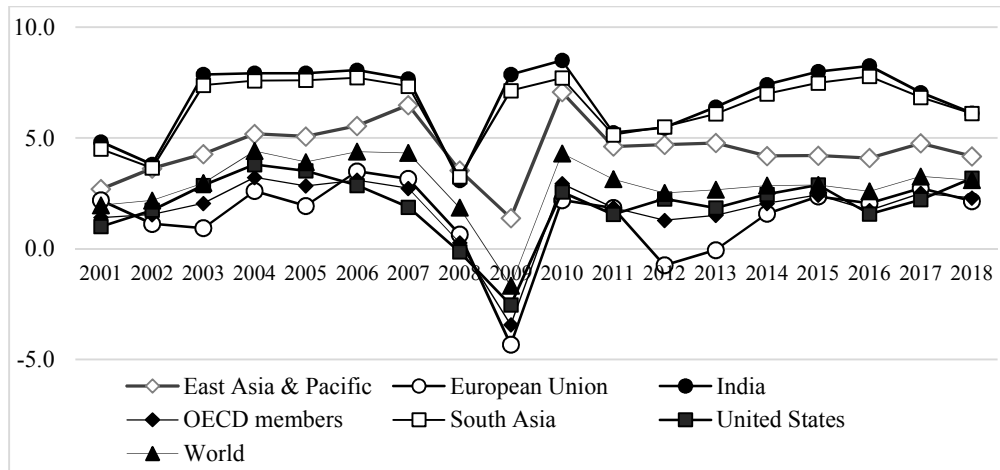
Source: World Development Indicators

Figure 3. Gross Domestic Product Growth Rates in Percentages (2001-18)

Figure 4 depicts that merchandise trade constituted more than 20 percent of GDP in 2001 and reached its high of more than 40 percent of GDP in 2008. After a sharp decline in 2009, it gradually increased to reach the level of 2008 and then started declining from 2012. Merchandise trade as a percentage of GDP in 2018 was lower (30.9 percent) than the level of 2010 (34.4 percent)

A comparative performance of India's goods trade is presented in Figure 5. It shows that the performance of India's goods export followed a common pattern as exhibited by the other selected countries in Figure 5. Therefore, it is important to consider the demand conditions in destination countries as macroeconomic policies affect the demand for goods. In addition, Figure 5 presents that India's goods exports grew during 2009-11; however, it fell in 2012 in absolute terms. It achieved its 2011 level again in 2013 and then slightly grew in 2014. In 2015 onwards, it has exhibited declining and a stagnant trend until 2018.
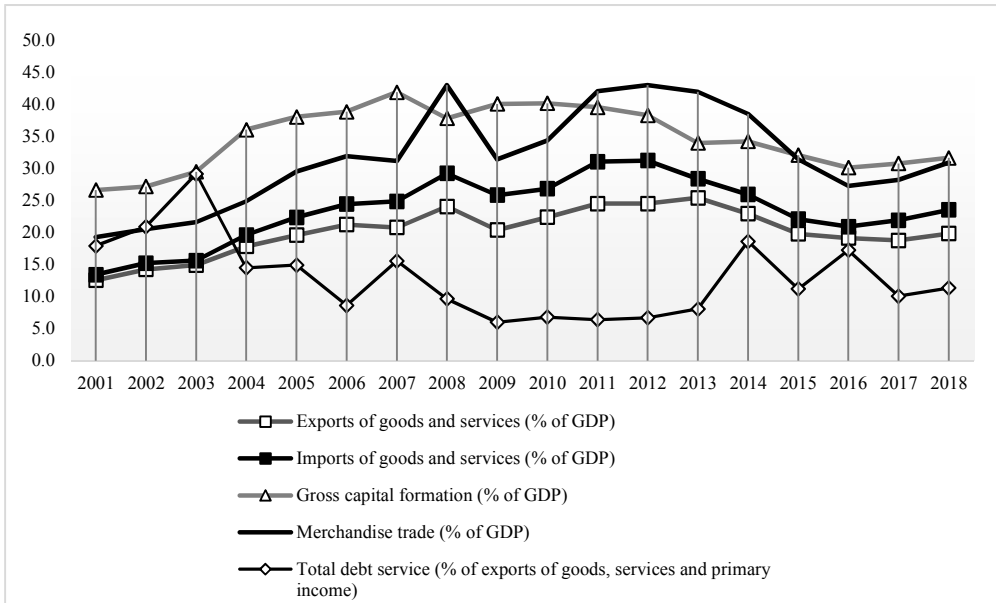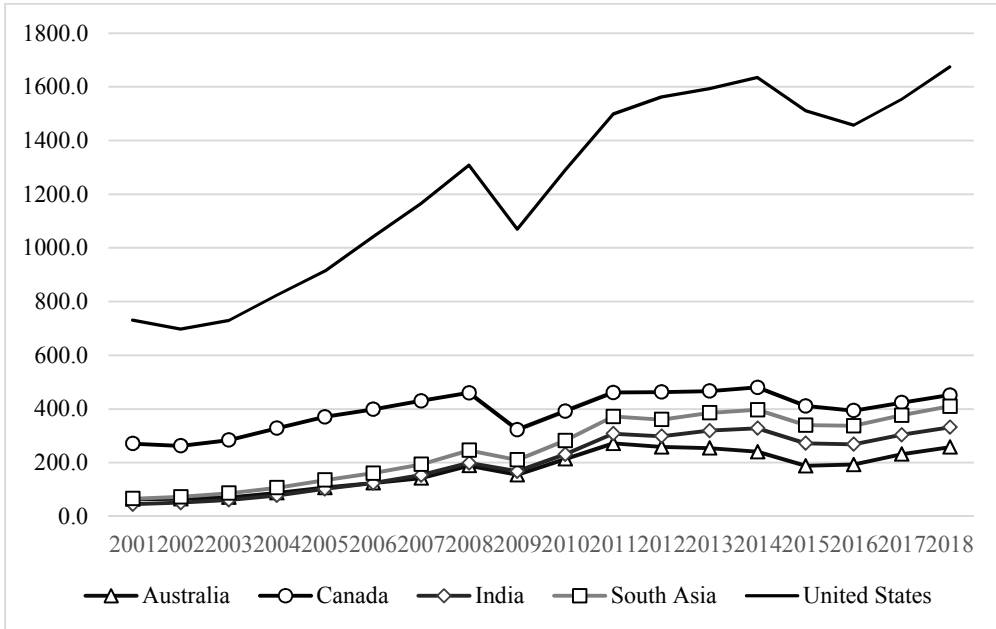
Figure 4. Important economic indicators performance for India

Figure 5. Goods Exports (Current, US$ Billion)

3. METHODOLOGY

The conventional gravity model discussed by Tinbergen (1962) facilitates explaining the bilateral trade flows between countries. The model's basic principle is that the trade volume between two countries is proportional to their gross domestic product (GDP) and inversely proportional to the distance between them. Prices are excluded from his basic model, as the approach studies equilibrium trade flows that result from the interaction of supply and demand, adjusting price as an endogenous variable. His basic gravity model is as follows:

$$T_{ij} = \alpha Y_i{}^{\beta_1} Y_i{}^{\beta_1} Y_j{}^{\beta_2} D_{ij}{}^{\beta_3}.$$

Here T_{ij} represents the total trade (both exports and imports) from country i to country j; Y_i is the GDP of country i; Y_j is the GDP of country j; D_{ij} refers to the geographical distance between countries i and j; and, α and β_s are parameters to be estimated. In the above equation, an important assumption is that trade costs depend on the geographical distance between countries.

However, it is rational to argue that trade costs are dependent not only on the geographical distance between countries, but also on other factors emanating from the existing institutional and infrastructural rigidities in both exporting and importing countries. These latter costs are defined as 'economic distance' in the literature Anderson (1979). It is also logical to argue that the macroeconomic policies pursued not only in the exporting country, but also in the importing country would affect the exporting environment of the exporting country. The theoretical channels, through which it affects the exporting environment of a country, would generally fall under the institutional and infrastructural rigidities. These rigidities include for example, factor markets, financial markets, exports competitiveness, political obstacles, and others.

It is in this context, Kalirajan (2007) has applied the stochastic frontier production function approach to the conventional gravity model to capture the institutional and infrastructure rigidities inherent in the exporting environment of a country. This method of stochastic frontier gravity model facilitates estimating the potential export level had there not been any institutional and infrastructural rigidities within the exporting country.

Drawing on Kalirajan (2007) the stochastic frontier gravity equation for exports over time can be written as follows:

$$\ln X_{ijt} = \ln f(Z_{jt}, \beta) \exp^{(v_{it} - u_{it})}, \tag{1}$$

where the term X_{ijt} represents the actual exports from country i to country j in time t. The term $f(Z_{jt}, \beta)$ is a function of the determinants of potential bilateral trade (Z_{jt}), and β is a vector of unknown parameters.

'Behind the border' constraints incur additional transaction costs on the smooth flow

of goods, such as institutional costs due to attitude of institutions, regulatory and legislative costs, policy choices, equipment and training costs, and political costs due to inability of the governments to take trade facilitation measures due to geo-strategic reasons. In addition, there could be fallouts due to policy choices as experienced under the COVID pandemic. For example, the health related measures such as social distancing directly adversely affected the trade costs. During GFC, the unobservable effects of the policy choices in the form of overall fiscal imbalances could have flown through the factor and financial markets. As has been observed during the GFC and COVID pandemic, the policy choices to pursue the fiscal deficit is a preferred choice to support the economy. In normal times, the 'behind the border' measures could range from product standards and conformity assessment measures, business facilitations, trade finance to hard (physical) and soft (regulatory) infrastructure such as efficient transport links and networks, logistics in the form of efficient freight forwarders, distributors, and efficiency of telecommunication system.

The 'behind the border' constraints, which are country-specific to the exporting country, creates the difference between actual and potential trade between the exporting and importing countries concerned. It is difficult to get full information on all 'behind the border' constraints that exist within the exporting country. Nevertheless, drawing on Kalirajan (2007), the combined effect of these constraints can be modeled as a random variable u_i that takes values between 0 and 1 and it is usually assumed to follow a truncated (at 0) normal distribution, $N(\mu, \sigma_\mu^2)$. When u_{it} takes the value 0, this indicates that the bias or country-specific 'behind the border' measures are not important and the actual exports and potential exports are the same, assuming there are no statistical errors. When u_{it} takes a value other than 0 (but less than or equal to 1), this indicates that the bias or country specific 'behind the border' measures are important, and they constrain the actual exports from reaching potential exports. Thus, the term u_{it}, which is bilateral observation-specific, represents the bias that is a function of the 'behind the border' constraints that are within the exporting countries' control. Thus, unlike the conventional approach, the suggested method of estimating the gravity model does not exclude the influence of 'economic distance' bias on trade flows between two countries.

The 'beyond the border' constraints can be divided into 'explicit beyond the border' constraints that are observable and 'implicit beyond the border' constraints, which are not observable. 'Explicit beyond the border' constraints, for example, can be measured from the applied tariffs and the exchange rate of the importing countries (Kalirajan and Singh, 2008). The 'implicit beyond the border' constraints emanate from institutional and infrastructural rigidities along with the policy choices that exist in the importing countries that are difficult to measure. It is assumed that the error term, 'v' captures the influence of omitted variables on trade flows and the 'implicit beyond the border' factors in addition to measurement errors that are randomly distributed across the observations in the sample. The 'Implicit beyond the border' constraints are not under the control of the exporting countries, and it is assumed that these are randomly distributed. These include all the non-tariff barriers and all sociopolitical and institutional factors in

addition to the effects of policy choices in the importing countries (Miankhel et al., 2014). In fact, the model formulation supports the assumption that 'v' is a double-sided error term with normal distribution of $(0, \sigma_v^2)$.

The maximum likelihood methods can be applied to either the cross-section or panel data to estimate the gravity model discussed above and to verify how important the 'behind the border' measures are in constraining trade between countries reaching from their potential levels.

$$Export\ Efficiency = \exp(X_{ijt})/\exp\{f(Z_{jt}, \beta) + v_{it} - u_{it}\}.$$

In other words, export efficiency is the ratio of actual exports to potential exports. The potential exports are determined after considering the 'behind and beyond' the border obstacles to trade that restrict a country from achieving its potential level of trade. The time component that appears in Equation 2 means that the export efficiencies vary over time. Such variations are due to the variations of the influence of the random component v_{it} and also due to the variation in the impact of the 'behind and beyond' the border constraints. In a time varying model, this over time effect is captured as:

$$\mu_{it} = exp\{-\eta(t - T_i)\mu_i\}. \tag{3}$$

In Equation (3), t refers to the initial starting period and T refers to the last period of the empirical analysis. η can take the value either > 0, < 0, or $= 0$. When $\eta > 0$, the inefficiency decreases over time; when $\eta < 0$, the inefficiency increases over time; and when, $\eta = 0$, the inefficiency remains constant over time Kalirajan (2007).

The 'γ' (gamma) coefficient, which is the ratio of the variation due to the influence of country-specific 'behind the border' constraints in India to the total variation in the dependent variable, is generated from the software. The large size implies that the 'behind the border' constraints are responsible for a large proportion of the mean total variation in the model. It also substantiates that including the combined effect of the 'behind the border' constraints in the conventional gravity model is important to explain the variation in India's export potential to its trading partners.

During any crisis, it is logical for the governments to adopt extra-ordinary measures involving fiscal, financial, and other measures to sustain the economies on the long-term growth path. These measures would affect the macroeconomic environment of the country, which will also exert influence on the exporting environment. Therefore, in the first stage, the augmented stochastic frontier model is estimated and the presence and pattern of inefficiencies over time is determined, in addition to determining the bilateral export efficiency level for each country over time. As the export efficiency levels are functions of government policies and in this specific post GFC scenario, the macroeconomic policies, we employ structural equation modelling (SEM) in the second stage to determine how these macroeconomic policies affect the export efficiency levels of the exporting country. As explained above, the policies both the 'behind   and 'beyond the border' would affect the exporting environment of home country, therefore,

we take into consideration the macro-environment conditions of both exporting and importing countries. For the second stage estimation, we use the economic freedom index (EFI)[1] in determining the effect of macro-economic conditions on the export efficiency levels[2].

The index to measure the macroeconomic environment in a country has been constructed by the Fraser Institute and measures the degree of economic freedom present in five dimensions, namely: (1) Size of Government; (2) Legal System and Security of Property Rights; (3) Sound Money; (4) Freedom to Trade Internationally; (5) Regulation. Within each dimension, there are several components and then within each component, there are sub-components. Overall, the index is comprised of 26 components and various sub-components (variables). In total, the index has 44 distinct variables (Appendix A). The data for each variable has been sourced from third party and is measured on a scale from 0 to 10[3]. The sub-component ratings are first averaged to derive the components ratings. The component ratings are then averaged to obtain ratings for each country EFI.

4. DATA SOURCES

The dataset consisted of 25 trading partners of India for the period 2010-2018. The GDP, population, GDP per capita, exchange rate, as well as GDP deflators for the empirical analysis have been obtained from the World development Indicators (WDI) of the World Bank. India's bilateral export with its selected trade partners was retrieved using the World Integrated Trade Solutions (WITS) from the UN COMTRADE database. The GDP and bilateral export statistics have been deflated to the base year 2001. For the analysis, the effective applied tariff rates have been used and downloaded from the Trade Analysis and Information System (TRAINS) using WITS. The bilateral trade weighted distances that have been used in the analysis are in kilometers and have been downloaded from www.cepii.fr/francgraph/bdd/distances.pdf. The EFI data has been obtained from the Fraser Institute website[4]. The EFI index for various countries is available until 2018. The computer software, STATA was used to estimate the stochastic frontier gravity model and to do the structural equation modelling for the efficiency model in stage 2.

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[1] https://www.fraserinstitute.org/economic-freedom/approach

[2] It should be noted that the economic freedom index directly influences the export efficiency and not the export levels, and the latter is directly influenced by the core variables, such as GDP, population, and distance.

[3] https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-2019-appendix.pdf

[4] https://www.fraserinstitute.org/economic-freedom/dataset?geozone=world&min-year=2&max-year=0& page=dataset&filter=0

5. RESULTS AND POLICY DISCUSSIONSFINDINGS

The stage 1 estimation results of the stochastic frontier gravity model for India's bilateral trade with its selected trading partners have been presented in Table 1.

Table 1: Post GFC India Stochastic Frontier Gravity Model

Model dependent variable real exports	Model (2010-18)
Constant	-1.4 (2.36)
GDP	0.74***(0.09)
Population	-0.34***(0.08)
Distance	-1.1***(0.21)
Exchange rate	-0.07 (0.21)
GDP per capita (india)	0.91***(0.28)
Tariff	-0.004(0.012)
μ	1.81***(0.32)
η	-0.04***(0.01)
σ^2	0.4 (0.12)
γ	0.91***(0.03)
σ_μ^2	0.36***(0.12)
σ_v^2	0.03***(0.003)
log Likelihood	-1.24
Wald Chi2	81.85
Observations	201

Note: Figures in the parentheses are standard errors of estimates. $*$, $**$, and $***$ represent significance levels at 10%, 5%, and 1%, respectively.

Table 1 shows that the estimate of 'γ' is large (0.91) and is significant at the 1 percent level. This implies how important is the combined effect of the 'behind the border' constraints in explaining the variation in India's export potential with respect to its trading partners in the stochastic frontier gravity model framework. The coefficient 'μ' (mu), which measures the impact of the 'behind the border' constraints to trade, is positive and significant at the 1 percent level. It signifies that during the post GFC period (2010-18), inefficiencies were present in the merchandise exporting environment of India. Moreover, Table 1 also shows that the coefficient of 'η' is negative and significant at the 1% percent level. This implies (Equation 3) that post GFC inefficiencies in the goods exporting environment of India have increased over time.

Table 1 depicts that India exports more to the countries with larger GDP. The

countries with larger GDP have more demand for goods and exporting countries try to export more to the countries with higher GDP to meet the demand and gain the market share. The positive and significant coefficient implies that the exporting countries try to concentrate on such markets to take advantage of the established distribution networks over there and economies of scale are achieved in production and supply of goods to such markets. The population coefficient is negative, which implies that either India trades more with the countries having less population or India is not able to meet the demand consistently with the increase in population in its trading partners. Both GDP and population parameter estimates if interpreted together also indicate that India's trading relations are intense with the countries having high GDP per capita. As a result, the US and EU are the major trading partners of India for merchandise exports. All the three coefficients of GDP, population, and the distance are significant at the 1 percent level. The distance coefficient is negative and revolves around 1 as expected implying that India's merchandise exports are focused on neighboring countries and as the distance increases, its bilateral trade decreases. Also, India has a regional focus in terms of its merchandise trade expansion. The figure 6 presents the summary of the results for India.
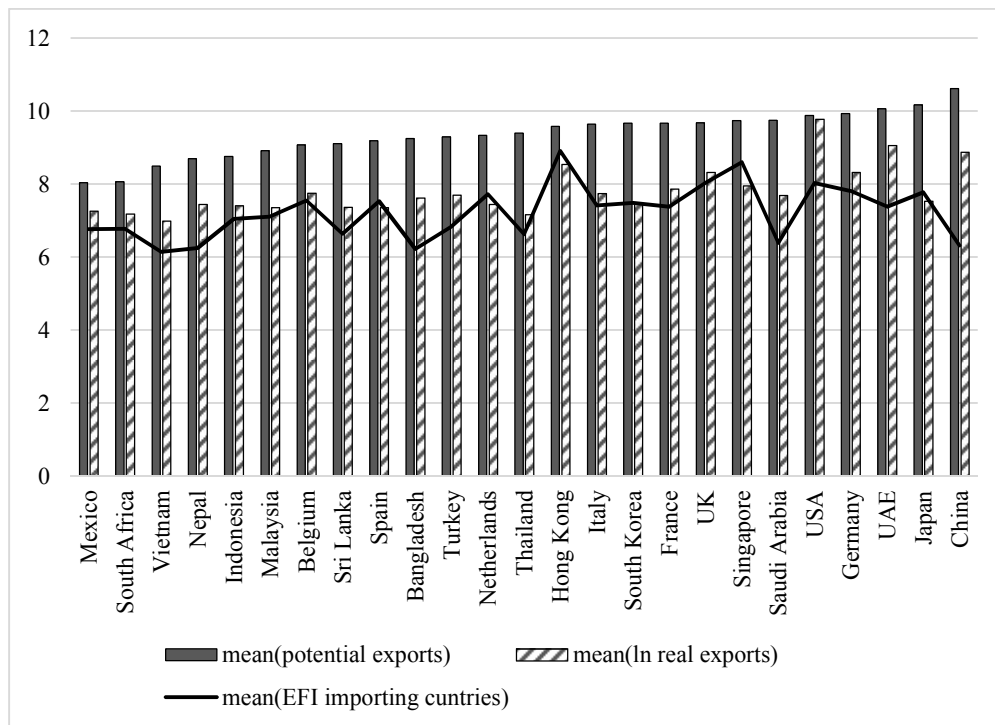

Figure 6. India Potential and Real Exports by Importing Country Environment
2010-2018

Figure 7. India Export Efficiency over Time (2010-2018)

The nominal exchange rate coefficient is not significant. However, it may indicate that India's exports have not increased during the period 2010-18 despite its nominal depreciation. There could be many reasons for this. For example, India's exports might constitute more of imported components, which may adversely affect the cost of the products in the export destinations or exporters may have to increase the cost of the products to maintain their profit margins. Also, there may be inefficiencies in the exporting environment of India on the supply side due to which exporters have not been able to respond positively to the opportunities provided by the nominal depreciation in the form of increasing their market share in the importing countries. Moreover, the GDP per capita coefficient of India is significant at the 1 percent level and is less than 1. India's GDP per capita in 2010 was US$ 1,358 which has increased to US$ 2,014 in 2019 at current prices. The GDP per capita variable is also indicative of the capital-labour ratio in the Indian economy, which has increased over time. As the coefficient is less than 1, it shows that India's exports have not been able to increase at the same level as the GDP per capita. More capital is being used in the production of goods and to keep pace with this rising transformation and India needs to spend more on R&D and innovate to increase its export volumes.

The sign for the effective applied tariff, which represents the 'explicit beyond the border' resistance to trade, is not significant. Recently, the focus of bilateral and multilateral negotiations has shifted from just removing trade barriers in the form of tariff reduction to facilitation and removing both the 'behind the border' and 'implicit beyond the border' constraints. At times, these constraints are explicit and other times these are unobserved, which would influence adversely the exporting environment and trade shares in the importing countries.

As already explained, 'the behind the border' constraints could be either due to inability to take remedial actions to counter the inefficiencies created at home due to importing countries policy actions that deteriorated the exporting environment of home country or it could be due to 'inherent inefficiencies in the home country itself. The importing countries policy actions create 'implicit beyond the border' constraints which adversely affect the expenditure share of exporting country in importing country thereby, restraining the exporting country to achieve its potential in the exporting country. The exporting country needs to take remedial action to maintain its competitiveness in the importing country, otherwise, inefficiencies will remain in the exporting environment of home country. On the other hand, there could be inherent inefficiencies in the exporting environment of home country itself that could be restraining the exporting country to achieve its exporting potential. Therefore, examination of inefficiencies at home and that generated due to policy actions of the importing countries is important in the analytical framework. The presence of inefficiencies in the exporting environment resultantly impacts the export efficiency levels. The EFI index provides an assessment of macroeconomic conditions both in India and in its partner trading countries that could help in modeling the exporting environment efficiencies as a function of home environment factors and of importing partner countries.

Table 2. Structural Equation Modelling (SEM) on Export Efficiency with Economic Freedom Index

	Model 1	Model 2	Model 3
Constant	0.87 (0.76)	0.78 (0.74)	0.71 (0.73)
Size of government	0.003 (0.08)	0.005 (0.08)	0.004 (0.08)
Legal system and property rights	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Sound money	-0.02*** (0.01)	-0.02*** (0.01)	-0.02***(0.01)
Freedom to trade internationally	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
Size of government ((importing countries)		0.01*** (0.003)	0.01*** (0.003)
Export freedom index (importing countries)			0.01**(0.005)
Log likelihood	345.31	74.6	-122.32
Observations	180	180	180

Note: Dependent variable is export efficiency and Period is 2010-2018. ∗, ∗∗, and ∗∗∗ represent significance levels at 10%, 5%, and 1%, respectively.

After estimating the year- and country- specific export efficiencies for India, the structural equation modeling (SEM), which provides more accurate and robust estimates than the ordinary least squares estimation, is employed to identify which of the macroeconomic variables in the EFI index for India and the importing countries are affecting the post GFC exporting efficiency of India. For within India, four dimensions of EFI were chosen as explanatory variables in the SEM, while for assessing the macroeconomic environment in the partner countries, the size of government of the partner country and overall EFI were added to the models as independent variables[5]. The estimation results have been presented in Table 2.

The Model 1 in Table 2 focuses on the exporting environment inefficiencies generated due to home environment macroeconomic conditions only. It shows that the coefficient of the variable 'sound money' in the Indian context is negative and is significant at the 5 percent level during the post GFC period of analysis. The sound money dimension in the EFI has been constructed based on four components namely (i) Money growth; (ii) Standard deviation of inflation;(iii) Inflation in the most recent year; and (iv) Freedom to own foreign currency bank accounts. The sound money variable has been calculated by taking average of the ratings of the above four sub-components.

The M1 money supply comprising checkable deposits and currency in circulation has been used to measure the growth rate of the money supply. The rating has been calculated as $(V_{max} - V_i)/(V_{max} - V_{min})$ multiplied by 10. The V_i represents the average annual growth rate of the money supply during the last five years adjusted for the growth of real GDP during the previous ten years. Vmin and Vmax values are set at

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[5] It is worth noting that the EFI influences directly the export efficiency and indirectly the levels of exports. Hence, the determinants of export efficiency is gauged separately.

zero and 50%, respectively. If the money growth was equal to the real output long-term growth, it implies that money grew at zero rate during the last five years generating a rating of 10. The more adjusted annual growth rate of money is, the less is the rating for money growth. Therefore, a higher rating of 'sound money' dimension on account of money growth adversely affects the circulation of money in developing countries context.[6]

Similarly, the rating formula for inflation and standard deviation of inflation is $(V_{max} - V_i)/(V_{max} - V_{min})$ multiplied by 10 which is used to determine the zero-to-10 scale rating for each country. In case of inflation, the Vi represents the most recent year inflation. The values for V_{min} and V_{max} were set at zero and 50%, respectively implying the lower the rate of inflation, the higher the rating. As the inflation rate moves toward a 50% annual rate, the rating for this component moves toward zero. In case of standard deviation of inflation, V_i denotes the country's standard deviation of the annual rate of inflation during the last five years. The values for Vmin and Vmax were set at zero and 25%, respectively for standard deviation of inflation. Therefore, countries that achieve perfect price stability earn a rating of 10. The higher rating would go to the countries with the least variation in standard deviation of inflation and lower rate of inflation. The freedom to own foreign currency accounts both domestically and abroad results in a rating of 10 while restriction would score it at zero.
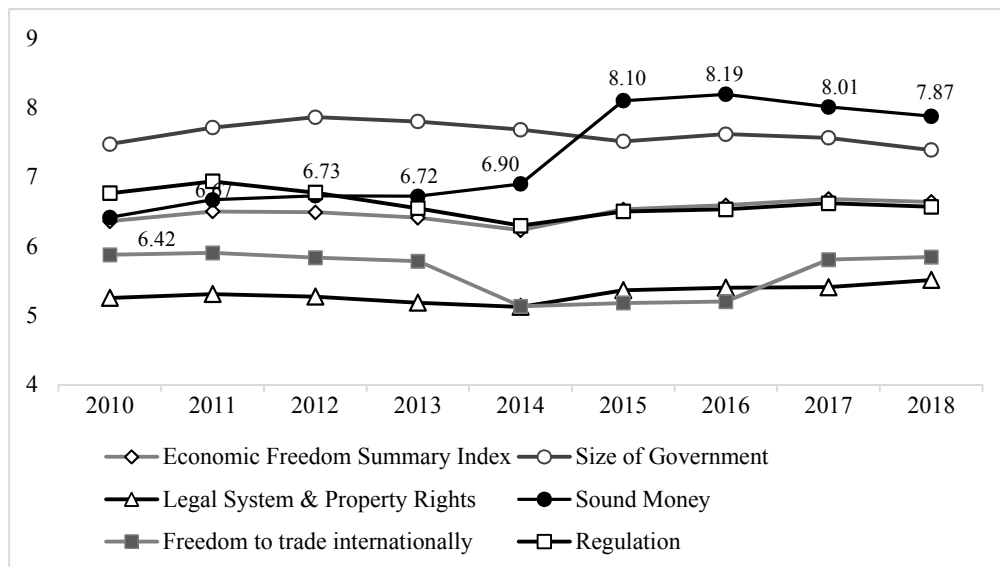
Source: Fraser Institute

Figure 9. India Economic Freedom Index

[6] https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-2019-appendix.pdf
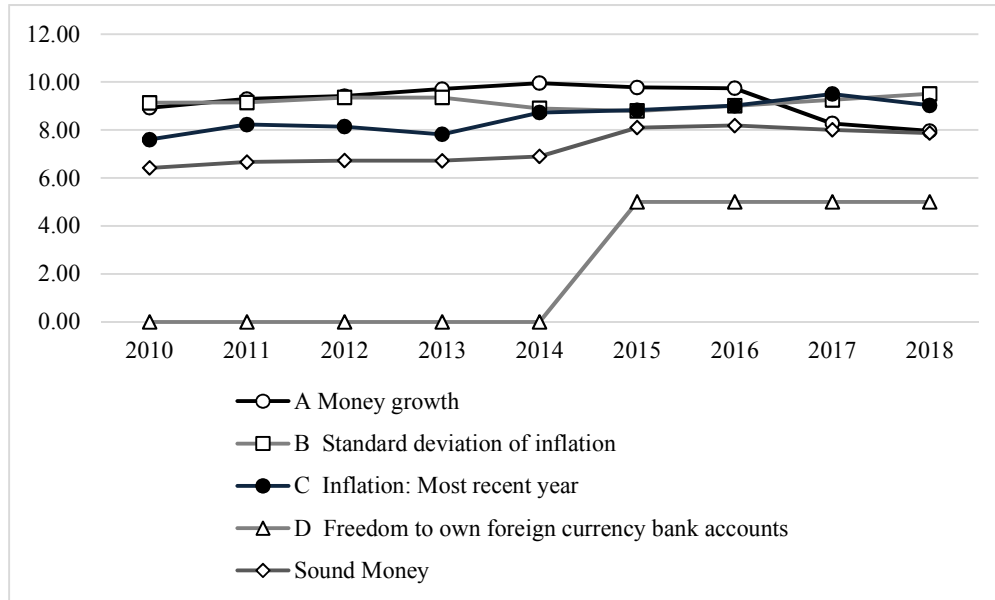
Source: Fraser Institute

Figure 10. Sound Money and Its Sub-Components for India

Figure 9 presents the performance of India in all the five areas of EFI for the period 2010-18. We can observe that while all the other three areas of EFI remained stable, only sound money and freedom to trade internationally experienced changes. The sound money exhibited an increase in its rating level since 2013 and showed a persistent behaviour. On the other hand, the freedom to trade internationally gone down during 2014-16 but regained its previous rating level in 2017. However, sound money is only significant at 1 percent level with a negative coefficient which implies that increased rating for sound money adversely affects export efficiency level of India exports. As already stated, sound money has four sub-components and rating for sound money is calculated as average of the ratings of four sub-components. Therefore, a country may not be performing well in one or more sub-components but high ratings in other components could lead to overall higher ratings for sound money.

Figure 10 presents the performance of four sub-components of the sound money. The figure shows that money growth started its downward journey since 2014. It means that GDP adjusted annual growth rate of money was more which resulted in lower ratings for money growth. The inflation rating, on the other hand, started improving since 2013 while the standard deviation of inflation rating slightly declined during 2014-15 and subsequently returned to its pre-2014 levels. There was a structural shift in ratings for freedom to own foreign currency bank accounts in 2014 as a lot of investment liberalization measures took place in India such as allowing foreign investment in

Limited Liability Partnerships (LLP), liberalizing investment policy in railway infrastructure, defense sectors and others [7]. As sound money is average of four subcomponents, we can observe in figure 10 that its rating has increased since 2014.

Subramanian (2019) while validating India GDP growth estimates highlighted shocks to the India economy during the period 2011-16 that adversely affected the GDP growth. The identified shocks had consequences on the exporting environment of India as India export growth fell to 3 percent compared to pre-2011 period of 15 percent. One shock identified was Twin Balance Sheet (TBS) problem as many companies invested heavily since 2000 that did not work leading to stress in corporate sector and double-digit levels of non-performing assets in banks. Consequently, firms were not healthy enough to invest while banks became reluctant to lend more. Moreover, the real credit growth to Industry slowed down to 1 percent compared from 15 percent in pre-2011 period. Even the small credit growth that took place was lent by banks to the firms for financing interest payments of stressed firms. Therefore, investment growth declined by 10 percentage points with possible adverse consequences for GDP in terms of 2½ to 3 percentage points in growth (Subramanian, 2019).

India also experienced drought for two consecutive years (2014-15) which negatively affected the food grain production. During these two years, the growth in food production was -4.9 percent and 0.5 percent which considerably below the long run average growth of 3 percent. The economy experienced macro-economic shock in November 2016 when 86 percent of money supply was reduced which affected the informal sector output that relies heavily on cash[8] (Subramanian, 2019). In addition, the key indicator of consumption, namely the Index of Industrial Production (IIP) for consumer goods also experienced a sharp decline in real growth from 9.2 percent (2002-2011) to 4.5 percent during 2012-16. The TBS problem which led to decline in the real credit growth to industry and to decline in investment, the demonetization drive of 2016 and fall in consumption, all adversely affected the money supply ratings. The negative estimated coefficient for the 'sound money' demonstrates that increased rating had an impact on the export efficiency in the Indian context during the period 2010-18. For India to improve its export efficiency level, it needs to focus on its industrial sector by promoting R&D and development of innovative products that would help India to retain its market share in export destinations. The focus on industrial sector which is responsive to global product developments in terms of innovations would help in bringing stability to the GDP adjusted money growth ratings through exports growth. It could also lead to increase in demand in factor and product markets and bring GDP deflator to its long-run levels.

[7] https://www.oecd.org/daf/inv/investment-policy/FOIinventorymeasures_Nov_2014.pdf

[8] Nevertheless, the Government of India claims the following about the fruits of "demonetisation" of ₹500 and ₹1,000 notes: fighting terrorism, "black money," gaining fiscal space, reducing interest rates, and formalising informal economy through digitization (PMO, 2016). http://www.pmindia.gov.in/en/newsupdates/prime-ministers-address-to-the-nation.

The size of the government and legal system and property rights coefficients for India are both insignificant. The coefficient for freedom to trade internationally is insignificant as its sub-components did not exhibit any significant movement during the period of analysis (2010-18) and mostly remained in the stable ranges namely; tariff 6.07-6.40, regulatory trade barriers 3.7-6.6, black market exchange rates 10 and controls of the movement of capital and people 0.66-0.7

After considering the macroeconomic factors at home that may have been adversely affecting the exporting competitiveness of India, Model 2 in Table 2 brings in size of government of the trading partners in estimation. Models 2 demonstrates that how simultaneous consideration of economic conditions in trading partners and in domestic economy affect the exporting environment of the home country. As mentioned before, the trade balance equation of Anderson (1979) facilitates this interaction. The Model 2 estimations show that all domestic economy variables (India) are stable after the introduction of size of the government variable for importing countries in the model. The coefficient for size of government is positive and significant at 1 percent level. .
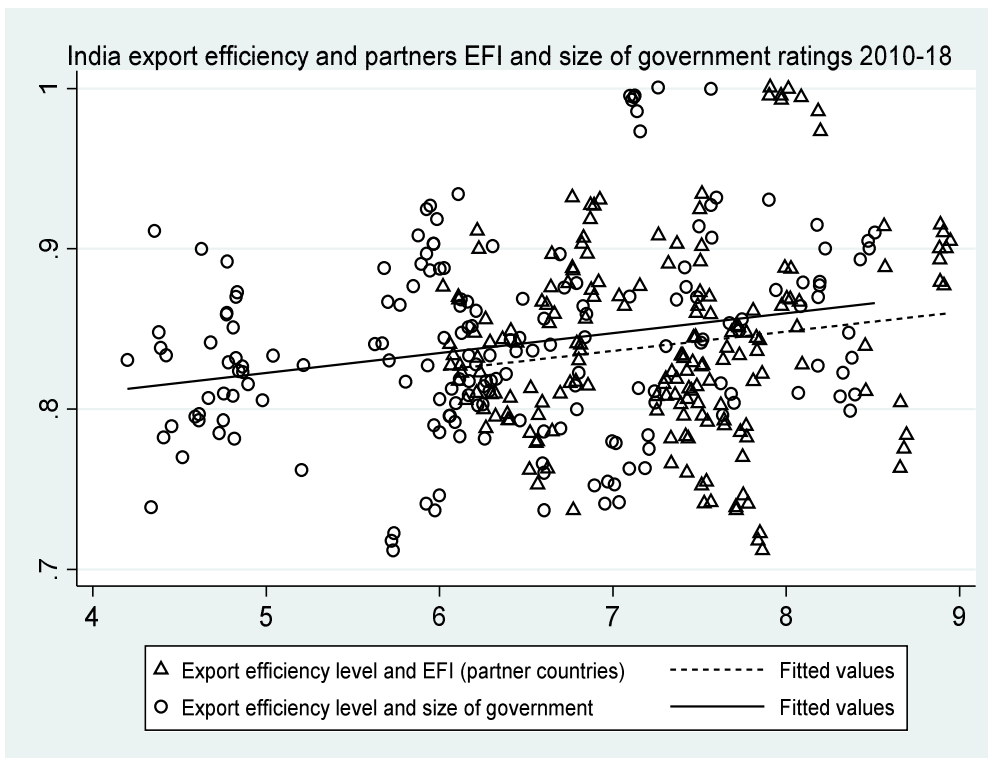

Figure 11. India Export Efficiency Level and Trading Environment in Partner Countries 2010-18

The positive sign of the size of the government of the importing countries in Table 2 informs that India export efficiency levels are high with major economies. Similarly, Model 3 in Table 2 introduces the coefficient for overall EFI for the importing countries which is also positive and significant at 1 percent level and of the same magnitude as size of the government. It implies that the improvement in the EFI in the importing countries facilitates India's export efficiency levels through increased goods exports. Figure 11 also shows the relationship between India export efficiency level and Importing countries EFI for the period 2010-18. Improvement in overall EFI means that stable macroeconomic environment in the importing countries facilitates competitiveness of India exports. Stable macroeconomic environment also envisages that trading partners having money supply near to long term GDP growth rate and low levels and variations in inflation.

During the COVID pandemic, most of the countries around the world have resorted to expansionary fiscal and monetary policies, the effects of which are different among the country groupings such as advanced economies and the emerging and developing countries. While the inflation has largely remained stable in developed economies, on the contrary, most of the developing countries experienced pronounced inflation. All these macroeconomic policy actions in the trading partner countries have an impact on the aggregate demand originating from the importing countries which has also been further compounded by the disruptions in supply chains in addition to already inherent inefficiencies in the home countries exporting environments. The empirical estimates demonstrate that India can take advantage of the markets in the countries where overall macroeconomic environment has remained stable.

The economies have not come out of the effects of COVID pandemic yet. Despite all these external and internal developments, it is choice of policy actions that domestic economy needs to take at home to remove 'behind the border' obstacles to take advantage of opportunities provided under the current circumstances. Within the COVID pandemic context, the empirical results guide that best strategy for Indian government is to focus on industrial development by bringing in innovations, R&D, product developments and adopt expansionary policies, thereby generating demand in both product and factor markets against the backdrop of pandemic driven aggregate demand and supply shocks. The loose monetary policy could help the exporters in the form of providing some bargaining power to reduce export price of the products to retain their market share in the export markets. It could also help in reducing the financial costs to not only innovate quality products but also overcome increased shipping cost and maintain the competitiveness of export products.

It has become evident that inefficiencies in India's exporting environment in the post GFC period have aggravated in intensity over time and there is likelihood that COVID pandemic would have further worsened it, had the appropriate policy actions not taken in time by the Indian government. As crises provide opportunities for innovation and setting new normal, the negative sign on the 'sound money' also guide that expansionary policy measures targeted at exporters could be used appropriately to reduce the level of

inefficiencies in the exporting environment of India. Also increased spending in the developed countries with a stable macroeconomic environment provide an opportunity for India to increase its market share. Therefore, India needs to tailor its policy choices towards improving the macroeconomic environment for the merchandise exporters.

6. CONCLUSIONS AND POLICY IMPLICATIONS

The channels, through which any crisis would spread its impact on the economy, among others, are aggregate demand and supply shocks, policy choices, tariffs and non-tariff barriers, distortions in the factor markets, restrictions in movement of people and goods, exchange rate movements. Consequently, the crises are bound to adversely affect the competitiveness and the exporting environment of the exporting countries. The COVID pandemic resulted in global output contraction in 2020 which was followed by a fall in revenues that led to increase in government debt and deficits. The pattern of global debt and overall fiscal balance is similar as during the GFC. However, it is rather more pronounced during the COVID recessionary impact in 2020. The governments resorted to fiscal and financial support measures to mitigate the recessionary effects of crisis and position the economies on the path to recovery as they did during the GFC. These extraordinary intervention measures have the potential to generate inefficiencies in the exporting environment and thereby in the export efficiency of a country due to deviations from a normal growth path.

The empirical results have shown that crisis provides opportunities and expansionary policies which in normal times would have been a difficult policy choice could be used to reduce the inefficiencies in the exporting sector. The important point for consideration is how the expansionary policies could be targeted towards the exporting sector as during crisis, different views emerge for directing resources towards competing priorities. Moreover, the countries are still fighting against the spread of the COVID-19 and all the intervention policies will influence export efficiencies of exporting countries. Therefore, apart from designing the interventionist policies at home as response to external policy actions during the crisis period, there is also a need to benchmark a baseline to provide guidance on subsequent analyses in the post COVID era, in this context the post-GFC period can serve as a benchmark. The extraordinary measures adopted by the Indian Government during the crisis could have an adverse effect on the exporting environment which may be due to adverse selection of targeted policies Therefore, for a baseline comparative analysis, it is also important to investigate the inefficiencies already prevalent in the years preceding the outbreak of the COVID pandemic in India.

The empirical results of the model demonstrated that inefficiencies were already inherent in the merchandise exporting environment of India before the outbreak of the COVID pandemic. The extraordinary measures adopted during the GFC and in

subsequent years in addition to global demand conditions played an important role in the creation of inefficiencies in the post GFC period. The inefficiencies later increased over time due to government choices for certain policies that further deteriorated the exporting environment. The empirical analysis has highlighted that inefficiencies were still existent when the COVID pandemic broke out. Therefore, India needs to make policy choices, which should guide and lead India to its long-term growth trajectory The analysis and the policy suggestion of this study is also valid for any developing countries when dealing with the COVID-19 pandemic.

APPENDIX

Economic Freedom Index Components

1. Size of Government
    A. Government consumption
    B. Transfers and subsidies
    C. Government enterprises and investment
    D. Top marginal tax rate
        (i) Top marginal income tax rate
        (ii) Top marginal income and payroll tax rate
    E. State ownership of assets
2. Legal System and Property Rights
    A. Judicial independence
    B. Impartial courts
    C. Protection of property rights
    D. Military interference in rule of law and politics
    E. Integrity of the legal system
    F. Legal enforcement of contracts
    G. Regulatory costs of the sale of real property
    H. Reliability of police
    I. Business costs of crime
    J. Gender Disparity Adjustment
3. Sound Money
    A. Money growth
    B. Standard deviation of inflation
    C. Inflation: most recent year
    D. Freedom to own foreign currency bank accounts

4. Freedom to Trade Internationally
    A. Tariffs
        (i) Revenue from trade taxes (% of trade sector)
        (ii) Mean tariff rate
        (iii) Standard deviation of tariff rates
    B. Regulatory trade barriers
        (i) Non-tariff trade barriers
        (ii) Compliance costs of importing and exporting
    C. Black-market exchange rates
    D. Controls of the movement of capital and people
        (i) Foreign ownership / investment restrictions
        (ii) Capital controls
        (iii) Freedom of foreigners to visit

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