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The Global Economic Diversification Index 2022

Global Economic Diversification Index

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Overview

The pandemic has triggered a sharp decline in oil and commodity prices, bringing to light the severe structural weaknesses of most commodity producers and exporters, who are faced today with growing economic pressures. Additionally, the economic fallout from the COVID-19 pandemic adds to a series of long existing economic stressors such as rapid digitization, geopolitical shifts, environmental pressures, and new dynamics triggered by the fourth industrial revolution, amongst others. These systemic shifts call for governments and policy makers to urgently find new ways to diversify their economies away from commodities and to develop innovative policy responses to address current and future challenges.

The Global Economic Diversification Index (GEDI) by the Mohammed Bin Rashid School of Government is a pioneering project seeking to capture the multi-dimensional facets of economic diversification and ranks countries based on their level of economic diversification. It aims to understand the nature of economic diversification and the factors that directly or indirectly impact a country's overall level of diversification. The Index, based solely on quantitative measures with no perception indicators, provides a quantitative benchmark and ranking of economic diversification efforts of countries from across the globe.

While there is wide acceptance of and comment on the need for greater economic diversification, there is no agreed or available measure or index of economic diversification. The GEDI, therefore, represents a significant innovation to and an valuable tool for the analysis, discussion and policy work related to economic diversification. The GEDI is 'reproducible research', based solely on publicly available data and information. As a composite index, the core of the EDI consists of a single, summary measure of a country's economic diversification performance, thereby providing a basis for cross-country comparison. The EDI helps identify the level and breadth of economic diversification of a given country by combining and aggregating three dimensions of economic diversification: Production & Output Diversification, Trade Diversification and Government Revenue Diversification.

The annual Index and Report are to be published for the first time in 2021 and will be reviewed and updated on an annual basis, helping track, overtime, the results yielded by countries' diversification efforts.

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Foreword

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Introduction

Brief: Why is economic diversification important? How has it varied over time? How it has impacted developed LICs? Fundamentals of diversification. Case of GCC nations

Countries with plentiful natural resources tend to suffer from the Natural Resource Curse (also known as the Paradox of Plenty) referring to the paradox that countries and regions with an abundance of natural resources, specifically non-renewable resources like minerals and fuels, tend to have lower and more volatile economic growth (e.g. some Middle Eastern nations in the 1980s reporting negative growth) and worse development outcomes than countries with fewer natural resources.

Sachs and Warner (2001) found that resource-rich economies tend to grow more slowly, and lag, on average, behind resource-poor economies, with a robust negative relationship between real GDP growth per capita and the ratio of resource exports to GDP in a sample of 97 developing countries over the period 1970–1989. The paper also finds that a one standard deviation increase in primary products export share reduced the country's growth rate by 0.6-1.5 percentage points.

(Chart primary exports - fuels + non-fuel primary products - as % of GDP, GDP growth rate per capita 2000-2019)

The natural resource curse is also associated with so-called "Dutch disease" whereby the concentration of income from natural resource exports damages a nation's non-natural resource, productive economic sectors by causing an increase of the real exchange rate and wages. This pattern was evident in the Australian gold booms in the 19th century, oil rich nations in the early 70s and Colombian coffee in the late 70s among others. Real exchange rate appreciation weakens competitiveness of the country's exports, and causes its traditional export sector to shrink - together labelled the spending effect. Harding and Venables (2013) find that the response to a resource windfall is to decrease non-resource exports by 35–70%. This goes hand-in-hand with the resource movement effect i.e. resources (capital and labour) shift to the production of domestic goods that are not traded internationally (e.g. construction industry) - to meet the increase in domestic demand - and to the booming natural resource sector, thereby resulting in a decline in production in the traditional export sector. Ismail (2010) revealed that a 10% oil windfall is on average associated with a 3.4% fall in value added across the manufacturing sector. Various Sachs (1995, 1999, 2001) papers show the impact of wealth shocks creating excess demand for non-traded products and driving up input costs and wages.

While the resource sectors tend to generate large financial revenues, it is unlikely to generate commensurate jobs (either direct or indirect) given its intensive capital nature and inability to create few forward and backward linkages; this results in limited spillover effects on the rest of the economy, also minimising productivity gains. Gylfason (2001) finds that commodity resource abundance also crowds out human capital, entrepreneurial activity and innovation (discouraged by rent-seeking behaviour).

The rentier state argument is important in this context. Building on Hossein Mahdavy's analysis of Iran, where he defined rentier states as nations that received substantial amounts of external rents on a regular basis, Beblawi (1987) extended this to a wider concept of a rentier economy. The rentier economy is characterized by: (a) rent situations predominate in a rentier economy; (b) given reliance on substantial external rent, the nation can sustain without a strong domestic productive sector; (c) in a rentier state, majority of the working population is involved only in the distribution or utilization of the rent (and not in its generation); and (d) the state's government is the principal recipient of the external rent. One of the common tenets associated with a rentier model is "no representation without taxation". Most oil-rich rentier states have relied on a combination of rents and minimal taxation for their state revenues, and when levied, it is from its own agencies (for example, state-owned companies in the oil sector) and foreign companies[1].

More recent empirical analysis have called into question whether the "resource curse" hypothesis holds true, with papers (Gylfason, Herbertsson, and Zoega's (1999), Mehlum et al (2006), Lederman and Maloney (2007), Bravo-Ortega and de Gregorio (2007) and others) emphasizing the role of institutions in determining the path of economic development of resource abundant countries. Frankel (2010) finds that "endowments of "point source" commodities (oil and minerals and some crops) can lead to poor institutions, such as corruption, inequality, class structure, chronic power struggles, and absence of rule of law and property rights". Indeed, some resource-rich nations have performed better than others in both economic development and resource wealth management (examples of Norway and Indonesia versus Nigeria and Venezuela). Bjørnland and Thorsrud (2014), using a Bayesian Dynamic Factor Model (BDFM) for Australia and Norway find that a booming resource sector has substantial productivity spillovers on non-resource sectors.

The bottom line is that natural commodity dependence leaves countries vulnerable to commodity market and price shocks and volatility, raising exposure to adverse external shocks and vulnerability to macroeconomic instability. There are two major impacts related to commodity-price fluctuations: one, export revenues increase (decrease) as commodity price increases (decreases) and could lead to large terms-of-trade variations; two, increase in

[1] In recent years, many of these oil-exporting nations have introduced taxes and embarked on a phased removal of subsidies. This runs contrary to the "social contract" stipulations in the rentier state literature. Krane, in a chapter on "Subsidy reform and tax increases in the rentier Middle East" (https://www.bakerinstitute.org/files/13993/), suggests that social contracts are "less rigid than portrayed in the rentier literature".

government spending during a price boom and reduction when prices drop: this procyclicality has been observed extensively in oil producing nations, and is at times accompanied by a reduction in capital spending to finance deficits.

(Chart with commodity prices over time; oil, gas, gold, coffee)

Erbil (2011) finds that while fiscal variables are strongly procyclical in oil producing countries during the period 1990-2009, government expenditure is procyclical in the low and middle-income countries and countercyclical in the high-income countries. The difference seems to stem from external financing constraints as well as political and institutional factors. Oil stabilization funds, which accumulate windfall government revenues, have been increasingly used by oil producing nations as an instrument to cope with oil revenue volatility.

Furthermore, fossil-fuel subsidies are a substantial drain on government finances in many of these nations. Coady et.al. (2019) finds that "pre-tax subsidies" (i.e. energy consumers pay prices that are below the costs incurred to supply them with this energy) is highest in the Middle East, North Africa, Afghanistan and Pakistan (MENAP) region at USD 152bn followed by the CIS nations (USD 49bn); post-tax subsidies (sum of pre-tax and tax subsidies; it "reflects differences between actual consumer fuel prices and how much consumers would pay if prices fully reflected supply costs plus the taxes needed to reflect environmental costs and revenue requirements") accounted for 13% of regional GDP in MENAP, largely due to the substantial undercharging for supply and environmental costs of petroleum. Fiscal gains from removal of subsidies for the MENAP region is estimated at around 22% of government revenue and around 7% of regional GDP.

Economic diversification is key to addressing these macroeconomic stability, economic growth, and development issues. To address these risks, the GCC and other commodity exporters have focused on economic diversification as a policy priority and objective of their economic strategies.

Two major questions that need to be answered include: (a) What are the benefits of economic diversification? (b) How can nations diversify?

Benefits of Economic Diversification

Economic diversification leads to more balanced economies and is key to sustained economic growth and development. For the GCC and other fossil fuel producers and exporters it would help reduce exposure to volatility and uncertainty in the global oil market and avoid the related boom-bust cycles. More diversified economies are less volatile in terms of outputs, while lower output volatility is associated with lower economic uncertainty and higher economic growth prospects.

Economic diversification can further support:

a) re-orienting economies towards more knowledge based and innovation-led activities.
b) greater private sector activity, including in the tradables sector.

c) lead to greater skill diversity in the labour force, job creation, raise productivity growth and generate more sustainable growth.
d) provide more sustainable public finances that are less dependent on revenues from natural resources.
e) generate greater overall macroeconomic stability including disposable income and consumption.

How do nations diversify?

Theories of economic growth start from the very basic classical growth which posits that country's economic growth will decrease with an increasing population and limited resources. Neoclassical growth theory takes it a step further stating that a steady economic growth rate is a function of the inputs labour, capital and technology. The Solow-Swan growth model is the most popular.

In contrast, endogenous growth theory postulates that growth is generated due to internal factors (not exogenous factors like technological progress). Economic diversification is intrinsically linked to **structural transformation** e.g., a shift from agriculture towards industry (in the 60s-70s), and with increased globalization, a move towards services. Endogenous growth theory literature also highlights the importance of the nature of the sector in which a country specializes, as the returns to scale depend on the sector itself. Such transformations are welly documented: many of today's highly industrialized nations (e.g., East Asian nations) have seen massive transformations from their predominantly agriculture-based economies towards creating new, higher productivity, jobs in mostly urban economic activities that facilitate growth. In recent decades, there has been a similar move from manufacturing towards services – the latter now accounts for much of the value added and most of the employment in OECD countries. Successful production diversification involves resource reallocation across and/or within industries from low productivity activities to those with higher productivity and higher value added.

Increases in income per capita at early stages of development are typically accompanied by a transformation in a country's production and export structure. Imbs and Wacziarg (2003) explore the sectoral concentration relative to levels of per capita income and find a U-shaped pattern: as countries' levels of GDP per capita increase, the sectoral distribution of economic activity diversifies but relatively late in the development process, at a transition point, sectoral distribution moves back to re-specialization. Essentially, economic development is associated with increasing diversification rather than specialization in lower- and middle-income countries. Bahar and Santos (2018) find that natural resource rich countries tend to be outliers in the income per capita versus concentration of exports relationship: not only do a larger share of natural resource exports increase non-resource export concentration, but also that capital-intensive export products (versus labor-intensive ones) tend to dominate the export baskets of such nations.

The introduction of technology into the mix could make a difference as well: use of new technologies could lead to greater automation (for example, within agriculture, enable the

move to higher productivity activities or the move to 4th Industrial Revolution), more innovation and allow countries to catch up to the "technology frontier" - which can lead to greater diversification and structural transformation.

Hidalgo et al. (2007) and Hausmann et al. (2014) suggest that countries diversify by moving from products they specialize in to others that require similar capabilities and hence occupy an adjacent "product space." A "complexity" index is created that includes both the export diversity of the countries that produce it, and the number of countries that export it. Natural resources appear in the low-density part of the product "forest" relative to other goods, and might therefore offer fewer possibilities for jumping to other industries making it the single most difficult category of goods to diversify from. Crude oil has by far the lowest rating of all products - followed by tin ores and cotton. Ahmadov (2014) and Lederman and Maloney (2012) also find that among primary commodities, oil is most strongly correlated with export concentration.

Additionally, as participation in global value chains (GVCs) expands, countries can create value by focusing on intermediate products/ inputs and not necessarily on a final complete product. There are two kinds of GVCs: (a) simple, wherein the input crosses the border once for production i.e., use of steel in buildings; and (b) complex, where it crosses the border at least twice e.g., iPhone. Studies have found that participation in GVCs promotes not only output growth, but also productivity growth across sectors. However, data limitations (e.g., OECD-WTO TiVA database, Eora MRIO database) do not allow an analysis for time series, cross-sectional data.

If a country's production is unbalanced in favour of a particular sector/ product, especially in resource-rich countries, growth tends to fluctuate along with the price of these commodities. Conversely, the more diversified, the less vulnerable is a nation is to swings in in product or natural resource prices. Similarly, countries that are highly dependent on the export of one or a set of commodities or have a limited number of trading partners are relatively more vulnerable to external shocks. Empirical studies finding that resource dependence undermines long run economic performance are aplenty. Often, smaller, land-locked nations tend to be concentrated in particular sectors – on agricultural or mineral products - making them more vulnerable to sector-specific shocks: this creates further challenges as they embark on a diversification plan.

The policy challenge is how to successfully turn resource rents into an engine of growth rather than a barrier to development, avoiding the "resource curse". There have been examples of countries overcoming natural resource dependence: Norway, Australia, Chile, Malaysia are a few examples. So, what set them apart? Analysis combining both economic, structural, and institutional factors is likely to provide the answer. Among macroeconomic variables that act as drivers of diversification are real exchange rate (overvalued exchange rate, via reduced profitability, will discourage entry of investors into new economic activity/ products), inflation (negative relation with private sector development), net inflows of foreign direct investment (impact depends on the existing stock of FDI and the stage of diversification – a U-shaped

relation), terms of trade (higher the terms of trade, the greater the export concentration), and investment as a share of GDP (positive impact on diversification). Greater trade liberalization and higher access to finance support export diversification while structural factors like population, human capital (via specialization, increased skills, level of innovation and higher productivity), infrastructure, and institutions also nudge economic diversification. This will be explored in the next phase of the diversification project. The initial phase is limited to generating an index that quantifies countries' diversification journey.

Chapter 1. Constructing the GEDI

Brief. Literature review: output, trade, revenue. Identifying the variables + 3 main pillars

Measuring Economic Diversification

Background on Constructing the Global Economic Diversification Index (EDI)

Measuring Diversification: the EDI's approach and methodology

Chapter 2. Methodology

Brief: Section on construction of index, methodology

This chapter presents the methodology behind the Economic Diversification Index (EDI). It first addresses general issues in developing this kind of index, then presents the specific solution adopted. Finally, it provides an overview of how the sub-indices and overall index are computed.

Conceptualizing and Realizing the EDI

Data Pre-Treatment

Assessment of Candidate Methodologies

Overview of Methodologies

Selection

PCA Output

Chapter 3. Economic Diversification Scores, Index and Sub-Indices

Global rankings + regional performance + 3 case studies: successfully diversified, not diversified at all & the UAE

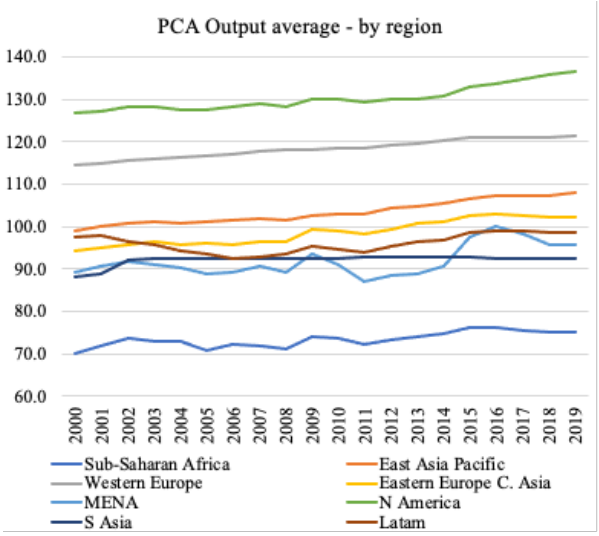
Global rankings over time

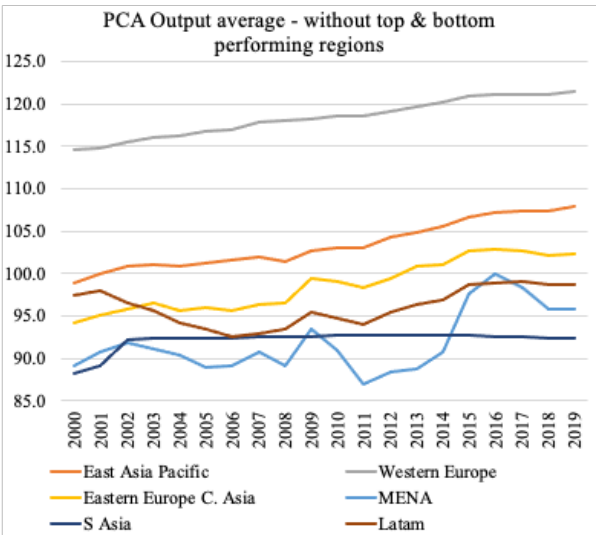
Table: Top 10 nations, by overall EDI Score

2000	2004	2008	2012	2016	2019
United States	**United States**	**United States**	**United States**	**United States**	**United States**
Germany	**Germany**	**Germany**	**Germany**	**Germany**	China
Japan	**Japan**	**Japan**	China	China	**Germany**
Switzerland	**United Kingdom**	**United Kingdom**	**Japan**	**Japan**	**United Kingdom**
United Kingdom	**France**	**France**	**United Kingdom**	**United Kingdom**	Ireland
France	**Switzerland**	**Switzerland**	**France**	**France**	**France**
Italy	Italy	**Singapore**	**Switzerland**	**Switzerland**	**Japan**
Singapore	**Singapore**	Italy	**Singapore**	**Singapore**	**Switzerland**
Ireland	Belgium	Belgium	Italy	Netherlands	Netherlands
Belgium	Netherlands	Netherlands	Belgium	Ireland	**Singapore**

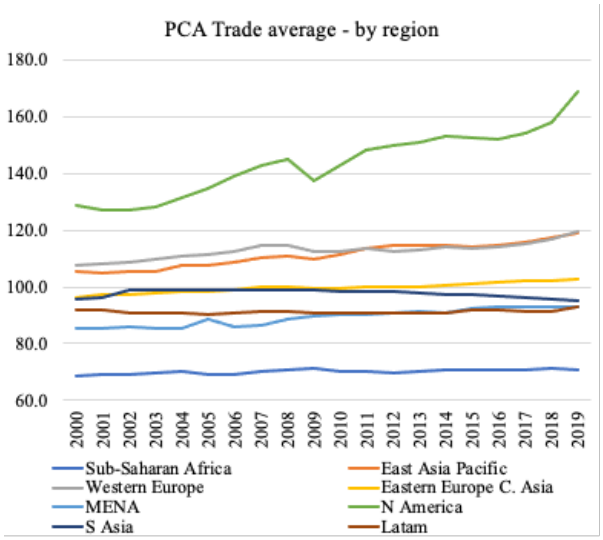
Regional performance over time

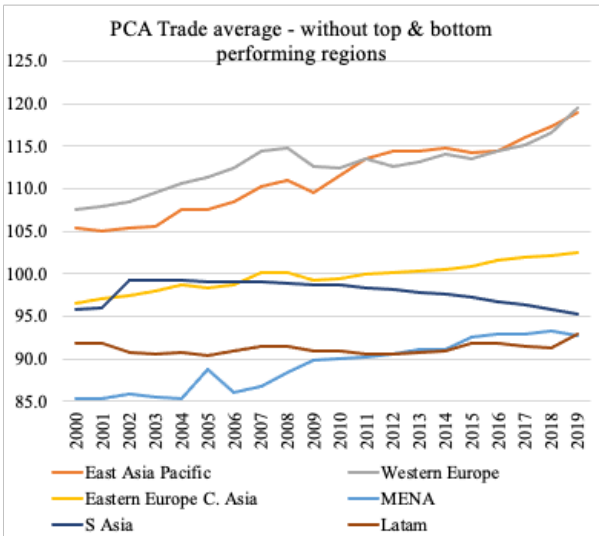
Output Diversification



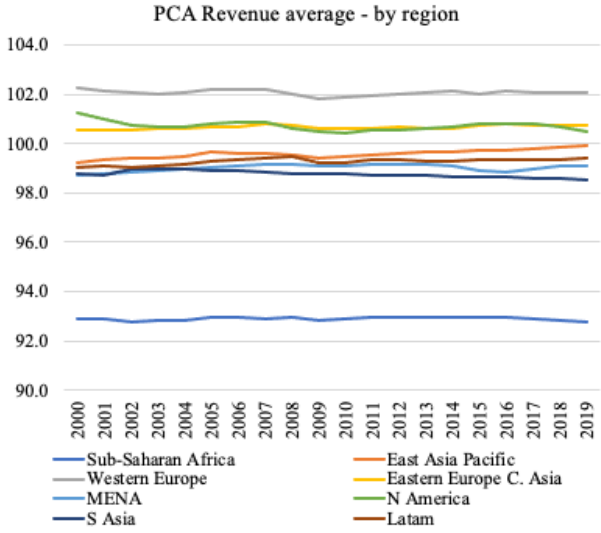


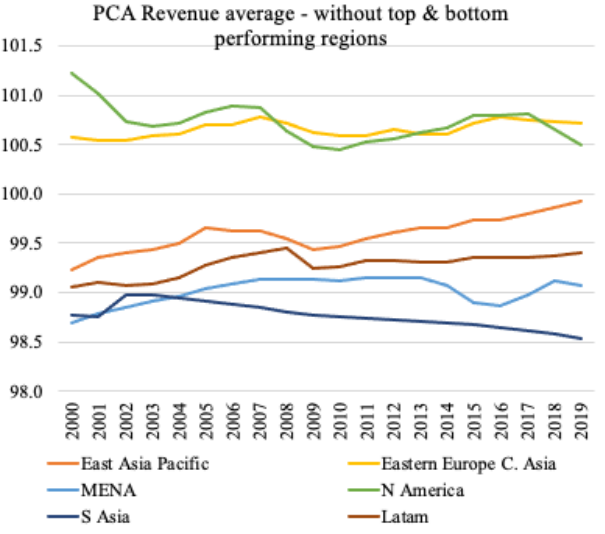
Trade Diversification



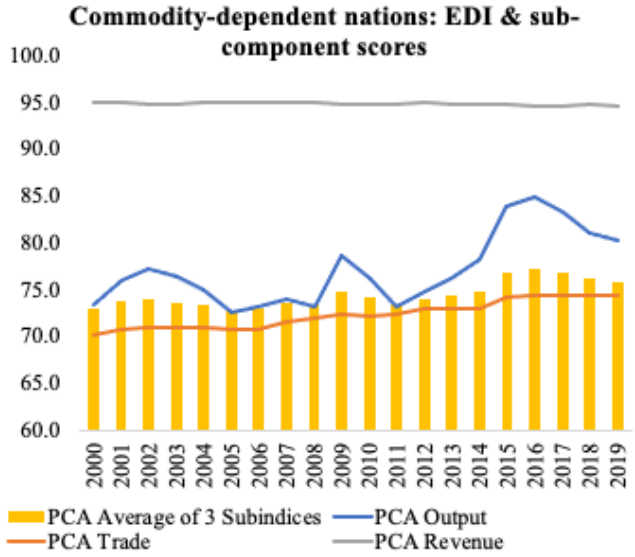


Revenue Diversification





Commodity dependent nations' EDI performance



Income-class groupings performance over time

Conclusion

Appendix

Appendix 1: Mathematical Notes

Appendix 2: Data Sources

1. *Indicator Name*

Source	Name
Details	What it actually measures
Website	URL
Unit	
Definition	
Date extracted	
Unavailable data	Flag missing data points
Latest available datapoint	
Comment	Outline additional data sources used for missing data

Appendix 3: Data Limitations

Select bibliography