Vulnerability of Arab economies from concentrated trade and agriculture

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Vulnerability of Arab economies from concentrated trade and agriculture

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Key messages

- *Three main sources affect growth sustainability in developing economies in general and Arab countries in particular, namely reliance on a few low-value-added commodity exports, such as oil and gas; reliance on a few service exports, mainly tourism receipts; and relatively high dependence on agriculture, fisheries and forestry sectors. The trade and agriculture vulnerability index (TAVI) proposed in this paper measures countries' economic vulnerability to these sources.*

- *Resource-rich Arab countries incurred high rank losses on the TAVI compared to GNI per capita, however, some Arab countries scored gains in their ranks.*

Contents

List of figures

Introduction

More diversified and knowledge-based economies are generally less vulnerable to income losses from demand or supply side shocks. They also have a larger productive capacity and more opportunities for decent work, which is essential for sustained growth in household incomes and savings. In these respects, their economies are more resilient to a variety of shocks. By contrast, low economic diversification and a lack of decent work opportunities are endemic economic policy challenges facing many developing countries.

In Arab countries, which are the focus of the present paper, excessive reliance on fuel exports has also created immense macroeconomic and political-economy challenges. Shocks caused by domestic or regional conflicts, droughts and natural disasters, or from global events such as the COVID-19 pandemic and the war in Ukraine, have also severely affected food-importing oil-poor Arab countries. Accordingly, there are two major sources of economic vulnerability facing Arab economies, namely their reliance on concentrated commodity and/or service exports (mainly crude oil and tourism), and/or domestic agriculture that still holds a significant share of production and employment in low-income countries such as Mauritania, Somalia and the Sudan. As dependence on these sources is also prevalent in many other countries, the main purpose of the present paper is to estimate the level of such vulnerability in the Arab region compared with other developing economies, especially oil-rich ones facing similar economic sustainability challenges.

The present paper undertakes its analysis for 2018 and thus does not include trend analysis, as the main objective is to propose a measurement framework and conduct a snapshot of the results rather than to assess the impact of the COVID-19 pandemic, which would require a more detailed study.

A second purpose of the present paper is to provide inputs for a larger and more ambitious ESCWA proposal, which eyes the construction of a more comprehensive measure of economic resilience, where vulnerabilities from traditional trade and agriculture sources are only one of three components, and with more updated trend analysis. The other two components are vulnerabilities from a lack of integration and preparedness for the knowledge economy, and exposure to financial sector risk and fragility.

The present paper is structured as follows. Section 1 sets out the conceptual framework and introduces a trade and agriculture vulnerability index (TAVI), which is relatively easy to construct and targeted to a non-technical audience. Section 2 summarizes the main results of applying TAVI to 131 countries, and undertakes score and rank correlations with other related economic indicators to draw out key stylized facts for Arab countries. The paper ends with some concluding remarks.

1. Framework and methodology

A. Growth vulnerabilities from concentrated trade and agriculture

Conventional economic development narratives based on growth in gross national income (GNI) per capita conceal the sustainability challenge. Income per capita cannot distinguish between countries that are highly dependent on limited and volatile sources of economic growth and others that have a more resilient productive basis. In other words, it focuses only on the outcome of the current growth process, rather than its future "sustainability". However, there is also broad consensus that the quality or trajectory of past and current growth process is a fundamental determinant of its future pathway. In all developed countries income per capita growth was accompanied by a pattern of structural transformation from low to high value-added sectors, and as a result higher diversification of growth sources and lower vulnerability to economic shocks.

In the current global economic context, this structural transformation and sustainability of national income remains a major challenge, especially for poorer developing countries. A key reason for that is the vulnerability of these economies to external revenue shocks, which countries have low policy control over (Briguglio and others, 2009; Guillaumont, 2009). Higher economic vulnerability can jeopardize a country's fiscal positions, and reduce sustainability of its decent employment and income achievements. There has been plenty of evidence on the negative consequences of economic vulnerability on growth (Hnatkovska and Loayza, 2005), consumption (Loayza, 2007), government expenditure (Arezki and Brückner, 2012), and investment (Aizenman and Marion, 1999).

There has been little consensus on how to measure economic vulnerability, and accordingly assess the degree of income sustainability (Angeon and Bates, 2015).[1] One way to do that is to look at the structure of a country's economy, particularly the extent of its economic diversification. Yet, measuring economic diversification is not straightforward given the absence of a standard definition. In this regard, two broad types of conventional indicators emerge, one focusing on the structure of export bundles (export diversification), and the other on income dependency measured by the share of a given source of income to total GNI.

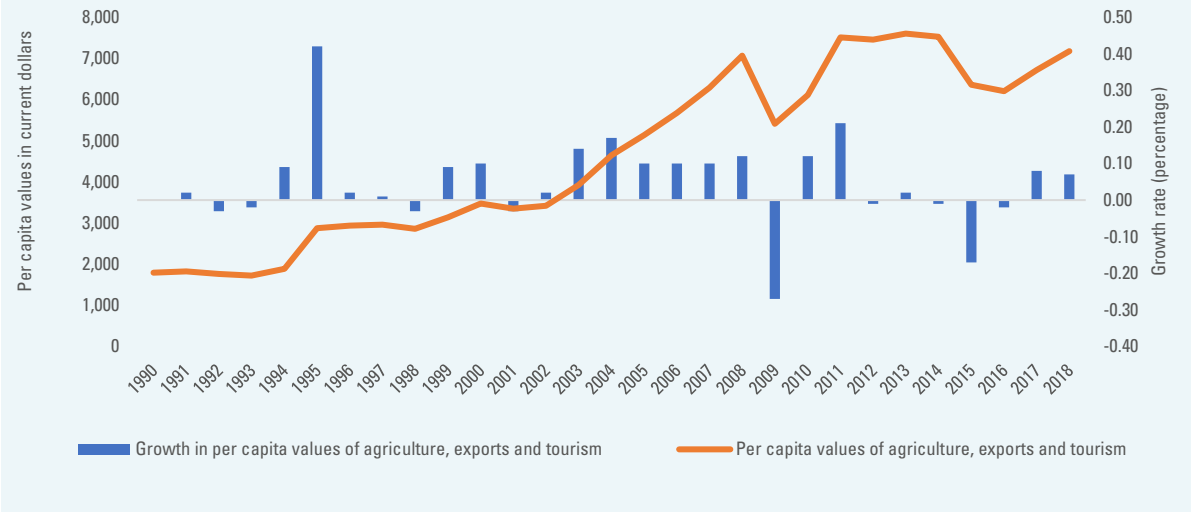
Exports have been widely cited as a major source of output fluctuations leading to destabilization in growth, taxation and redistribution (Easterly and others, 1993; Guillaumont, 2009). Similarly, in many

1 Many composite indices measure economic vulnerability. One common vulnerability index was developed by the United Nations Committee for Development Policy (Guillaumont, 2009; United Nations, 2008). However, this index conflates environmental vulnerability with economic vulnerability, by including indicators of the percentage of population displaced owing to natural disasters.

developed and developing countries, tourism is a major source of employment, government revenue and foreign exchange earnings. Without it, many countries may experience a dramatic contraction in gross domestic product and a rise in unemployment. In some countries, unemployment could rise by more than 20 percentage points, with some sectors at risk of being wiped out if the duration of the tourism standstill reaches a year (UNCTAD, 2019). However, receipts from exports and tourism are important characteristics of open economies, but may turn out to be irrelevant to other closed non-advanced economies, which could experience different types of exogenous shocks. For this reason, if agriculture output constitutes a larger share of a country's income, it may add to vulnerability since it is subject to frequent swings from unfavorable weather shocks.

Notwithstanding the vulnerability measurement challenge, there is consensus on three main sources that affect developing economies in general, and Arab countries in particular. These are: reliance on a few low-value-added commodity exports, such as oil and gas; reliance on a few service exports, mainly tourism receipts; and relatively high dependence on agriculture, fisheries and forestry sectors (hereafter "agriculture income"), which are subject to both environmental supply side and trade-related demand side shocks.[2]

Figure 1. Evolution of global commodity exports, tourism and agriculture receipts, 1990–2018



Source: The exports of goods (current United States dollars) data and export concentration index are taken from UNCTAD (2020). Tourisms receipts (current United States dollars), agriculture income (current United States dollars), GNI (current United States dollars), and GNI per capita (purchasing power parity (PPP), constant 2017 international United States dollars) are obtained from World Development Indicators database (World Bank, 2020).

2 We chose not to take into account remittance flows because they tend to be more resilient over time owing to more diversified migration destinations and labour markets. Moreover, remittances are not always sent through legal channels, making them less traceable and widely understated (World Bank, 2011). Other sources of income, such as foreign direct investment and aid, were excluded because they tend to depend more on the efficiency of a country's internal policy rather than on exogenous shocks.

The data in figure 1 support this conclusion. The global share of exports, tourism receipts and agriculture income to GNI increased from less than 30 per cent in the 1990s to 53 per cent in 2008. With some fluctuations, this share has been on average 47 per cent over the period 2008–2018, reaching 44 per cent by 2018. Even though the trend in these income sources has been generally increasing, the growth rate has been highly volatile, with a standard deviation and a coefficient of variation amounting to 0.12 and 2.46, respectively. In contrast, GNI per capita growth shows lower volatility, with a standard deviation of 0.01 and a coefficient of variation of 0.48. These three income sources occupy a relatively large share of income in many developing and Arab countries.

B. Methodology and data sources

As noted in the introduction, TAVI measures resilience from shocks emanating from three growth sources. Firstly, we use as a proxy for reliance on commodity exports (such as oil and gas) the product of the export concentration index and ratio of exports of goods to GNI. The rationale is to measure the degree of dependency on receipts from a bundle of exported goods. Using the export concentration index would only capture the structure of an exported bundle, but not revenue dependency. For instance, a country's exports bundle could be concentrated in only a few goods, but the export receipts could represent a very small share of its total income. Likewise, to measure economic dependency on tourism and agriculture income, we calculate their corresponding shares to GNI.

To compute TAVI, the three indicators are transformed into indices ranging from 0 to 1, using the conventional minimum-maximum formula for 2010 and 2018. TAVI is equivalent to the weighted sum of the three subindices. To calculate the weights of these subindices, we first obtain the ratio of commodity exports, tourism receipts and agriculture income to GNI, and sum them up. We then calculate the share of each of these ratios to the total sum of the three ratios together, as shown below.

(1) $$Trade\ and\ agriculture\ vulnerability\ index = \sum_{i=1}^{3} w_i\ Dependency\ index_i$$

Where $w_i = \frac{share_i}{\sum_{i=1}^{3} share_i}$

The three dependency indices are:

(2) $$Commodity\ exports\ dependency\ index = Export\ concentration\ index \times \frac{Commodity\ exports}{GNI}$$

(3) $$Tourism\ dependency\ index = \frac{Tourism\ receipts}{GNI}$$

(4) $$Agriculture\ dependency\ index = \frac{Agriculture\ value-added}{GNI}$$

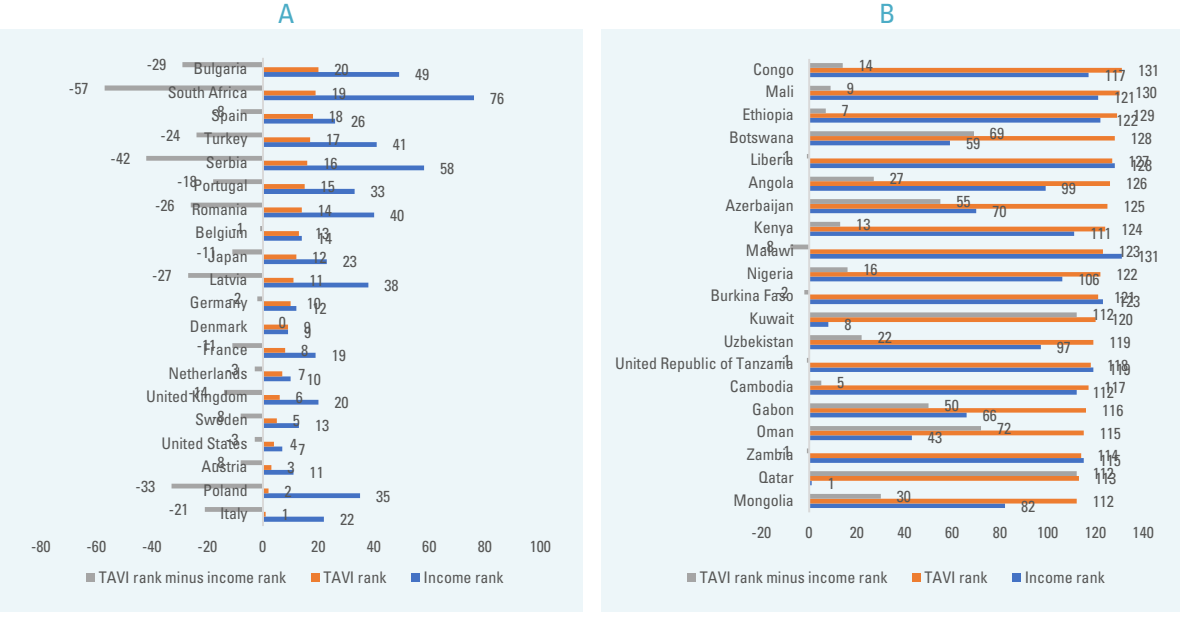
To have smooth fluctuations and deal with outliers, the average value of the last five years has been used for each of these TAVI components, and log transformation has been applied before applying the minimum-maximum formula.

Lastly, since higher values on the subindices reflect higher dependency, the final index was subtracted from 1 so that higher values reflect higher diversification. Therefore, TAVI values close to 1 correspond to highly diversified economies, while values close to 0 correspond to highly dependent economies.

2. Results

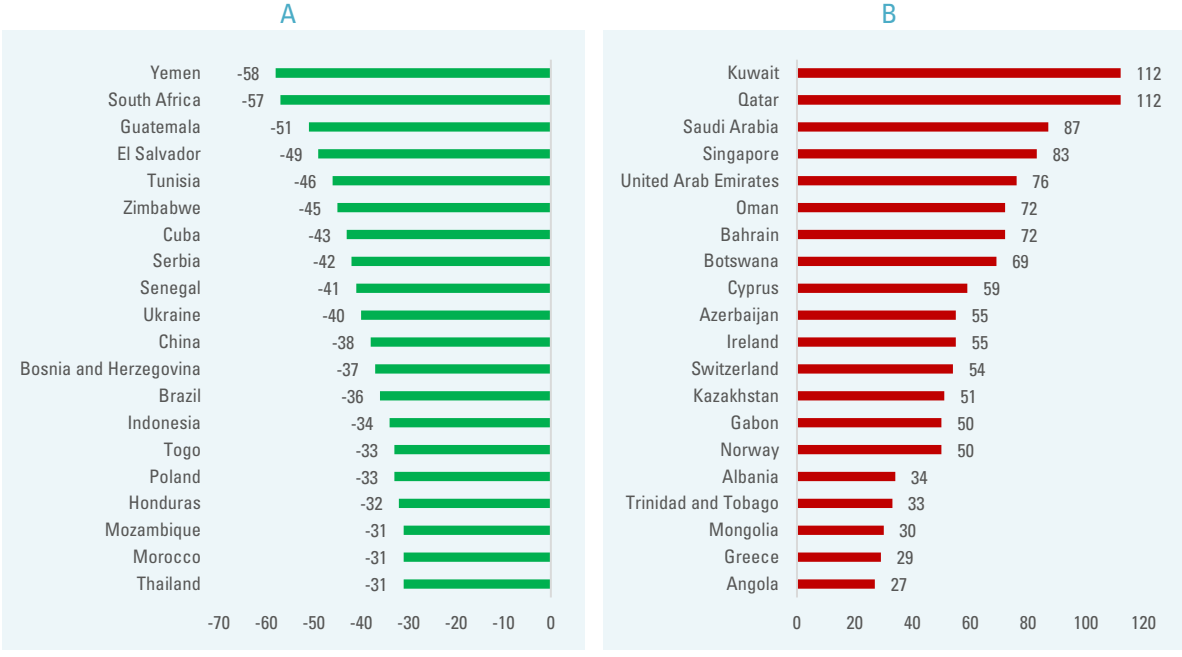
There are no major surprises in the results in figure 2. The most resilient economies (figure 2A) are mainly in advanced industrialized countries and other rapidly industrializing emerging economies, such as Poland and Romania. The least resilient economies (figure 2B) are mainly in sub-Saharan Africa, but three Arab countries (Kuwait, Oman and Qatar) are also included in that list. The difference between the country TAVI and GNI per capita ranks are also shown in figure 2. They reveal an interesting but expected stylized fact. The vast majority of the most resilient economies rank better on TAVI than on GNI, but with the highest difference recorded by South Africa, Serbia and Poland. These countries are more diversified than their GNI levels would indicate, suggesting more room for future growth. Conversely, the vast majority of the least diversified economies rank better on GNI than TAVI, with the highest rank differences recorded for five natural-resource-rich countries, namely Qatar, Kuwait, Oman, Botswana and Azerbaijan. These resource rich and/or predominantly agrarian economies face significant growth sustainability and volatility challenges. The sharp difference in performance of both groups of countries is also demonstrated in figure 3, which shows the 20 largest gains and losses in rank differences between GNI and TAVI. The five highest rank gains were recorded by Yemen (which has one of the lowest GNI per capita scores), South Africa, Guatemala, El Salvador and Tunisia, whereas the five highest rank losses were recorded by Kuwait, Qatar, Saudi Arabia, Singapore and the United Arab Emirates.

Figure 2. Highest (A) and lowest (B) TAVI ranks (of 131 countries) and their rank difference with GNI, 2018



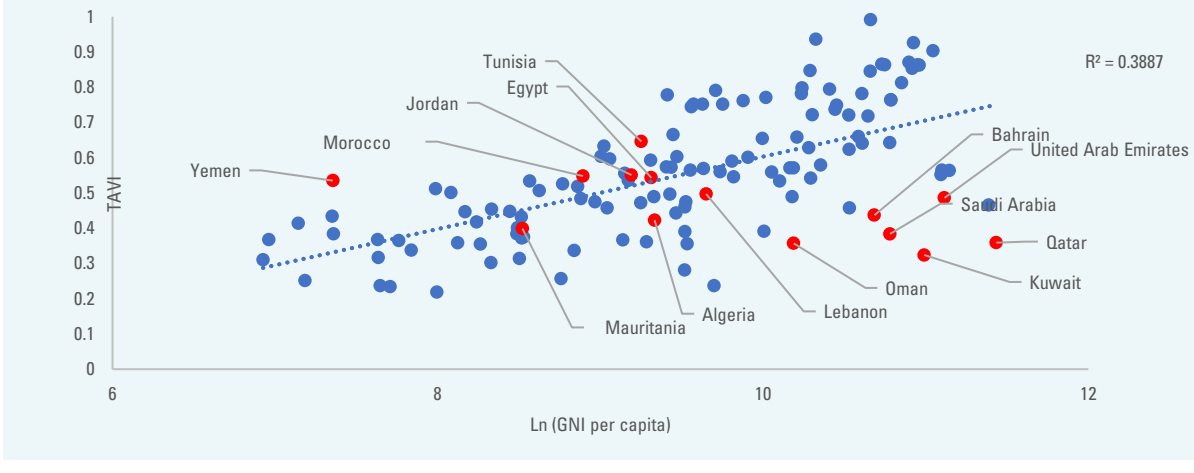
Source: ESCWA calculations.

Figure 3. TAVI minus GNI rankings: highest 20 country gains (A) and losses (B) (of 131 countries)



Source: ESCWA calculations.

Figure 4. GNI per capita (log) and TAVI



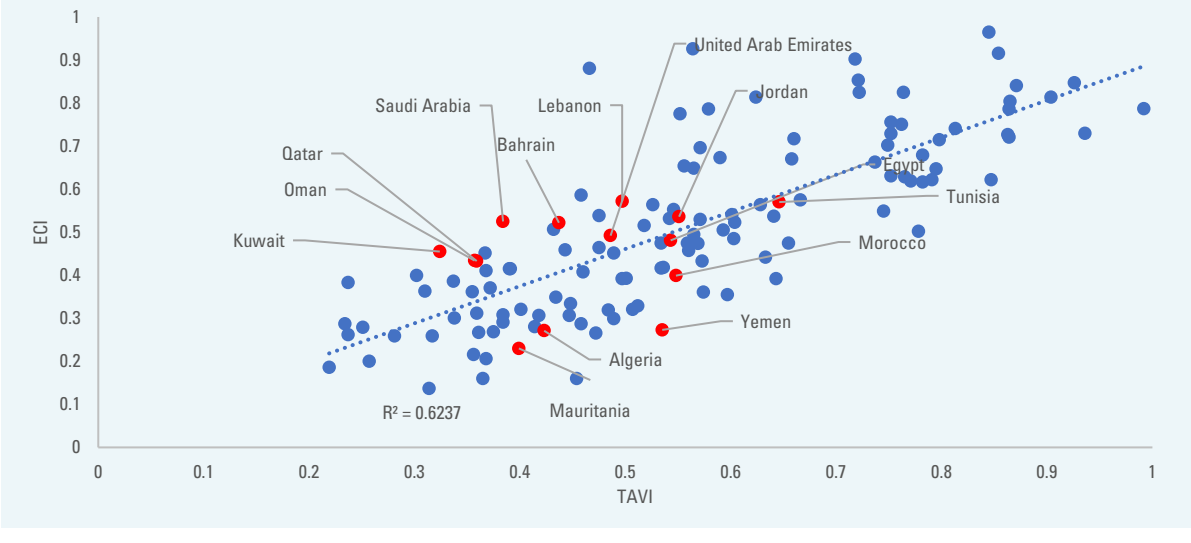
Source: ESCWA calculations.

While unsurprising, the concentration of Arab oil-rich Gulf Cooperation Council (GCC) countries in figure 3 is a matter of concern. It suggests these economies still have much to achieve on the economic diversification front. This is also evident in figure 4, which plots TAVI with GNI, highlighting the position of oil-rich Arab countries as distinct outliers. Two countries, Tunisia and Yemen, lie distinctly above the regression line, a position that indicates higher resilience relative to their income level. In the case of Tunisia, this is not unexpected given the country's comparatively higher level of

economic diversification, and the relative sophistication of its export base. In the case of Yemen, however, it is not straightforward. Its position as an outlier suggests that the Yemeni economy is less vulnerable to shocks from agriculture, tourism and oil exports. This is correct, but the pathway for such independence is not one we would recommend, given that it is the result of a longstanding conflict that has dramatically reduced the country's commodity export and tourism receipts, and its agriculture production relative to its potential or even its low level of income per capita. The conclusion to draw is that it is entirely plausible that vulnerability is reduced by episodes of conflict, which are often associated with severe economic contraction and delinking from the global economy (as in also the case in the trade-sanctioned Syrian Arab Republic).

Figure 5 plots TAVI against the economic complexity index (ECI), a measure of the amount and the sophistication of knowledge used to produce a given product.[3] A key observation that emerges from figure 5 is that GCC economies perform better on ECI relative to their TAVI. This indicates that despite structural weaknesses in the form of high oil and gas export concentration, there has been a significant push for diversification into knowledge-based sectors in GCC economies over the past two decades. The different narratives that emerge from TAVI and ECI support the inclusion of both aspects when measuring economic diversification and resilience, which will be done in a forthcoming ESCWA publication on economic resilience.

Figure 5. TAVI and ECI



Source: ESCWA calculations.

3 For additional information on ECI, see Growth Lab (2019).

3. Conclusion

The present paper proposes an index to measure growth sustainability, proxied by economic vulnerability to shocks from three major income sources. Given our definition, sustainable growth is characterized by insulation from shocks resulting from reliance on few commodity exports and services, or from dependence on the domestic agriculture sector that is subject to environmental shocks. By combining risks from export concentration and over dependence on agriculture or services sectors, TAVI provides a useful indicator that is accessible to policymakers.

As is the case with any index, there are several limitations to the proposed measure. One major limitation is that there are some peculiarities in the case of conflict-affected countries. For example, in Yemen, conflict has led to a very low reliance on commodity and service trade after the collapse of the oil and gas and tourism sectors. Agriculture should have picked up; however, given conflict conditions and severe water shortages, this did not happen. Therefore, TAVI will reward closed economy outliers. A broader definition of economic resilience, one that includes exposure to risks from the financial sector (which are a major source of economic instability globally and in the Arab region) and from a lack of integration in the knowledge economy, will partially address this limitation. However, it remains true that closed economies are inherently less vulnerable to shocks from globalization, especially if they are also net food exporters (as in the case of the Syrian Arab Republic prior to the conflict).

The results of the index for remaining Arab countries are not surprising. There are significant structural weaknesses in endogenous growth capabilities and vulnerabilities to external shocks in oil-rich Arab economies. Accordingly, some Arab countries incur significant score and rank losses on TAVI relative to GNI, the highest worldwide in fact. However, a second group of countries show rank improvements. One country, Tunisia, is among the global top five winners. Therefore, it would be false to conclude that Arab countries are a homogenous economic group in terms of their exposure to trade and agriculture concentration risks. One positive finding is that, despite their large rank losses on TAVI, GCC countries score relatively better on the economic complexity index. This indicates that knowledge utilization is increasing and beginning to yield positive resilience gains.

Annex

Country	GNI per capita	TAVI	ECI	Income rank	TAVI rank	TAVI rank minus income rank
Albania	13637	0.390	0.415	68	102	34
Algeria	11302	0.423	0.271	78	96	18
Angola	6361	0.257	0.200	99	126	27
Argentina	21918	0.655	0.475	51	36	-15
Armenia	12895	0.443	0.459	72	92	20
Australia	48024	0.643	0.392	18	38	20
Austria	55533	0.926	0.847	11	3	-8
Azerbaijan	13598	0.281	0.259	70	125	55
Bahrain	43671	0.437	0.522	21	93	72
Bangladesh	4643	0.448	0.334	109	90	-19
Belarus	18187	0.590	0.673	55	48	-7
Belgium	51619	0.813	0.741	14	13	-1
Bolivia (Plurinational State of)	8445	0.458	0.287	90	88	-2
Bosnia and Herzegovina	14378	0.752	0.631	63	26	-37
Botswana	16311	0.237	0.383	59	128	69
Brazil	14182	0.745	0.549	64	28	-36
Bulgaria	22406	0.771	0.619	49	20	-29
Burkina Faso	2069	0.317	0.259	123	121	-2
Cote d'Ivoire	4866	0.401	0.321	107	99	-8
Cambodia	3876	0.355	0.362	112	117	5
Cameroon	3526	0.447	0.307	114	91	-23
Canada	48292	0.765	0.629	16	21	5
Chile	23222	0.559	0.475	48	59	11

Country	GNI per capita	TAVI	ECI	Income rank	TAVI rank	TAVI rank minus income rank
China	15187	0.752	0.756	62	24	-38
Colombia	14085	0.565	0.495	65	56	-9
Congo	2964	0.219	0.186	117	131	14
Costa Rica	18371	0.546	0.553	54	64	10
Croatia	27151	0.658	0.670	42	35	-7
Cuba	8578	0.597	0.355	89	46	-43
Cyprus	37459	0.458	0.586	28	87	59
Czechia	37294	0.721	0.853	30	31	1
Democratic Republic of the Congo	1056	0.368	0.206	130	109	-21
Denmark	57553	0.863	0.727	9	9	0
Dominican Republic	16927	0.560	0.458	57	58	1
Ecuador	11256	0.489	0.299	79	79	0
Egypt	11079	0.543	0.481	80	65	-15
El Salvador	8141	0.604	0.523	92	43	-49
Estonia	34643	0.749	0.702	31	27	-4
Eswatini	7844	0.475	0.539	93	83	-10
Ethiopia	2094	0.237	0.262	122	129	7
Finland	48360	0.764	0.825	15	22	7
France	46537	0.864	0.786	19	8	-11
Gabon	13811	0.356	0.216	66	116	50
Georgia	13701	0.475	0.464	67	82	15
Germany	55155	0.854	0.916	12	10	-2
Ghana	5057	0.375	0.269	102	106	4
Greece	29555	0.542	0.532	37	66	29
Guatemala	8274	0.633	0.442	91	40	-51
Guinea	2347	0.365	0.160	120	111	-9
Honduras	5241	0.534	0.417	101	69	-32
Hungary	29840	0.722	0.825	36	30	-6
India	6427	0.526	0.564	98	71	-27

Country	GNI per capita	TAVI	ECI	Income rank	TAVI rank	TAVI rank minus income rank
Indonesia	11042	0.593	0.505	81	47	-34
Iran (Islamic Republic of)	13617	0.460	0.408	69	86	17
Ireland	65762	0.552	0.775	6	61	55
Israel	39568	0.660	0.717	27	34	7
Italy	42657	0.992	0.787	22	1	-21
Jamaica	9297	0.367	0.452	88	110	22
Japan	42564	0.845	0.965	23	12	-11
Jordan	9807	0.551	0.536	85	62	-23
Kazakhstan	22172	0.391	0.415	50	101	51
Kenya	4135	0.302	0.400	111	124	13
Republic of Korea	42002	0.718	0.902	24	32	8
Kuwait	59333	0.324	0.455	8	120	112
Kyrgyzstan	4980	0.432	0.507	105	95	-10
Lao People's Democratic Republic	7192	0.484	0.319	95	81	-14
Latvia	29410	0.847	0.622	38	11	-27
Lebanon	15519	0.497	0.572	60	77	17
Liberia	1319	0.251	0.279	128	127	-1
Lithuania	34264	0.737	0.663	32	29	-3
Madagascar	1569	0.384	0.308	125	103	-22
Malawi	1018	0.310	0.363	131	123	-8
Malaysia	26557	0.571	0.696	44	52	8
Mali	2224	0.234	0.287	121	130	9
Mauritania	5015	0.399	0.230	103	100	-3
Mauritius	24408	0.534	0.475	47	70	23
Mexico	19476	0.762	0.751	53	23	-30
Mongolia	10763	0.361	0.267	82	112	30
Morocco	7281	0.548	0.399	94	63	-31
Mozambique	1265	0.414	0.281	129	98	-31

Country	GNI per capita	TAVI	ECI	Income rank	TAVI rank	TAVI rank minus income rank
Myanmar	4852	0.384	0.291	108	105	-3
Namibia	9618	0.536	0.418	86	67	-19
Netherlands	57014	0.864	0.721	10	7	-3
New Zealand	40559	0.641	0.537	25	39	14
Nicaragua	5565	0.507	0.321	100	74	-26
Nigeria	4929	0.314	0.137	106	122	16
North Macedonia	15279	0.569	0.474	61	54	-7
Norway	66180	0.565	0.649	5	55	50
Oman	26593	0.357	0.434	43	115	72
Pakistan	4992	0.372	0.371	104	107	3
Panama	29173	0.628	0.564	39	41	2
Papua New Guinea	4152	0.454	0.160	110	89	-21
Paraguay	12420	0.497	0.392	75	76	1
Peru	12155	0.574	0.361	77	50	-27
Philippines	9414	0.556	0.654	87	60	-27
Poland	30460	0.936	0.730	35	2	-33
Portugal	33176	0.795	0.647	33	15	-18
Qatar	92418	0.359	0.433	1	113	112
Republic of Moldova	12971	0.603	0.485	71	44	-27
Romania	28021	0.798	0.715	40	14	-26
Russian Federation	25962	0.571	0.530	46	53	7
Saudi Arabia	48094	0.384	0.525	17	104	87
Senegal	3230	0.501	0.393	116	75	-41
Serbia	16472	0.791	0.622	58	16	-42
Singapore	88155	0.466	0.881	2	85	83
Slovakia	31403	0.579	0.786	34	49	15
Slovenia	37423	0.624	0.814	29	42	13
South Africa	12232	0.778	0.502	76	19	-57
Spain	40419	0.782	0.679	26	18	-8

Country	GNI per capita	TAVI	ECI	Income rank	TAVI rank	TAVI rank minus income rank
Sri Lanka	12516	0.573	0.433	74	51	-23
Sweden	54020	0.871	0.841	13	5	-8
Switzerland	69243	0.564	0.926	3	57	54
Tajikistan	3784	0.418	0.307	113	97	-16
Thailand	17202	0.752	0.729	56	25	-31
Togo	1558	0.434	0.349	127	94	-33
Trinidad and Tobago	26328	0.489	0.452	45	78	33
Tunisia	10422	0.646	0.570	83	37	-46
Turkey	27864	0.782	0.617	41	17	-24
Uganda	2062	0.368	0.411	124	108	-16
Ukraine	12657	0.666	0.575	73	33	-40
United Arab Emirates	67195	0.486	0.492	4	80	76
United Kingdom of Great Britain and Northern Ireland	45686	0.865	0.804	20	6	-14
United Republic of Tanzania	2531	0.338	0.301	119	118	-1
United States of America	62667	0.904	0.814	7	4	-3
Uruguay	20091	0.601	0.541	52	45	-7
Uzbekistan	6894	0.337	0.386	97	119	22
Venezuela (Bolivarian Republic of)	10380	0.472	0.266	84	84	0
Viet Nam	7051	0.518	0.516	96	72	-24
Yemen	1564	0.535	0.273	126	68	-58
Zambia	3366	0.359	0.312	115	114	-1
Zimbabwe	2942	0.512	0.329	118	73	-45

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The present paper proposes a trade and agriculture vulnerability index (TAVI). By measuring risks from export concentration and over-dependence on agriculture or services sectors, TAVI provides a useful indicator that is accessible to policymakers. The results of the index show significant overall structural weaknesses for Arab countries in endogenous growth capabilities and vulnerabilities to external shocks. However, Arab countries are not a homogenous economic group in terms of their exposure to trade and agriculture concentration risks. Oil-rich economies incur significant score and rank losses on TAVI relative to GNI, the highest worldwide in fact. However, a second group of countries show rank improvements, and Tunisia is among the global top five winners.

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