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Covid-19 Economic Vulnerability and Resilience Indexes: Global Evidence

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Covid-19 Economic Vulnerability and Resilience Indexes: Global Evidence**Samba Diop, Simplicé A. Asongu & Joseph Nnanna**

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Abstract

The study complements the extant literature by constructing Covid-19 economic vulnerability and resilience indexes using a global sample of 150 countries which are categorized into four principal regions, namely: Africa, Asia-Pacific and the Middle East, America and Europe. Seven variables are used for the vulnerability index and nine for the resilience index. Both regions and sampled countries are classified in terms of the two proposed and computed indexes. The classification of countries is also provided in terms of four scenarios pertaining to vulnerability and resilience characteristics, notably: low vulnerability-low resilience, high vulnerability-low resilience, high vulnerability-high resilience and low vulnerability-high resilience to respectively illustrate, sensitive, severe, asymptomatic and best cases. The findings are relevant to policy makers especially as it pertains to decision making in resources allocation in the fight against the global pandemic.

JEL Codes: E10, E12, E20, E23, I10, I18

Key Words: Novel coronavirus, Economic vulnerability, Economic resilience

1. Introduction

Two main factors motivate the focus of this paper on the development of Covid-19 economic vulnerability and resilience indexes, notably: (i) disparities of countries in terms of vulnerabilities and resilience to the Covid-19 crisis and (ii) gaps in the extant Covid-19 literature. The two main factors are critically engaged in what follows.

First, consistent with the attendant literature (Asongu, Diop & Nnanna, 2020), there are various geographical (i.e. country and regional) disparities on the effectiveness and consequences of Covid-19 measures. This reveals varying levels of economic resilience and vulnerability to the underlying pandemic. To put this emphasis in more perspective, the findings of the study are based on thirty-four Covid-19 mitigating and preventing measures classified into five principal categories (i.e. public health, social distancing, economic and governance, movement restrictions and lockdown measures), in 186 countries consisting of four main regions (i.e. America, Asia-Pacific and the Middle East, Europe and Africa). The results show that, *inter alia*: (i) the underlying measures designed to fight the Covid-19 pandemic have had a favourable impact on European economies; (ii) at the global level, measures of lockdown have not engendered significant effects in decreasing the pandemic; (iii) movement restrictions have been instrumental in the fight in the American continent; (iv) measures of social distancing have been favourable in mitigating the crisis in Europe while in Africa, similar measures have not been effective but have instead been counterproductive; (v) economic and governance related policies have for the most part, been beneficial to European countries and (vi) the expected effect from public health measures have not been apparent, probably owing to the fact that the attendant measures may fundamentally be awareness policies that are largely designated to the fraction of the population which is already infected. The present study improves the understanding on why some countries and regions have responded relatively better than others by providing Covid-19 economic vulnerability and resilience indexes. The focus of the study is worthwhile because to the best of our knowledge, the extant literature is sparse on such indexes pertaining to the Covid-19 pandemic.

Second, while the extant literature on the Covid-19 pandemic has focused on a plethora of nexuses between the Covid-19 pandemic and macroeconomic outcomes, we know very little about existing measures of economic resilience and economic vulnerability to the crisis. Some studies have focused on the nexus between the scale of government measures and the corresponding economic consequences (Agbe, 2020; Ozili, 2020; Farayabi & Asongu, 2020; Bisong, Ahairwe & Njoroge, 2020; Price & van Holm, 2020). To put these in proper perspective, the literature has been concerned with the socio-economic impacts of the crisis

(Nicola et al., 2020); insights from scholarly and policy circles on the ramification of the corresponding crisis (Ataguba, 2020); policy measures, socio-economic effects and opportunities linked to the new coronavirus (Ozili, 2020); how the remittances flows have been affected by the pandemic (Bisong et al., 2020); the impact of the pandemic on poverty experiences in childhood in the Middle East and North Africa (Agbe, 2020); linkages between inequality, social stratification and the Covid-19 pandemic (Obeng-Odoom, 2020); nexus between the Covid-19 crisis and the environment (Amankwah-Amoah, 2020) and assessing laboratory responses to the coronavirus (Odeyemi et al., 2020).

The present study contributes to the extant literature by proposing the indexes of economic vulnerability and economic resilience. The rest of the study is structured as follows. Section 2 discusses the construction of the indexes while the results and corresponding discussion are covered in Section 3. Section 4 concludes with implications and future research directions.

2. Construction of the indexes

The methodological framework for the construction of composite indicators imposes an iterative process with different steps. In this section, we respect this process by starting with the theoretical framework and data selection. Secondly, we present the normalization of the data. Finally, the weighting and aggregation of the data is conducted.

2.1. Theoretical framework and data selection

The theoretical framework is the starting point in the construction of the composite indicator. The objective of the step is to clearly define the phenomenon to be measured and the corresponding different indicators. For our index, the data selection is guided by the theoretical framework based on the direct and indirect economic impacts of the Covid-19 pandemic. The data description and their justifications are provided in Table 1. Seven variables are used for the vulnerability index and nine for the resilience index.

2.2. Normalization

Since we have different measurement units in our dataset, the normalization is required prior to data aggregation. There are numerous normalization methods. For our index, we apply the well-known min-max method (Diop & Asongu, 2020a). The transformation is:

$$I_{qc} = \frac{x_{qc} - \min_c(x_q)}{\max_c(x_q) - \min_c(x_q)}$$

where x_{qc} the value of indicator q for country c . The minimum and the maximum values for each indicator are calculated across countries. For indicators such as external debt, consumer price index, unemployment and fiscal deficit where higher values imply lower resilience, we use the following transformation:

$$I_{qc} = 1 - \frac{x_{qc} - \min_c(x_q)}{\max_c(x_q) - \min_c(x_q)}$$

2.3. Weighting and aggregation

The aggregation and corresponding weighting are of notable relevance in the computation of the overall index and hence, the rankings of countries most exposed to the Covid-19 pandemic. While a plethora of methods have been employed in weighting, in the present study, a technique for the analysis of multivariate data is used. The fundamental principal component analysis (PCA) is employed. The choice is motivated by the perspective that with the PCA, the variables can be summarized without loss in substantial data variability in the main data. Moreover, it is worthwhile to note that the purpose of the PCA is to elucidate the variability of data that is observed via some linear combinations pertaining to the original data. Loadings obtained from the PCA are used to compute the different weights instead of giving the same weight to all variables. The first step consists of applying the PCA on the variables for each dimension in view of deriving different weights. With the weights derived, the PCA is then again employed on the weighted sub-indices in order to compile economic resilience and economic vulnerability indexes.

3. Results and discussion

The first step is the application of PCA to the selection of the number of components. We apply the general rule (Kaiser Criterion) from which, all factors with eigenvalues below 1 are dropped (Tchamyou, 2017, 2020; Diop & Asongu, 2020b). As apparent in Table 2, the first-three factors elucidate most of the variance. Hence, it is worthwhile to establish that the first-three principal components elicit the variability of the vulnerability and the resilience dimensions. With the results obtained, we can now deal with the development of the different weights (see Table 2).

3.1. Analysis of the economic vulnerability and resilience indexes

The results of the economic vulnerability index and economic resilience index by regions are provided in Table 3. These show that the Asia-Pacific and Middle East region are the most vulnerable economically region to the Covid-19 pandemic with a value of 0.29. It is followed by Africa (0.26). Europe earns the lowest score corresponding to the best region regarding the vulnerability index. When we consider the results at the worldwide level, as apparent in Table 4, highest scores are traceable to the Congo Republic (0.56), Liberia (0.48), Kuwait (0.42), Iraq (0.40) and the Central African Republic (0.40). Hungary (0.09), the Netherlands (0.11), China (0.12) and Argentina (0.13) are the top performing countries because they present lowest scores on economic vulnerability to the Covid-19 pandemic.

Regarding the economic resilience, Europe is at the top with a score of 0.57. It is followed by the Asia-Pacific and Middle East (0.47) and Americas (0.47) regions. Africa ranks last with a score value of 0.39. On the one hand, as apparent in Table 4, New Zealand (0.71), Switzerland (0.70), Norway (0.70), Canada (0.69), Denmark (0.69), China (0.69), Luxembourg (0.69), Sweden (0.69), Australia (0.68) are the top performing countries for the economic resilience index. On the other hand, Equatorial Guinea (0.29), Haiti (0.30), Iraq (0.30), Zimbabwe (0.31), Afghanistan (0.31), Congo Republic (0.30), Republic Democratic of Congo (0.30), Angola (0.31), Djibouti (0.31) and Lesotho (0.33) have the lowest score and so are the least resilient countries to the Covid-19 pandemic in the world.

3.2. Cross analysis between economic vulnerability and economic resilience

For the cross analysis between economic vulnerability and economic resilience indexes, we follow the approach of Briguglio (2003) and Briguglio et al. (2008). We make a classification of the countries in four scenarios corresponding to quadrants. The position of each country depends on their vulnerability and resilience characteristics. Then, we combine the two indexes to indicate the level exposition of all countries to the Covid-19 pandemic. The scenarios are: low vulnerability-low resilience, high vulnerability-low resilience, high vulnerability-high resilience and low vulnerability-high resilience. To adapt these quadrants within the context of the Covid-19 pandemic, we use “sensitive cases” “severe case”, “asymptomatic cases” and “best cases” respectively, to characterize these different scenarios. The results of the cross analysis between the two indexes are shown in Figure 1. We use the averages of the indexes for all countries (dashed lines in the figure) to separate the different quadrants. Overall, these tendencies derived from the Figure 1 are:

- Approximately 90% of African countries are either in the low vulnerability-low resilience quadrant (the “sensitive cases”) or in the high vulnerability-low resilience quadrant (the “severe cases”) and include a few European countries (Turkey, Russia Federation, Ukraine, Belarus, North Macedonia, Moldova, Bosnia and Herzegovina) and Asia-Pacific and Middle East countries. We also recognize some Latin America countries such as Brazil, Ecuador, Mexico, Bolivia.
- Only 13 out of 150 countries are apparent in the high vulnerability-high resilience (the “asymptomatic cases”). We note two African countries (Seychelles and Rwanda), six European countries (Cyprus, Georgia, Albania, Montenegro and Grenada), three Asia-Pacific and Middle East countries (Fiji, Oman and Qatar) two American countries (Jamaica and Dominica) and one Asian country (Hong Kong).
- More than half of European countries fall in the low vulnerability-high resilience corresponding to the “best cases”. For African countries, only Mauritius and Botswana are in this scenario. Senegal is in borderline with high vulnerability-high resilience quadrant. The United States and Canada are the most well positioned American countries in this quadrant.

4. Concluding implications and future research directions

The study complements the extant literature by constructing Covid-19 economic vulnerability and resilience indexes using a global sample of 150 countries which are categorized into four principal regions, namely: Africa, Asia-Pacific and the Middle East, America and Europe. Seven variables are used for the vulnerability index and nine for the resilience index. Both regions and sampled countries are classified in terms of the two proposed and computed indexes. The classification of countries is also provided in terms of four scenarios pertaining to vulnerability and resilience characteristics, notably: low vulnerability-low resilience, high vulnerability-low resilience, high vulnerability-high resilience and low vulnerability-high resilience.

The established findings have obvious scholarly and policy implications. On the scholarly front, the scientific community has been provided with indexes via which to understand how countries have been affected by and/or resisted to the Covid-19 pandemic. On the policy front, policy makers can leverage on the attendant indexes for decision making, especially as it pertains to the allocation of resources in the fight against the pandemic.

Future research can improve this study by using the established indexes within the framework of understanding how they are related with other macroeconomic indicators;

Moreover, it is worthwhile for future studies to provide insights into why some countries are lagging behind in terms of resilience and why others are leading in terms of vulnerability. Based on these future assessments, more could be known on why some countries have failed and/or succeeded in the fight against the Covid-19 pandemic and by extension, what lessons can be drawn respectively, from the attendant failures and successes of corresponding countries.

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Table1: Variables selection

Variables	Sources	Year	Justifications
Economic vulnerability			
Foreign Direct Investment, net inflows (% of GDP)	WDI	2018	The impacts of the pandemic on FDI flows to these economies may be particularly severe (especially in developing countries where the primary and manufacturing sectors depend a lot on FDI).
Personal remittances, received (% of GDP)	WDI	2019	Covid-19 has considerably affected remittances in the world (especially for developing countries). This impact leads to a significant effect on poverty reduction, consumption expenditure and therefore on the demand.
Net ODA received (% of GNI)	WDI	2018	The more a country relies on ODA, the more it is exposed to an economic vulnerability. Most of the donor providers are facing an unprecedented economic crisis.
Oil rents (% of GDP)	WDI	2017	The sharp decline in oil prices is set to compound the impact of Covid-19, by exacerbating challenges in some of the region's largest resource-intensive economies. For example, the economic growth in oil exporters is projected to decline from 1.8 percent in 2019 to -2.8 percent in 2020 corresponding to a downward revision of 5.3 percent points from the October 2019 Regional Economic Outlook for Sub-Saharan Africa. This impact could be explained by the reduction of the global demand in oil especially in the transport sector.
Total natural resources rents (% of GDP)	WDI	2017	Economic growth in natural resource-intensive countries is expected to decline drastically. In effect, global natural resources market demand (oil, gas, coal, etc.) is declining as the Covid-19 spreads around the world.
International tourism, receipts (% of total exports)	WDI	2018	Countries depending on tourism are expected to witness a severe economic contraction because of extensive travel restrictions (especially in air travel) and lockdowns. The latest rapport of the United Nations World Tourism Organisation (UNWTO) World Tourism Barometer shows that the near-complete lockdown imposed in response to the Covid-19 pandemic led to a 98% fall in international tourist number in May 2020 comparatively to 2019. The rapport shows also a 56% year-on-year drop in tourist arrivals between January and may 2020 inducing a fall of 300 million tourists and US\$320 billion lost in international tourism receipts- more than three times the loss during the Global Economic

			Crisis of 2009.
Imports of goods and services (% of GDP)	WDI	2018	The more the country depends on the importation of goods and services, the more it would be exposed to the Covid-19 shock with regard to the availability and costs of the imports. Indeed, food security represents a source of vulnerability in countries that strongly rely on food imports.
Economic resilience			
Agriculture, forestry, and fishing, value added (% of GDP)	WGI	2018	A country with a higher value added (% of GDP) would be more resilient to the Covid-19 economic impact. A large dependence on agriculture would protect the countries to a food import dependency. Agriculture can play a key role in supporting countries in response to the pandemic by reducing import food, oil rents dependency.
Government Effectiveness	WGI	2018	This variable reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Government effectiveness ensures a successful response to Covid-19 and strengthens the economy's resilience to the pandemic
Regulatory Quality	WGI	2018	This variable reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. During the Covid-19 pandemic, governments make numerous decisions with the aim of boosting economic activity. Thus, a good regulatory quality is essential for the implementation of these policies.
Control of corruption	WGI	2018	This indicator reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Governments around the world are implementing rapid responses to the Covid-19 pandemic. According to the World Bank (2020), corruption risks, present in government responses to all these challenges and heightened by the scale and speed of the emergency, undermine the effectiveness of responses.
External debt stocks (% of GNI)	WDI	2018	It is highly probable to assist to an implosion of the external debt to the increase in fiscal deficits. So a country with a high level of external debt may find it more difficult to mobilize resources in order to offset the effects of external shocks. Thus, a low level of external debt could be a good indicator of resilience to the Covid-19 pandemic.

Consumer price index (2010 = 100)	WDI	2018	The Covid-19 pandemic causes a large shock to both demand and supply via the implementation of social distancing, lockdowns and travel restrictions. A decrease of the supply could bring back inflation while the decrease of demand reduces the consumption and therefore deflation. The pandemic settles a situation of uncertainty. A low and stable level of inflation would be a definite asset for resilience in a country.
Unemployment, total (% of total labour force) (modelled ILO estimate)	WDI	2019	Employment could be associated with the resilience of a shock-absorbing nature. A low level of unemployment can withstand the impact of the pandemic without excessive welfare costs. In addition, the Covid-19 employment effects would be severe especially in the secondary sector.
Fiscal deficit (% of GDP)	WEO	2018	The government budget could be an important tool in during the Covid-19 pandemic. A healthy fiscal position would allow adjustments to taxation and expenditure policies during the Covid-19 pandemic. During this period, the budget deficit is expected to increase because of the loss of fiscal revenues and the increase of the government expenditures especially on health and social assistances.
Human Development Index	UNDP	2018	In the context of the Covi-19 pandemic, the Human Development Index (HDI) can be considered as a indicator of social development which is an essential component of economic resilience. In effect, a higher level of social development in a country could promote social inclusion, reducing of inequalities (i.e. by mitigating inequality both from the pandemic and its aftermath)

Source: authors

Table2: Number of principal components and weighting

Vulnerability Index								Resilience Index								
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9
Eig. val.	2.05	1.40	1.04	0.93	0.77	0.58	0.22	3.58	1.93	1.11	0.90	0.78	0.25	0.21	0.15	0.09
Prop.	0.29	0.20	0.15	0.13	0.11	0.08	0.03	0.40	0.21	0.12	0.10	0.09	0.03	0.02	0.02	0.01
Cum	0.29	0.49	0.64	0.77	0.88	0.96	1.00	0.40	0.61	0.73	0.83	0.92	0.95	0.97	0.99	1.00
Squared loadings																
Variables	Fdi	Remi	Oda	Oil	Nat	Tour	Imp	Agri	Gov	Reg	Corr	Debt	Cpi	Unem	Def	Hdi
F1	0.07	0.15	0.01	0.23	0.18	0.20	0.14	0.16	0.22	0.18	0.13	0.03	0.03	0.04	0.01	0.18
F2	0.29	0.00	0.19	0.01	0.34	0.01	0.16	0.00	0.00	0.02	0.04	0.00	0.40	0.09	0.43	0.00
F3	0.27	0.18	0.50	0.01	0.00	0.02	0.02	0.18	0.04	0.14	0.26	0.14	0.00	0.13	0.00	0.08
Weights																
Weights	0.19	0.11	0.18	0.11	0.19	0.10	0.12	0.12	0.13	0.12	0.13	0.04	0.13	0.07	0.13	0.11

Sources: Authors. Fdi: Foreign direct investments, Remi: Remittances, Oda: Official Development Assistance, Oil: oil rents, Nat: natural resource rents, Tour: tourism receipt, Imp: importation of goods and services, Agri: Agriculture, forestry, and fishing, value added, Gov: Government Effectiveness, Reg: Regulatory Quality, Corr: Control of corruption, Debt: External debt stocks, Cpi: Consumer price index, Unem: Unemployment, Def: Fiscal deficit, Hdi: Human Development Index.

Table3: Vulnerability and Resilience indexes by regions

Regions	Observations	Mean	Standard Deviation	Minimum	Maximum
Vulnerability Index					
Europe	40	0.19	0.04	0.09	0.30
Africa	50	0.26	0.08	0.14	0.56
Americas	25	0.20	0.06	0.13	0.36
Asia-Pacific and Middle East	35	0.29	0.08	0.16	0.40
World	150	0.23	0.08	0.09	0.56
Resilience Index					
Europe	40	0.57	0.10	0.39	0.70
Africa	50	0.39	0.06	0.29	0.58
Americas	25	0.47	0.08	0.30	0.69
Asia-Pacific and Middle East	35	0.47	0.09	0.30	0.71
World	150	0.47	0.11	0.29	0.71

Sources: authors' computations

Table 4: Country-specific rankings

Countries	Vulnerability Index	Ranking	Countries	Resilience Index	Ranking
Congo Republic	0.563	1	New Zealand	0.714	1
Liberia	0.478	2	Netherlands	0.699	2
Kuwait	0.422	3	Switzerland	0.699	3
Iraq	0.402	4	Norway	0.697	4
Central Africa Republic	0.401	5	Finland	0.695	5
Mongolia	0.397	6	Hong Kong, China	0.693	6
Mozambique	0.377	7	Canada	0.691	7
Chad	0.362	8	Sweden	0.691	8
Guyana	0.361	9	Denmark	0.690	9
Haiti	0.359	10	Australia	0.680	10
Gambia, The	0.347	11	Luxembourg	0.679	11
Kyrgyz Republic	0.346	12	United States	0.671	12
Oman	0.344	13	Iceland	0.669	13
Equatorial Guinea	0.331	14	United Kingdom	0.663	14
Sierra Leone	0.330	15	Japan	0.654	15
Congo Democratic Republic	0.323	16	Ireland	0.653	16
Sao Tomé and Príncipe	0.321	17	Austria	0.650	17
Hong Kong, China	0.320	18	Germany	0.638	18
Saudi Arabia	0.318	19	Estonia	0.634	19
Lesotho	0.314	20	Belgium	0.625	20
Malawi	0.302	21	France	0.617	21
Dominica	0.297	22	Israel	0.607	22
Grenada	0.297	23	Chile	0.595	23
Guinea-Bissau	0.296	24	Korea Republic	0.595	24
Azerbaijan	0.295	25	Czech Republic	0.590	25
Nepal	0.292	26	Slovenia	0.587	26
Mauritania	0.290	27	Senegal	0.581	27
Cabo Verde	0.289	28	Portugal	0.581	28
Burundi	0.289	29	Cyprus	0.571	29
Maldives	0.285	30	Latvia	0.569	30
Burkina Faso	0.283	31	Poland	0.568	31
Montenegro	0.283	32	Malaysia	0.562	32
Seychelles	0.281	33	Qatar	0.557	33
Comoros	0.280	34	Spain	0.556	34
Qatar	0.279	35	Uruguay	0.546	35
Guinea	0.277	36	Mauritius	0.540	36
Niger	0.274	37	Georgia	0.531	37
Mali	0.273	38	Hungary	0.531	38
Gabon	0.272	39	Italy	0.524	39
Togo	0.271	40	Oman	0.518	40
Afghanistan	0.269	41	Costa Rica	0.517	41
Jamaica	0.267	42	Croatia	0.513	42
Georgia	0.266	43	Rwanda	0.509	43
Rwanda	0.266	44	Seychelles	0.507	44
Jordan	0.263	45	Bulgaria	0.505	45
Ethiopia	0.261	46	Fiji	0.503	46

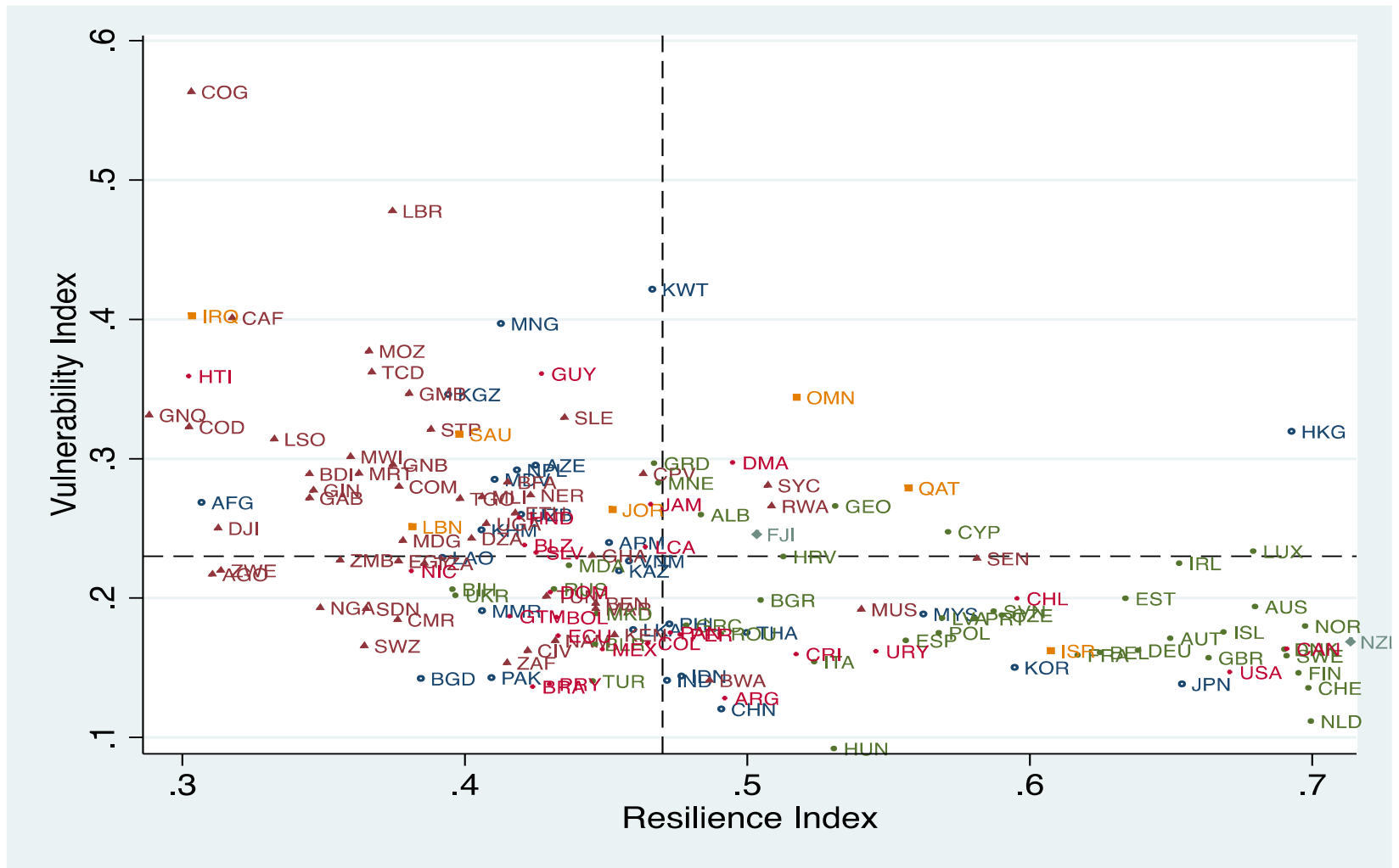
Uzbekistan	0.260	47	Thailand	0.500	47
Albania	0.260	48	Dominica	0.495	48
Honduras	0.258	49	Argentina	0.492	49
Uganda	0.253	50	China	0.491	50
Lebanon	0.251	51	Romania	0.491	51
Djibouti	0.250	52	Botswana	0.487	52
Cambodia	0.249	53	Albania	0.484	53
Cyprus	0.248	54	Greece	0.478	54
Fiji	0.246	55	Indonesia	0.477	55
Algeria	0.243	56	Peru	0.476	56
Madagascar	0.241	57	Panama	0.473	57
Armenia	0.240	58	Philippines	0.472	58
Belize	0.238	59	India	0.472	59
St. Lucia	0.237	60	Montenegro	0.468	60
Luxembourg	0.234	61	Grenada	0.467	61
El Salvador	0.233	62	Kuwait	0.466	62
Ghana	0.231	63	Jamaica	0.466	63
Croatia	0.230	64	Colombia	0.465	64
Lao PDR	0.229	65	St. Lucia	0.464	65
Senegal	0.228	66	Cabo Verde	0.463	66
Zambia	0.227	67	Sri Lanka	0.460	67
Egypt.	0.227	68	Vietnam	0.458	68
Vietnam	0.227	69	Kazakhstan	0.455	69
Tanzania	0.225	70	Kenya	0.453	70
Ireland	0.225	71	Jordan	0.452	71
Moldova	0.224	72	Armenia	0.451	72
Zimbabwe	0.220	73	Mexico	0.449	73
Kazakhstan	0.220	74	Macedonia	0.447	74
Nicaragua	0.219	75	Benin	0.446	75
Angola	0.217	76	Morocco	0.446	76
Russia	0.207	77	Belarus	0.446	77
Bosnia Her	0.206	78	Turkey	0.445	78
Dominican Republic	0.204	79	Ghana	0.445	79
Ukraine	0.202	80	Moldova	0.437	80
Tunisia	0.201	81	Sierra Leone	0.435	81
Estonia	0.200	82	Ecuador	0.433	82
Chile	0.200	83	Bolivia	0.432	83
Bulgaria	0.199	84	Namibia	0.432	84
Benin	0.196	85	Russia	0.432	85
Australia	0.194	86	Dominican Republic	0.430	86
Nigeria	0.193	87	Paraguay	0.430	87
Morocco	0.192	88	Tunisia	0.429	88
Sudan	0.192	89	Guyana	0.427	89
Mauritius	0.192	90	El Salvador	0.425	90
Myanmar	0.191	91	Azerbaijan	0.425	91
Slovenia	0.191	92	Brazil	0.424	92
Macedonia	0.189	93	Niger	0.423	93
Malaysia	0.189	94	Cote d'Ivoire	0.422	94
Czech Republic	0.188	95	Belize	0.421	95
Guatemala	0.187	96	Uzbekistan	0.420	96
Bolivia	0.186	97	Honduras	0.419	97

Latvia	0.186	98	Nepal	0.418	98
Portugal	0.185	99	Ethiopia	0.418	99
Cameroon	0.185	100	Guatemala	0.416	100
Philippines	0.181	101	Burkina Faso	0.415	101
Greece	0.181	102	South Africa	0.415	102
Norway	0.180	103	Mongolia	0.413	103
Sri Lanka	0.177	104	Maldives	0.411	104
Iceland	0.176	105	Pakistan	0.409	105
Thailand	0.175	106	Uganda	0.408	106
Panama	0.175	107	Mali	0.406	107
Poland	0.175	108	Myanmar	0.406	108
Romania	0.175	109	Cambodia	0.406	109
Peru	0.174	110	Algeria	0.402	110
Kenya	0.174	111	Togo	0.398	111
Ecuador	0.173	112	Saudi Arabia	0.398	112
Austria	0.171	113	Ukraine	0.397	113
Spain	0.170	114	Bosnia Her	0.396	114
Namibia	0.169	115	Kyrgyz Re	0.394	115
New Zealand	0.169	116	Lao PDR	0.392	116
Colombia	0.168	117	Sao Tomé and Principe	0.388	117
Belarus	0.167	118	Tanzania	0.386	118
Eswatini	0.166	119	Bangladesh	0.384	119
Canada	0.164	120	Lebanon	0.381	120
Mexico	0.163	121	Nicaragua	0.381	121
Denmark	0.163	122	Gambia. The	0.380	122
Germany	0.163	123	Madagascar	0.378	123
Cote d'Ivoire	0.162	124	Comoros	0.377	124
Israel	0.162	125	Egypt	0.377	125
Uruguay	0.162	126	Cameroon	0.376	126
Belgium	0.161	127	Guinea-Bissau	0.375	127
Costa Rica	0.160	128	Liberia	0.374	128
France	0.159	129	Chad	0.367	129
Sweden	0.159	130	Mozambique	0.366	130
United Kingdom	0.157	131	Sudan	0.365	131
Italy	0.154	132	Eswatini	0.364	132
South Africa	0.154	133	Mauritania	0.363	133
Korea Republic	0.150	134	Malawi	0.360	134
United States	0.147	135	Zambia	0.356	135
Finland	0.146	136	Nigeria	0.349	136
Indonesia	0.144	137	Guinea	0.346	137
Pakistan	0.143	138	Gabon	0.345	138
Bangladesh	0.142	139	Burundi	0.345	139
Botswana	0.141	140	Lesotho	0.333	140
India	0.141	141	Central African Republic	0.318	141
Turkey	0.141	142	Zimbabwe	0.314	142
Japan	0.138	143	Djibouti	0.313	143
Paraguay	0.138	144	Angola	0.311	144
Brazil	0.136	145	Afghanistan	0.307	145
Switzerland	0.136	146	Iraq	0.303	146
Argentina	0.128	147	Congo Republic	0.303	147

China	0.120	148	Congo Democratic Republic	0.302	148
Netherlands	0.112	149	Haiti	0.302	149
Hungary	0.092	150	Equatorial Guinea	0.288	150

Sources: authors

Figure 1: Economic Vulnerability and Economic Resilience Indexes



Source: authors' computations