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Environment Quality and Economic Convergence: Extending Environmental Kuznets Curve Hypothesis.

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Abstract

This paper examines the link between environmental indicators and economic convergence for a large sample of rich and poor countries. While in economic literature income and environment are seen to have an inverted-U shaped relationship (Environment Kuznets Curve hypothesis), it is also well established that an improvement in environmental quality is positively related to economic activity. In the early stage of economic development, the gain from income growth could be cancelled or mitigated by environmental degradation through some channels and create a vicious circle in economic activity unlike in developed countries. This in turn could slow down economic convergence. We empirically assess this issue through an econometric model. We found that environmental degradation affects negatively economic activity and reduces the ability of poor countries to reach developed ones economically.

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1. INTRODUCTION

Environmental protection occupies a significant place in the economic policy of many countries and constitutes a major concern for the international community. This concern expressed at international level, is illustrated at many international meetings and conferences: two Nobel Peace Prizes were awarded to the personalities who raised public awareness on environmental issue (Wangari Maathai 2004 and Al Gore 2007) and it is one of the eight Millennium Development Goals (MDG) adopted by the United Nations in 2000.

Although environmental protection is nowadays an important emerging concept, the search for a large and sustainable pro poor economic growth remains a necessity and a priority for all economies. The simultaneous pursuit of these two objectives, that is the wish of all countries, gives rise to at least one question: what is the relationship between economic activity and environmental degradation? During the early decades, many authors tried to give theoretical and empirical responses to this question and the most popular remains the Environmental Kuznets Curve Hypothesis (EKC). The EKC (Grossman 1995; Grossman and Krueger 1995 ; Torras and Boyce 1998) describes the relationship between declining environmental quality and income as an inverted-U, that is, in the course of economic growth and development, environmental quality initially worsens but ultimately improves with improvements in income level.

The relationship between income and environmental quality should not be limited to the ECK, the environmental degradation in turn can have significant effects on economic activity (Bovenberg and Smulders 1995 and 1996; Bruvoll et al. 1999). These effects impact growth through many channels. This interrelationship between health, environment and economic activity can have different consequences depending on the development level and this can slow down the speed of economic convergence.

The aim of this article is to assess the association between environment quality and economic activity and its consequences on economic convergence. From our knowledge, this paper is the first that links environmental variable and economic convergence.

Our works show that environmental degradation affects negatively economic activity and reduces the ability of poor countries to reach developed ones economically.

The rest of this article is organised in five sections. Section 2 reviews the literature on the relationship between economic activity and environment. Section 3 is devoted to the empirical design. Section 4 presents the results and section 5 concludes.

2. LITERATURE REVIEW

2.1. Economic growth and convergence

Economic convergence, concept introduced in economic literature by Solow (1956) has been largely tested and improved by economists. It was generalized by Barro and Sala-i-Martin (1992), Mankiw, Romer and Weil (1992), Levine and Renelt (1992) through the conditional convergence notion. Conditional convergence implies that countries would reach their respective steady states. Hence, in looking for convergence in a cross country study, it is necessary to control for the differences in steady states of different countries. The choice of control variables is very important because the statistical significant level as well as the coefficient amplitude of the variable of interest is sensitive in this choice (Levine et Renelt 1992). In 1992, Mankiw, Romer and Weil provided an analysis of economic convergence by adding human capital, represented by education level, to Solow (1956) model and they showed that their results fit better to the predictions of Solow model. Knowles and Owen (1995) completed this work by adding health as second human capital.

All these improvements are important but not enough because they do not take into account the role that could play some omitted variables, in particular the environmental quality which arouses a renewed interest these last years with the natural resources curse and EKC hypothesis.

2.2. Consideration of the environmental aspect

The existence of an intrinsic relation between economic activity and environmental quality remains evident. At the theoretical level several authors tried to give an explanation to the way the environment degradation could impact economic activity (Bovenberg and Smulders 1995 and 1996; Bruvoll et al. 1999; Resesudarmo and Thorbecke 1996; Hofkes 1996; Geldrop and Withagen 2000). These theoretical works can be divided into four major categories following Panayotou (2000). Optimal growth models build on a Ramsey (1928) model, as extended by Koopmans (1960) and Cass (1965) constitute the first category (Keeler et al. 1971; Mäler 1974; Gruver 1976; Brock 1977; Becker 1982; Tahvonen and Kuuluvainen 1994; Selden and Song 1995 and Stokey 1998). These are dynamic optimisation model, in which the utility-maximisation problem of the infinitely lived consumer is solved using the techniques of optimal control theory. In general, models of pollution and optimal growth suggest that some abatement or curtailment of growth will be optimal.

The second category considers not only pollution as an argument of production and utility function, but also it includes environment itself as a factor of production (Lopez 1994; Chichilinsky 1994 ; Geldrop and Withagen 2000). This measure of environmental quality can be conceptualized as a stock that is damaged by production or pollution.

The third group is constituted of endogenous growth models that relax the neoclassical specification of the production function assumed in the optimal growth models (Bovenberg and Smulders 1995 and 1996; Hofkes 1996; Ligthhard and Van der Ploeg 1994; Gradus and Smulders 1993 and Stokey 1998). Based on the works of Romer (1986, 1990), these models are characterised by constant or increasing returns to scale to some factors, or a class of factors, because private returns on investment may differ from the social returns on investment, often because of externality effects. This category consists in extending this new growth theory to include the environment or pollution as factor of production and environment quality as an argument of the utility function. In general, optimal pollution control requires a lower level of growth than would be achieved in the absence of pollution.

Finally, we have other models that connect environmental degradation and economic growth. This category includes the overlapping generation model based on diamond (1965), it is the case of John and Pecchenino (1994, 1995). We also have a two country general equilibrium model of growth and environment in presence of trade (Copeland and Taylor 1994). These models reinforce the results of the optimal growth models.

At the empirical level, some economists tried to assess this impact of the environmental degradation on the economic activity. Bruvol et al. (1999) estimated the cost to society of environmental constraints, called environmental drag, in Norwegian economy through a dynamic resource environment applied model (DREAM). Their simulation indicates that the environmental drag reduces annual economic growth rate by about 0.1 percentage point and annual growth in wealth, including environmental wealth, is reduced by 0.23 percentage points until 2030. Resosudarmo and Thorbecke (1996), show through Social Environmental Accounting Matrix (SEAM) and some simulations, that the improvement of environment quality reduces health problems and therefore stimulates economic growth.

The best way to understand how environmental degradation can affect economic growth is to explain the channels through which this occurs. In economic literature we can find implicitly or explicitly some of these channels. Most of the channels met in the literature are the labor supply and labor productivity. Air pollutions by CO2, SO2, NOx, CO, traffic noise, etc. affect health and leave people unable to work over short or long periods and reduce the productivity of those who work. Through its simulation, Bruvoll et al. (1999) show that the health damages increase by 28% from 1989 up to 2030 in Norway because of emissions and these health damages contribute to 39% of the disutility from environmental services in 2030. Several ecological studies show that respiratory and cardiovascular diseases are closely linked to air quality (Poloniecki et al. 1997 ; Samet et al. 2000 ; Schwartz 1999 ; Schwartz and Morris 1995 ; Evans and Smith 2005 ; Peter et al. 2001, Schirnding 2002). Zanobetti et al. (2000) show that the rate of hospitalisation due to cardiovascular diseases increases by 1.27 % when particle PM10 increases by 10 µg/m3.

The other channels have not been broadly developed in the literature. Among them, we have the deterioration of physical capital (Bruvoll et al. 1999 ; Bovenberg et Smulders 1996 ; etc.). In fact, some pollutants such as SO2, induces corrosion on capital equipment and increases road depreciation and thus depreciation of public capital. This increased burden on public expenditures and eventually crowds out private activity (Bruvoll et al. 1999). Another channel is welfare degradation. People receive utility from environmental services like recreational values. Some pollutants, such as SO2 and NOx, contribute to acidification of lakes and forests and others such as CO and PM10, provoke health related suffering. This can discourage foreign direct investment and skilled labour. Finally, environmental quality improvement affects saving behaviour, therefore investment (Ricci 2007).

It is now clear that environment quality affects economic performance. Economic activity in turn deteriorates environment quality and this in almost all the economic sectors (Shafik 1994, Grossman 1995; Grossman and Krueger 1995 ; Torras and Boyce 1998; Mansour 2004; Mansour 2004; Yadav 1997; WRI 1996; Hettige, Mani and Wheeler 1998). This effect of economic activity on environment quality is complex and depends on some factors, namely preferences, production technology and the economic structure which are intrinsically linked to development level. Pollution level depends on gross domestic product (GDP) composition which itself is linked to development level (ECK hypothesis).

The first explanation to the EKC relationship is that the environment can be thought of as a luxury good. In the early stage of economic development a country would be unwilling to exchange consumption for investment in environmental regulation, hence environmental quality declines. When the country reaches the threshold level of income, its citizens start to demand improvement in environmental quality. Another explanation of the EKC hypothesis is that countries pass through technological life cycles, as they move from high polluting technology (agriculture-based economies) to less polluting technology (service-based systems). In addition to these macroeconomic explanations, the EKC hypothesis is supported by some microeconomic foundations (Andreoni and Levinson 2001).

There is therefore a reverse causality between environmental quality and economic activity. This paper discusses the consequence of the interrelationship between environment and economic performance on economic convergence. In fact, this interrelationship provokes different consequences depending on development level if the EKC hypothesis is verified. In countries below EKC income threshold, all attempts to boost economic growth will result in greater environmental degradation. And this will burden economic growth through health and other channels creating a vicious circle. When countries above the EKC income threshold try to boost their economic growth, their environment quality will be improved and therefore they will be in a virtuous circle. That will penalize poor countries by slowing down the speed of convergence.

3. EMPIRICAL ANALYSIS

3.1. Estimation methodology

This section is devoted to the econometric specifications. The analysis is subdivided into two main steps. First, the effect of environment quality on economic outcomes is assessed through the introduction of pollution indicators in an augmented neoclassical growth model. Then, we evaluate how these variables affect the ability of poor countries to catch up the rich ones by adding to the previous model the interaction term between initial gross domestic product (GDP) per capita and environmental variable

Economic growth and environment

Based on the neoclassical augmented growth model, the effect of environment on economic growth could be specified as follows:

$$\mathrm{gdpc}_{it} = \alpha_1 \, gdpc_{it-1} + \alpha_2 envir_{it} + \alpha_k X'_{kit} + \upsilon_{it} \qquad (3.1)$$

Where $gdpc_{it}$ and $envir_{it}$ represent respectively the logarithmic form of GDP per capita and the environment quality of country i in period t. X is the matrix of the control variables introduced in the model and which have been used frequently in the empirical literature.[1] ν_{it} is the error term. The coefficient of the economic catch up variable α_1 is expected to be superior to 0 and inferior to 1 ($0<\alpha_1<1$) to confirm economic convergence hypothesis. We expect α_2 to be inferior to 0 ($\alpha_2<0$).

This econometric model could be estimated through panel data with Ordinary Least Squares. But the application of this estimator to our model suffers from two main problems. The first drawback comes from the endogeneity of environmental variable. This problem arises because of two mains reasons. There is likely a reverse causality in the relationship between environment and economic outcomes. In fact, according to the Environmental Kuznets Curve hypothesis, the development level of a country has significant effect on its level of pollution

[1] These variables are listed in the next subsection.

(Grossman & Krueger, 1995). Environmental indicator could also be a proxy of some variables that have significant effect on economic growth, such as the technology use and the structure of the economy. There is a need to solve for this by using another approach. The instrumental variable methods, and more precisely the Two Steps Least Squares (2SLS) estimator seems appropriated. This estimator applied to our model raises the second problem because of its dynamic characteristic. Indeed it leads to a biased estimation of α_1 since $gdpcap_{it-1}$ and v_{it} are correlated. The Generalized Method of Moments (GMM) applied for dynamic panel data is suitable to estimate consistently the parameter α_1 and also the coefficients of predetermined and endogenous variables. We use the System-GMM estimator which combines equation in level and equation in difference and then exploits additional moment conditions (Blundell and Bond, 1998). Predetermined and endogenous variables are instrumented by both their lagged values in level and lagged values in difference.[2]

Economic convergence and environment

To assess the impact of environment quality on economic convergence, we introduce the interaction term between lag GDP per capita and environment as additional variable into the previous model.

$$\mathrm{gdpc}_{it} = \alpha_1' \, gdpc_{it-1} + \alpha_2 envir_{it} + \alpha_3 (gdpc_{it-1}) * (envir_{it}) + \alpha_k X'_{kit} + \mu_i + \upsilon_{it} \quad (3.2)$$

In this model the catch up coefficient is $\frac{\partial(gdpc_t)}{\partial(gdpc_{t-1})} = \alpha_1' + \alpha_3 * envir$ and this is function of environmental quality. α_1' is expected to be 0< α_1'<1, α_2<0 and α_3>0.

This model is also estimated with the Generalized Method of Moments (GMM).

3.2. Variables and data

This study is based on a panel data of 86 developed and developing countries for which data are available from 1971 to 2000 subdivided into five year periods.[3] The economic outcome is measured by GDP per capita based on purchasing power parity (PPP) in constant 2005 international dollars. This indicator is taken from World Development Indicator (WDI 2008) of the World Bank. Environment quality is represented by three indicators, carbon dioxide emission in metric tons per capita (CO2) and sulphur dioxide emission milligrams per GDP (SO2) for air pollution and Biological Oxygen Demand in milligrams per worker (BOD) for water pollution. The BOD and CO2 are also taken from WDI 2008 while Sulfur dioxide emission (SO2) is from the dataset compiled by David Stern[4] in 2004. As health indicator, we use the logistic form of infant mortality rate. In fact the infant mortality indicator is limited asymptotically, and an increase in this indicator does not represent the same performance when its initial level is weak or high, the best functional form to examine is that where the variable is expressed as a logit, as Grigoriou (2005) underlined. We also use as control variables the Gross Fixed Capital Formation as percentage of GDP, annual population growth rate, economic openness (ratio of the sum of import and export to GDP), household final

[2] The paper uses the two-step System-GMM estimator with the Windmeijer (2005) correction for finite sample bias.

[3] The time periods are1971-1975 ; 1976-1980 ; 1981-1985 ; 1986-1990 ; 1991-1995 ; 1996-2000.

[4] We thank David Stern for the provision of data

consumption per capita, financial development (Money and quasi money as a ratio of GDP), inflation rate, all taken from WDI 2008. Our institutions quality indicator is from polity IV and the variable we use is polity2. Finally, the variable of education quality is from Barro and Lee 2000. The definitions and sources of these variables as well as the list of countries are presented in the appendix A.

4. ECONOMETRIC RESULTS

We begin by discussing the results from the estimation of the growth model (3.1). Then, we carry out the results of the effect of environmental variable on economic convergence (model 4.2).

4.1. Economic growth and environment

The results obtained from the estimation of equation 3.1 are presented in the first three columns of Table 1. The dependent variable is GDP per capita and our variable of interest is environment quality, measured by three different indicators (SO2 per GDP, CO2 per capita and BOD per worker). This equation is estimated with the two-steps System-GMM estimator and environmental variables are taken as endogenous and then instrumented by at least their second order lags.[5]

Table 1

These results suggest that environmental degradations have a negative and statistically significant effect on economic growth whatever the environmental indicator considered. Infant mortality rate also has a negative and significant effect on economic growth. Another interesting result is the coefficient of the catch up variable. Indeed, the coefficient of lagged GDP per capita is around 0.91, this corresponds to a rate of convergence of about 2% per year. That means that, each year poor countries reduce their gap to their steady state to 2 percent. This convergence rate is closed to that found in the literature. All other relevant variables of control present expected signs and are statistically significant at 10% level, except education level which presents the unexpected sign and inflation rate which present instable sign.

4.2. Economic convergence and environment quality

As previously argued, environment quality may reduce the ability of poor countries to catch up developed ones economically. To assess empirically whether pollution affects the speed of convergence, we estimate equation 3.2 with the two-steps System-GMM estimator and environmental variables and the interaction term are taken as endogenous and then instrumented by at least their second order lags. The results obtained are summarized in the last three columns (4, 5 and 6) of table 1. The coefficients of our variables of interest have the correct signs and are statistically significant. Indeed, the lag of GDP per capita and its interaction term with environmental indicators have positive coefficients, while pollution variables have negative coefficients. This means that the speed of convergence of an economy depends on its pollution level. More precisely, a high level of environmental degradation

[5] To prevent the problem of the proliferation of instruments commonly faced in this methodology, we restrict the maximum number of lags at 5, what leads us to a maximum number of instruments equal to 26.

increases the marginal effect of lag GDP per capita on its current level and therefore reduces the speed of convergence. Environment quality can be viewed as an obstacle for developing countries by reducing their ability to get closer to developed countries economically, given the Environmental Kuznets Curve hypothesis.

Regarding the control variables, only investment, health, institutions quality and inflation rate appear statistically significant. In fact, investment and institution quality increase economic growth while high mortality and inflation rates reduce it.

The scarcity of education data reduces the number of countries in our sample, since it is not available for many countries. To deal with that, we take again the estimations without education variable. The results are presented in table 2.

Table 2.

The sample size increases from 68 countries to 86 and the results remain unchanged.

5. CONCLUDING REMARKS

This paper analyzes the relationships between economic activity and environment quality and its consequences on economic convergence process. We introduce environment variable in a growth model and we observe its effect on economic growth. Our results show that environmental degradation affects negatively economic activity and reduces the ability of poor countries to reach developed ones economically. This reinforces our theoretical argument according to which environment quality improvement plays a considerable role in economic convergence process.

Poor countries which have chosen rapid economic growth at the price of environment quality will penalize themselves and have little chance to reach their goal. Such policy can reduce growth through health and other channels. An example of such policy is the use of high among of pesticide in agricultural sector. Poor countries cannot postpone attending environmental concerns in the hope that the environment will improve with increased incomes and avoid poverty trap due to environment degradation. Policy makers in these countries should contrary take into account environmental concerns as promoted by international community through the MDGs.

This paper can also be placed into the debate about development aid effectiveness. In fact, a development assistance based on less polluting production technology will help poor countries to avoid the vicious circles shown in this paper.

One way this research can be extended is to use other environment indicators and compare the results for each indicator. Another way to extend this article is the use of other technical approach in order to confirm our idea or assess the different channels through which pollution affects economic growth. It is also interesting to investigate why and how currently developed countries were able to avoid this vicious circle and emerge from it.

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TABLES.

Table 1: Two-step System-GMM results of the Economic convergence effect of environmental variables

	Dependent variables: GDP per capita PPP in constant value 2005					
	SO2 per GDP	CO2 per capita	BOD per worker	SO2 per GDP	CO2 per capita	BOD per worker
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Log Initial GDP per capita	0.913***	0.917***	0.907***	0.903***	0.936***	0.675***
	(14.73)	(8.73)	(42.12)	(13.40)	(5.19)	(6.74)
(Environment)x(Initial GDP)				2.313**	0.013***	0.910**
				(2.36)	(2.98)	(2.40)
Environmental variables	-0.622**	-0.007*	-0.666*	-16.547**	-0.128***	-7.692**
	(2.00)	(1.93)	(1.66)	(2.36)	(2.94)	(2.42)
Population growth	-0.000	0.003	-0.008	0.001	-0.002	0.006
	(0.06)	(0.53)	(0.99)	(0.33)	(0.26)	(0.53)
Log Schooling	0.013*	0.005	0.011	0.005	0.002	0.014
	(1.94)	(0.45)	(1.16)	(0.75)	(0.19)	(1.07)
Log Investment	-0.015	0.091***	0.051	0.090***	0.134***	0.064*
	(0.44)	(3.68)	(1.64)	(3.26)	(3.36)	(1.85)
Logit health	-0.048***	-0.044***	-0.028*	-0.040***	-0.035***	-0.080***
	(4.03)	(4.15)	(1.77)	(3.26)	(2.66)	(2.63)
Openness	0.056**	0.018	0.037	0.023	0.018	-0.036
	(2.32)	(0.75)	(1.53)	(1.46)	(0.72)	(0.95)
Log Consumption	0.049	0.050	0.043**	0.041	0.018	0.078
	(0.88)	(0.59)	(2.36)	(0.76)	(0.13)	(1.15)
Financial development	-94.851	-66.054	-132.090***	-83.703	-102.375	151.914
	(1.25)	(1.41)	(2.95)	(1.19)	(1.60)	(1.37)
polity2	0.001	0.002**	0.002**	0.003***	0.002**	0.002*
	(1.31)	(2.21)	(1.98)	(2.76)	(2.17)	(1.72)
inflation	0.005*	-0.003***	-0.003***	-0.002***	-0.003***	-0.002***
	(1.72)	(5.44)	(5.91)	(5.18)	(3.70)	(2.60)
Constant	0.228	-0.066	0.357*	0.106	-0.067	1.732***
	(1.31)	(0.30)	(1.93)	(0.69)	(0.17)	(2.85)
Observations	235	239	203	235	239	203
Countries	68	69	63	68	69	63
AR1	0.019	0.009	0.014	0.004	0.010	0.010
AR2	0.127	0.094	0.117	0.128	0.115	0.151
Hansen p-value	0.388	0.156	0.259	0.389	0.285	0.139
Number of instruments	26	17	15	17	17	19

Note: Robust t-statistics in parentheses. Standard errors are corrected by the Windmeijer (2005) method designed for finite sample bias in a two-step System-GMM estimator. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Two-step System-GMM results of the Economic convergence effect of environmental variables without education.

	Dependent variables: GDP per capita PPP in constant value 2005		
	SO2 per GDP	CO2 per capita	BOD per worker
VARIABLES	(1)	(2)	(3)
Log Initial GDP per capita	0.891***	0.870***	0.797***
	(10.59)	(5.83)	(12.29)
(Environment)x(Initial GDP)	1.520*	0.010*	0.690*
	(1.66)	(1.94)	(1.94)
Environmental variables	-11.060*	-0.105*	-5.832*
	(1.69)	(1.94)	(1.96)
Population growth	-0.000	-0.003	-0.001
	(0.07)	(0.38)	(0.11)
Log Investment	0.068**	0.124***	0.056*
	(2.28)	(2.81)	(1.92)
Logit health	-0.031***	-0.014	-0.050**
	(2.71)	(0.84)	(2.47)
Openness	0.031	0.067*	-0.013
	(1.27)	(1.79)	(0.40)
Log Consumption	0.055	0.078	0.015
	(0.78)	(0.67)	(0.54)
Financial development	-45.268	-131.795*	103.831
	(0.76)	(1.72)	(1.10)
polity2	0.002**	0.002	0.002*
	(1.99)	(1.63)	(1.74)
inflation	-0.003***	-0.002***	-0.003***
	(5.88)	(3.73)	(7.03)
Constant	0.214	0.131	1.315**
	(1.19)	(0.35)	(2.18)
Observations	287	292	233
Countries	84	86	73
AR1	0.006	0.017	0.003
AR2	0.129	0.150	0.106
Hansen p-value	0.191	0.210	0.545
Number of instruments	13	18	14

Note: Robust t-statistics in parentheses. Standard errors are corrected by the Windmeijer (2005) method designed for finite sample bias in a two-step System-GMM estimator. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX A:

Table A1 : Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP per capita	259	11212.43	10918.89	355.8692	55491.52
Inf. Mort. rate	259	36.90442	33.55625	3.48	138.656
SO2 per GDP	253	0.0069203	0.017175	0.0000922	0.1760821
CO2 per capita	259	5.060414	5.543132	0.0319344	35.87007
BOD per worker	256	0.1950967	0.0519381	0.0694487	0.4478187
Pop. growth	259	1.337404	3.075527	-44.40836	5.603235
school	211	23.11564	22.01362	0	84.1
investment	258	20.90701	5.34708	9.488747	40.29905
openness	256	68.85741	39.29941	2.003065	238.6728
consumption	219	4469.355	5270.451	87.23995	22281.84
Financial Dev.	221	44.7538	32.07666	9.198633	227.4642
polity2	226	3.879646	6.691901	-10	10
Inflation rate	254	38.59134	190.1751	-1.659683	2342.221

Table A3 : list of countries in the sample

Country	Country
Albania	Kuwait
Argentina	Lao PDR
Australia	Morocco
Benin	Madagascar
Burkina Faso	Mexico
Bangladesh	Mali
Bulgaria	Mozambique
Bolivia	Mauritania
Brazil	Mauritius
Bhutan	Malawi
Botswana	Malaysia
Central African Republic	Norway
Canada	New Zealand
Switzerland	Pakistan
Chile	Panama
China	Peru
Cote d'Ivoire	Philippines
Cameroon	Poland
Colombia	Paraguay
Costa Rica	Romania
Denmark	Rwanda
Dominican Republic	Saudi Arabia
Algeria	Sudan
Ecuador	Senegal
Egypt, Arab Rep.	El Salvador
Gabon	Sweden
Ghana	Swaziland
Gambia, The	Syrian Arab Republic
Guinea-Bissau	Chad
Equatorial Guinea	Togo
Guatemala	Thailand
Guyana	Trinidad and Tobago
Honduras	Tunisia
Hungary	Turkey
Indonesia	Tanzania
India	Uganda
Iran, Islamic Rep.	Uruguay
Israel	United States
Jordan	Venezuela, RB
Japan	Vietnam
Kenya	South Africa
Cambodia	Congo, Dem. Rep.
Korea, Rep.	Zambia