E C O N O M I C S B U L L E T I N

A Dynamic Model of Foreign Aid Allocation

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Abstract

This paper uses the Generalized Method of Moments (GMM)-type of estimator of Arellano and Bond (1991) to analyze the dynamics of adjustment in foreign aid allocation over the period 2000-2005. The empirical findings reveal a complex nature of foreign aid allocations. On the one hand, the static panel data models indicated that aid donors tended to provide larger amounts of foreign aid to the poorer developing nations which were in a greater need for the development assistance. On the other hand, the dynamic panel data models indicated contradicted results, where relatively wealthy developing countries have received larger amounts of foreign aid.

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1. Introduction

Developed countries have been allocating vast amounts of funds as foreign aid to developing nations. For example, in 2006, the 22 member countries of the Development Assistance Committee (DAC) disbursed US$103.9 billion as foreign aid. Among the DAC countries, the United States was the top aid donor in 2006 providing US$22.7 billion as foreign aid. The second biggest donor in 2006 was the United Kingdom that distributed US$12.6 billion as foreign aid. It was followed by Japan that disbursed US$11.6 billion as foreign aid. (OECD, 2007).

International movement of such a vast amount of money has attracted keen attention of researchers. The efficacy of Official Development Assistance (ODA) programs by developed countries has been subject to scrutiny and criticism. Some researchers maintained that foreign aid did not "work" and had not been able to help achieve the desired economic development in aid recipient countries (Bauer, 1981; Friedman, 1958; Mosley, 1987).

Another aspect of foreign aid activities that has attracted a lot of criticism is the allocation of foreign aid funds. The main line of argumentation used by the ODA critics has been that aid donor countries fail to provide foreign aid to the needy countries. The criticism has been so widespread that even standard textbooks on economic development include a discussion on this issue. For example, Todaro (2000) argued that foreign aid was allocated in an "arbitrary way" and "the allocation of foreign aid is rarely determined by the relative needs of developing countries" (p.593).

Taking into account the criticisms regarding foreign and allocations briefly outlined above and the recent changes and tendencies in the movement of foreign aid funds, this paper aims to examine whether aid donors allocated their foreign aid according to the needs of aid recipient countries. This paper uses the Generalised Method of Moments (GMM)-type of estimator of Arellano and Bond (1991) to analyse the dynamics of adjustment in foreign aid allocation over the period 2000-2005.[1]

Numerous quantitative research studies have been done on foreign aid allocations (Bandyopadhyay & Wall, 2006; Burnside & Dollar, 2000; Cingranelli & Pasquarello, 1985; Dudley & Montmarquette, 1976; Furuoka, 2005; Neumayer, 2003; Svensson, 2000; Trumbull & Wall, 1994). However, these studies could not reach an unambiguous conclusion regarding foreign aid allocations and the results that the studies yielded were often contradictory.

An earlier study on the developed countries' ODA allocation was conducted by OECD (1969) and it reported one peculiar tendency in ODA allocations, which was the "small country effect" or the "population bias". However, Dudley and Montmarquette (1976), did not agree with this conclusion and argued that "an important result is that there is no uniform evidence of distortion in the direction of small beneficiary countries" (p.140). On the other hand, Trumbull and Wall's (1994) reported that evidence supporting the "small

[1] The paper uses the Dynamic Panel Data (DPD) soffware package for estimating dynamic panel data model.

country effect" was present when the researchers used the one-way fixed effects model. However, when the two-way fixed effects model was used, no significant relationship between the aid allocations and the size of population was detected.

Burnside and Dollar (2000) argued that the smaller developing countries "get more aid" (p.862). Svensson (2000) reached a similar conclusion and pointed out that the log of population was "highly significant" (p.450). However, Neumayer (2003) concluded, "Most donors, particularly the small ones, select more populous countries with higher probability" (Neumayer, 2003, p.658).

The relationship between foreign aid allocations and per capita income in the recipient countries is yet one more feature in the aid giving activities that has generated a considerable research interest (Bandyopadhyay & Wall, 2006; Dudley & Montmarquette, 1976; Trumbull & Wall, 1994). Dudley and Montmarquette (1976) concluded, "The model suggested that the probability of granting aid was a decreasing function of the recipient's per capita income" (Dudley and Montmarquette, 1976, p.142). Trumbull and Wall (1994) also reported a significant negative relationship in the one-way fixed effects model; however, the two-way fixed effects model detected a negative but non-significant relationship between the variables.

Among the more recent academic inquiries on the topic, Bandyopadhyay and Wall (2006) produced evidence that aid flows tended to respond negatively to per capita incomes in aid recipient countries and concluded that there was a negative relationship between aid allocations and income levels in the recipient countries, which was "in contrast with much of the existing literature" (p.13).

Among individual aid donor countries, US bilateral aid allocations have been thoroughly researched. The findings of these studies were contradictory. For example, Shoultz (1981) concluded that there had been no connection between US foreign aid flows and human rights conditions in aid recipient countries. In a similar vein, Stohl, Carleton, and Johnson (1984) maintained that no obvious relation could be found between the aid recipients' observance of human rights and US aid allocations. However, Cingranelly and Pasquarello's (1985) study that used cross-country econometric model reported that human rights situation in aid recipients had influenced the allocations of US foreign aid.

Some researchers have focused on Japan's ODA activities (Furuoka, 2005; Hook & Zhang, 1998; Katada & McKeown, 1998). Hook and Zhang (1998) concluded that Japanese aid allocations were motivated by the donor country's interests rather than the recipient countries' needs. Katada and McKeown (1998) agreed that Japan's ODA program was not motivated by the recipient countries' needs as they found no significant relationship between per capita income in aid recipients and Japanese aid flows. On other hand, Furuoka (2005) concluded, "The findings reveal the lack of evidence to prove that human rights condition in aid recipient countries has influenced the allocation of Japanese aid" (p.125). However, this conclusion is in sharp contrast to Neumayer's (2003) study that identified Japan as one of two aid donor countries that allocated more foreign aid to the developing nations with better human rights record.

2. Data and Methodology

This paper uses the Generalised Method of Moments (GMM)-type of estimator of Arellano and Bond (1991) to analyse the dynamics of adjustment in foreign aid allocation over the period 2000-2005. The main source of data is World Bank's internet database -- *World Development Index Data-Query* (World Bank, 2007). The panel consists of one hundred fifty two (152) aid recipient countries. This includes all the developing countries in six regions, i.e. 1) East Asia and the Pacific, 24 countries, 2) Europe and Central Asia, 27 countries, 3) Latin America and the Caribbean, 31 countries, 4) Middle East and North Africa, 14 countries, 5) South Asia, 8 countries, 6) Sub-Saharan Africa, 48 countries.

In the current study, ODA allocations are hypothesized to be determined by four factors, i.e., 1) aid recipients' income (*GNI*), 2) aid recipients' debt services (*TDS)*, 3) aid recipients' terms of trade (*TT*), and 4) aid recipients' populations (*POP*). First of all, income level in aid recipient countries could be an important determinant for aid allocations because the countries with low per capita incomes have a greater need for foreign aid compared to the lower-middle income countries or the higher-middle income countries. This study hypothesises that the countries with lower per capita Gross National Income (GNI) received bigger amounts of foreign aid.

Secondly, aid donors might be inclined to provide larger amounts of foreign aid to the recipient countries that are burdened with heavy external debts and suffer from the deteriorating terms of trade. Low saving rate and high current account deficit are among the reasons why developing countries accumulate external debt. The main cost associated with the accumulation of external debts can be described as "debt service" (Todaro, 2000, pp. 549-550).[2] Thirdly, developing countries are vulnerable to the declines in the terms of primary commodity trade. In the 1950s, Prebisch (1950) and Singer (1950) warned that there had been a secular decline in the terms of trade. More recently, Todaro (2000) pointed out that "empirical studies suggest that real primary-product prices have declined at an average annual rate of 0.6% since 1900" (p.446).

Finally, the size of population is important to consider because more populous developing countries may need greater amounts of foreign aid. Also, these countries are more likely to experience higher unemployment rates and lower productivity. Large population has been considered an impediment for the developing countries' economic growth. According to Simon (1997), there has been consensus that large population in a developing country could lead to a reduction in machinery and infrastructure per person, and hence to a reduction in output per person.

To incorporate the four factors discussed above, there will be one dependent and four independent variables in the model, and the foreign aid allocation function could take a form:

$$LODA_{it} = f\,(LGNI_{it}, LTDS_{it}, LTT_{it}, LPOP_{it}), \qquad (1)$$

[2] The debt service is the sum of principal repayments and interest (World Bank, 2007).

where $LODA_{it}$ is the natural log of the amount of Official Development Assistance (ODA) per capita to recipient country i in year t; it includes loans made on concessional terms as well as grants; the amount is denominated in US dollars. $LGNI_{it}$ is the natural log of Gross National Income (GNI) per capita in recipient country i in year t; the amount is in US dollars. $LTDS_{it}$ is the natural log of the percentage of total debt services in the total amount of exports of goods and services in recipient country i in year t. Total debt services include the sum of principal repayment and interest. LTT_{it} is the natural log of the net barter terms of trade. The net barter terms of trade is the percentage ratio of the export prices to the import prices in aid recipient country i in year t. The base year is 2000, where the terms of trade index is set at 100. In the following year, the index is measured relative to the base year. $LPOP_{it}$ is the natural log of the total population in recipient country i in year t.[3]

Three separate methods are used in the present study to analyse the following four models: 1) restricted model, 2) period-specific fixed effects model, and 3) period-specific random effects model, 4) dynamic panel data model. This paper did not include recipient-effects in the model. There are three main reasons for this model specification. Firstly, the number of recipient countries included in this study is 152. Estimation of recipient-specific fixed effects could cause an enormous loss of the degree of freedom. Secondly, the two-way fixed effects model which includes both recipient-effects and period-effects could cause multicollinearity problems among the regressors (Baltagi, 2005). Thirdly, there are missing data due to a fact that many developing countries are unable to maintain good statistical data sets; the estimation of a two-way random effects model for the balanced data cannot be easily extended to the unbalanced data. Finally, the foreign aid allocation can be dynamic in nature. The usage of dynamic panel data model can allow researchers to better understand the dynamics of adjustment (Baltagi, 2005).

The restricted model contains only a constant term:

$$y_{it} = \alpha + x_{it}'\beta + \varepsilon_{it}, \qquad (1)$$

where y_{it} is the regressand; α is the constant; x_{it} is the K regressor vector; β is the $K \times 1$ slope vector; ε_{it} is the error term; K is the number of regressors.

Panel data analysis is better suited for the cases where there exist unobservable period-effects. If the period-effects are correlated with the regressors, the fixed-effects model could be used. On the other hand, if the period-effects are not correlated with the regressors, the random-effects model could be used (Greene, 2003). In order to incorporate period-specific effects, the fixed effects model could take a form:

$$y_{it} = \alpha + \alpha_t + x_{it}'\beta + \varepsilon_{it}, \qquad (2)$$

[3] For more detail on the definition of variables, see World Bank (2007). In the World Bank's database, ODA_{it} is codified as "DT.ODA.ALLD.CD", GNI_{it} as "NY.GNP.PCAP.CD", TT_{it} as "TT.PRI.MRCH.WD", TDS_{it} as "DT.TDS.DECT.EX.ZS", POP_{it} as "SP.POP.TOTL".

where α_t is the period-specific fixed effects. The fixed effect model could be transformed into a vector form:

$$y = \alpha\, \iota_{NT} + Z_\alpha \alpha + x\beta + \varepsilon_{it}, \qquad (3)$$

where ι_{NT} is the NT-element unit vector; N is the number of recipient countries; T is the number of years; y is the $NT \times 1$ matrix; x is the $NT \times K$ matrix. Furthermore, $Z_\alpha \alpha$ could be expressed as:

$$Z_\alpha \alpha = (I_T \otimes \iota_M)\, \alpha \qquad (4)$$

where I_T is the T-element identify matrix; $\otimes$ is the Kronecker Product; I_M is the M-element unit vector; α is the vector of period-effects, i.e. $\alpha' = (\alpha_1\ \alpha_2\ \alpha_3 \ldots . \alpha_T)$; Z_α is the matrix of period-specific dummy that one may include in the regression to estimate α_t (Baltagi, 2005). For example, if the number of recipient countries is two ($N = 2$) and the number of years is three ($T = 3$), the fixed effects model in this study could be written as:

$$\begin{pmatrix} LODA_{11} \\ LODA_{12} \\ LODA_{13} \\ LODA_{21} \\ LODA_{22} \\ LODA_{23} \end{pmatrix} = \alpha \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} + \begin{pmatrix} 100 \\ 010 \\ 001 \\ 100 \\ 010 \\ 001 \end{pmatrix} \begin{pmatrix} \mu_1 \\ \mu_2 \\ \mu_3 \end{pmatrix} + \begin{pmatrix} LGNI_{11} LTDS_{11} LTT_{11} LPOP_{11} \\ LGNI_{12} LTDS_{12} LTT_{12} LPOP_{12} \\ LGNI_{13} LTDS_{13} LTT_{13} LPOP_{13} \\ LGNI_{21} LTDS_{21} LTT_{21} LPOP_{21} \\ LGNI_{22} LTDS_{22} LTT_{22} LPOP_{22} \\ LGNI_{23} LTDS_{23} LTT_{23} LPOP_{23} \end{pmatrix} \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{pmatrix} + \begin{pmatrix} \varepsilon_{11} \\ \varepsilon_{12} \\ \varepsilon_{13} \\ \varepsilon_{21} \\ \varepsilon_{22} \\ \varepsilon_{23} \end{pmatrix} \qquad (5)$$

In the fixed effects model, the slope parameter could be estimated by

$$\hat{B} = \frac{\sum_{i=1}^{N}\sum_{i=1}^{T}(x_{it} - \bar{x}_i)(y_{it} - \bar{y}_i)}{\sum_{i=1}^{N}\sum_{i=1}^{T}(x_{it} - \bar{x}_i)^2} \qquad (6)$$

where $\bar{y}_i = \sum_{t=1}^{T} \frac{y_{it}}{T}$. $\bar{x}_i = \sum_{t=1}^{T} \frac{x_{it}}{T}$

On the other hand, the period-specific random effects model could be written as:

$$y_{it} = \alpha + u_t + x_{it}'\beta + \varepsilon_{it}, \qquad (7)$$

where u_t is the period-specific random effects. The period-specific random effects model could be estimated by using Feasible Generalized Least Square (FGLS) estimation. The slope parameters in this model could be express as:

$$\hat{\beta} = (x'\Omega^{-1}x)^{-1}x'\Omega^{-1}y, \qquad (8)$$

where Ω is the disturbance covariance matrix. The present paper uses two methods to estimate the disturbance covariance matrix. Wallace and Hussain (1966) suggested that the residuals from the restricted model (1) could be used for the estimation of the covariance matrix. On the other hand, Wansbeek and Kapteyn (1989) suggested using the residual from the fixed-effects model (2).

The dynamic panel data models can be expressed as

$$y_{it} = \alpha + y_{i,t-1} + \alpha_t + x_{i,t}'\beta + \varepsilon_{it}, \qquad (9)$$

These dynamic panel data models of foreign aid allocation are characterised by presence of lagged dependent variable among the regressors (Baltagi, 2005).

3. Empirical Results

Results of the static panel data estimation are reported in Table 1. The multiple coefficient of determination (R^2) in the restricted model is 0.556. In the period-specific fixed effects model, R^2 is 0.568. In the Wallace and Hussain estimation for the period-specific random effects model, R^2 is 0.564. In the Wansbeek and Kapteyn estimation for the random effects model, R^2 is 0.564.

This is an interesting finding because all the four estimations produced very similar results. Firstly, there is a very strong significant negative relationship between *LODA* and *LGNI*. This means that aid donors tended to give less foreign aid to the relatively wealthy developing nations. Secondly, the results indicate a very strong significant negative relationship between *LODA* and *LPOP*. This means that aid donors allocated smaller amounts of foreign aid to the more populous developing countries. Another interesting finding of the current study is that a significant positive relationship between *LODA* and *LTT* was detected. This means that the developing countries with more favourable terms of trade received larger amounts of foreign aid from aid donors.

Table 1: Static Panel Data Estimation

Dependent variable: *LODA*

	Restricted model	Fixed effects model	Random effects model (Wallace and Hussain)	Random effects Model (Wansbeek and Kapteyn)
LGNI	-0.422 (-12.020)**	-0.441 (-12.567)**	-0.436 (-12.423)**	-0.435 (-12.436)**
LTDS	0.046 (1.308)	0.068 (1.913)	0.061 (1.717)	0.061 (1.730)
LTT	0.990 (3.909)**	0.894 (3.517)**	0.927 (3.993)**	0.925 (3.656)**
LPOP	-0.532 (-26.672)**	-0.537 (-27.105)**	-0.535 (-27.038)**	-0.535 (-27.052)**
Constant	9.947 (8.466)**	10.539 (8.905)**	10.343 (8.774)**	10.355 (8.784)**
Overall Significance(F test)	189.31**	87.64**	195.74**	194.84**
R^2	0.556	0.568	0.564	0.564
Adjusted R^2	0.553	0.561	0.561	0.561

Numbers in parentheses are t-statistics

** indicates significance at the 0.01 level

Results of the dynamic panel data estimation are reported in Table 2. The first Wald test is used to test the joint significance of all regressors, except time dummies. The null hypothesis that the estimated coefficients are simultaneously zero is rejected at the 0.05 significance level. On the other hand, the second Wald test is used to test the joint significance of time dummies, including the constant in the first-differenced model. The null hypothesis could not be rejected.

The Sargan test of over-identifying restriction is reported. The null hypothesis of the validity of the instrument could be rejected. The AR test for order 1 indicates that null hypothesis of no first-order autocorrelation is rejected at the 0.01 level of significance. On the other hand, AR test for order 1 shows that null hypothesis of no second-order autocorrelation could not be rejected. These findings are considered to be important because the consistency of GMM estimator relied upon the fact of no second-order autocorrelation for the disturbances of the first-differenced equation (Baltagi, 2005).

The Table 2 reports a very interesting fact that there is a significant *positive* relationship between *LODA* and *LGNI*. This means that aid donors tended to give more foreign aid to the relatively wealthy developing nations. It implies that over the observation period

2000-2005 aid donors tended to give more foreign aid to the relatively wealthy developing nations. In other words, relatively rich developing countries which needed less foreign aid tended to receive greater amounts of the development assistance. This finding is sharply contradicted with the findings of some previous studies (Bandyopadhyay & Wall, 2006; Trumbull & Wall, 1994).

Table 2: Dynamic Panel Data Estimation

Dependent variable: *LODA*

LODA(-1)	0.051 (0.71)	Wald test (joint)	11.34*
LGNI	0.493 (2.18)*	Wald test (time dummy)	2.719
LTDS	0.086 (0.06)	Sargan test	10.11
LTT	0.621 (1.85)	AR(1) test	-3.529**
LPOP	0.649 (0.48)	AR(2) test	0.080
Constant	0.081 (1.47)		

Numbers in parentheses are t-statistics
** indicates significance at the 0.01 level
* indicates significance at the 0.05 level

In short, the findings of the panel data analysis revealed a highly complex nature of foreign aid allocations. Thus, on the one hand, the static panel data models indicated that aid donors tended to provide larger amounts of foreign aid to the poorer developing nations which were in a greater need for the development assistance. On the other hand, the dynamic panel data models indicated contradicted results, where relatively wealthy developing countries have received larger amounts of foreign aid.

4. Conclusion

The current paper aimed to explore the main determinants of foreign aid allocations, including bilateral and multilateral foreign aid, over the period 2000-2005 using both the static and dynamic panel data model. The analysis of the static panel data model yielded four main findings. Firstly, the poorer developing countries did tend to receive larger amounts of foreign aid. Secondly, relatively small in terms of population developing countries received more foreign aid from the aid donors, which provided additional evidence in support of the "small country effect". Thirdly, developing countries with

more favourable terms of trade received more foreign aid than the countries with less favourable terms of trade. Fourthly, no empirical evidence was found to support the hypothesis that the developing countries with heavier debt burden were allocated larger chunks of foreign aid. However, the analysis of the dynamic panel data models showed the contradicted results. The aid donors tended to give more foreign aid to the relatively wealthy developing nations

The empirical findings reveal a complex nature of foreign aid allocations. On the one hand, the static panel data models indicated that aid donors tended to provide larger amounts of foreign aid to the poorer developing nations which were in a greater need for the development assistance. On the other hand, the dynamic panel data models indicated contradicted results, where relatively wealthy developing countries have received larger amounts of foreign aid.

References

Arellano, M and Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equation, *Review of Economic Studies, 58,* 277-297.

Baltagi, B. (2005). *Econometric analysis of panel data*. West Sussex: John Wiley & Sons.

Bandyopadhyay, S., & Wall, H. (2006). The determinants of aid in the post-Cold War era, *Federal Reserve Bank of St. Louis Working Paper Series 2006-021B*, 1-23.

Bauer, P. (1971). *Dissent on development.* London: Weidenfield and Nicholson

Burnside, C., & Dollar, D. (2000). Aid, policy and growth. *American Economic Review, 90*, 847-868.

Cingranelli, D., & Pasquarello, T. (1985). Human rights practice and the distribution of US foreign aid to Latin American countries. *American Journal of Political Sciences, 29***,** 539-563.

Dudley, L., & Montmarquette, C. (1976). A model of the supply of bilateral foreign aid. *American Economic Review, 66*, 132-142.

Easterly, W. (2003). Can foreign aid buy growth? *Journal of Economic Perspective, 17*, 23-48.

Friedman, M. (1958). Foreign economic aid. *Yale Review, 47*, 500-516.

Furuoka, F. (2005). Human rights conditionality and aid allocation: Case study of Japanese foreign aid policy. *Perspectives on Global Development and Technology, 4,* 125-146.

Greene, W. H. (2003). *Econometric analysis.* New Jersey: Prentice-Hall, Inc.

Hook, S., & Zhang, G. (1998). Japan's aid policy since the Cold War: Rhetoric and reality. *Asian Survey, 38*, 1051-1066.

Katada, S., & McKeown, T. (1998). Aid politics and electoral politics. *International Studies Quarterly, 42*, 591-609.

Mosley, P. (1987). *Overseas aid: Its defence and reform.* Brighton: Wheatsheaf.

Neumayer, E. (2003). Do human rights matter in bilateral aid allocation? A quantitative analysis of 21 donor countries. *Social Science Quarterly, 84*, 650-666.

Organization for Economic Co-operation and Development (OECD) (1969). *Development Assistance.* Paris: OECD.

Organization for Economic Co-operation and Development (OECD) (2007). *Development co-operation directorate*. Retrieved October 18, 2007, from http://www.oecd.org/document/17/0,3343,en_2649_34447_38341265_1_1_1_1,00.html

Prebisch, R. (1950). *The economic development of Latin America and its principal problems.* New York: United Nations.

Schoultz, L. (1981). U.S. foreign policy and human rights violations in Latin America: A comparative analysis of foreign aid distributions. *Comparative Politics, 13*, 149-170.

Singer, H. W. (1950). The distribution of gains between borrowing and investing countries. *American Economic Review, 40*, 473-485.

Simon, J. L. (1997). Introduction. In J. L. Simon (Ed.), *Economics of population: Key modern writings, volume 1* (pp.13-22). Lyme, NH: Edward Elgar Publishing, Limited.

Stohl, M., Carleton, D., & Johnson, S. (1984). Human Rights and U.S. Foreign Assistance from Nixon to Carter. *Journal of Peace Research, 2,* 1-11.

Svensson, J. (2000). Foreign aid and rent-seeking. *Journal of International Economics*, *51*(2), 437-461.

Todaro, M. (2000). *Economic Development* (7th ed.). Harlow, Essex: Pearson Education Limited.

Trumbull, W., & Wall, H. (1994). Estimating aid-allocation criteria with panel data. *The Economic Journal, 104,* 876-882.

Wallace, D., & Hussain, A. (1966). The use of error components model in combining cross-section and time-series data. *Econometrica, 37*, 55-72.

Wansbeek, T., & Kapteyn, A. (1989). Estimation of error components model with incomplete panels. *Journal of Econometrics, 41*, 341-361.

World Bank (2007). *World development index data-query*. Retrieved October 19, 2007, from http://devdata.worldbank.org/data-query/

Appendix 1
List of Developing Countries Included in this Study

I) East Asia and Pacific (Developing countries only), 24 countries
1) American Samoa, 2) Cambodia, 3) China, 4) Fiji, 5) Indonesia, 6) Kiribati,7) Korea, Dem. Rep., 8) Lao PDR, 9) Malaysia, 10) Marshall Islands, 11) Micronesia, Fed. Sts., 12) Mongolia, 13) Myanmar, 14) Northern Mariana Islands, 15) Palau, 16) Papua New Guinea,17) Philippines, 18) Samoa, 19) Solomon Islands, 20) Thailand, 21) Timor-Leste, 22) Tonga, 23) Vanuatu, 24) Vietnam

II) Europe and Central Asia (Developing countries only), 27 countries
1) Albania, 2) Armenia, 3) Azerbaijan, 4) Belarus, 5) Bosnia and Herzegovina, 6) Bulgaria, 7) Croatia, 8) Czech Republic, 9) Estonia, 10) Georgia, 11) Hungary, 12) Kazakhstan, 13) Kyrgyz Republic, 14) Latvia, 15) Lithuania, 16) Macedonia, FYR, 17) Moldova, 18) Poland, 19) Romania, 20) Russian Federation, 21) Serbia and Montenegro, 22) Slovak Republic, 23) Tajikistan, 24) Turkey, 25) Turkmenistan, 26) Ukraine, 27) Uzbekistan

III) Latin America and the Caribbean (Developing countries only), 31 countries
1) Argentina, 2) Barbados, 3) Belize, 4) Bolivia, 5) Brazil, 6) Chile, 7) Colombia, 8) Costa Rica, 9) Cuba, 10) Dominica, 11) Dominican Republic, 12) Ecuador, 13) El Salvador, 14) Grenada, 15) Guatemala, 16) Guyana, 17) Haiti, 18) Honduras, 19) Jamaica, 20) Mexico, 21) Nicaragua, 22) Panama, 23) Paraguay, 24) Peru, 25) St. Kitts and Nevis, 26) St. Lucia, 27) St. Vincent and the Grenadines, 28) Suriname, 29) Trinidad and Tobago, 30) Uruguay, 31)Venezuela, RB

IV) Middle-East and North Africa (Developing countries only), 14 countries
1)Algeria, 2)Djibouti, 3)Egypt, Arab Rep., 4)Iran, Islamic Rep., 5)Iraq, 6)Jordan, 7)Lebanon, 8)Libya, 9)Morocco, 10)Oman, 11)Syrian Arab Republic, 12)Tunisia 13)West Bank and Gaza, 14)Yemen, Rep.

V) South Asia, 8 countries
1) Afghanistan, 2) Bangladesh, 3) Bhutan, 4) India, 5) Maldives, 6) Nepal, 7) Pakistan, 8) Sri Lanka

VI) Sub-Saharan Africa, 48 countries
1) Angola, 2) Benin, 3) Botswana, 4) Burkina Faso, 5) Burundi, 6) Cameroon, 7) Cape Verde, 8) Central African Republic, 9) Chad, 10) Comoros, 11) Congo, Dem. Rep., 12) Congo, Rep., 13) Cote d'Ivoire, 14) Equatorial Guinea, 15) Eritrea, 16) Ethiopia, 17) Gabon, 18) The Gambia, 19) Ghana, 20) Guinea, 21) Guinea-Bissau, 22) Kenya, 23) Lesotho, 24) Liberia, 25) Madagascar, 26) Malawi, 27) Mali, 28) Mauritania, 29) Mauritius, 30) Mayotte, 31) Mozambique, 32) Namibia, 33) Niger, 34) Nigeria, 35) Rwanda, 36) Sao Tome and Principe, 37) Senegal, 38) Seychelles, 39) Sierra Leone, 40) Somalia, 41) South Africa, 42) Sudan, 43) Swaziland, 44) Tanzania, 45) Togo, 46) Uganda, 47) Zambia, 48) Zimbabwe.