Foreign Direct Investment and CO$_2$, CH$_4$, N$_2$O, Greenhouse Gas Emissions: A Cross Country Study

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ABSTRACT

To investigate the effects of foreign direct investment on CO$_2$, CH$_4$, N$_2$O, and other greenhouse gas emissions, the study was conducted. The panel data from 200 countries were collected for the period of 1990 to 2018. Ordinary least square (OLS), pooled ordinary least square (POLS), Driscoll-Kraay (DK), Second stage least square (2SLS), generalized methods of moments (GMM) model has been performed. The findings showed that foreign direct investment has a positive impact on CO$_2$ in all models. The study also showed that FDI had a negative impact on CH$_4$ emission and a positive impact on N$_2$O emissions in all models except GMM model. Finally, FDI had mixed impact on greenhouse gas emissions, but the results were statistically insignificant except OLS model.

Keywords: CO$_2$, CH$_4$, N$_2$O, Greenhouse Gas emission, FDI

JEL Classifications: F21, O44, Q5

1. INTRODUCTION

The environmental impacts of FDI (foreign direct investment); sustainability of FDI and its effect on the environment; and cross-border environmental implications are the areas of debate in which the FDI-Environment Relationship considers its status for study. The literature has progressed to the point that no clear or conclusive consensus on the meaning has been reached (Cole et al., 2017; Pazienza, 2014), which is particularly true in the first vein of the sentence, for which it is commonly argued that further research is required (Shao, 2018; Zheng and Sheng, 2017; Seker et al., 2015; McAusland, 2010; OECD, 2002a). It has been noted that there has been a greater focus on the relationship between FDI and the atmosphere in this specific thematic area. The majority of the work has been completed, and continues to be done, using various aggregated FDI statistics (e.g. Bakhsh et al., 2017; Shahbaz et al., 2015, 2011; Liang, 2006). According to Marques and Caetano (2020), the supply of goods and services would begin to rise as a result of globalization, which would inevitably encourage a nation’s economic growth. However, one aspect of globalization that has piqued economists’ interest is the flow of polluting industries between countries. This issue may be caused by inconsistencies in environmental regulations and the failure of instruments to control pollution. The Panel on Autoregressive Distributed Lag was used to calculate the impact of FDI on carbon dioxide and other significant greenhouse gas emissions with this viewpoint in mind. Their data were collected from 21 countries with different income levels for a period of 2001 to 2017. This approach permitted the study of the resulting emission dynamics in the short and long term.

A deeper understanding of the consequences of FDI flows requires the qualities of efficiency, imagination, and power. Control continues to increase pollution in high-income countries, so it’s
worth debating more. The Pollution Haven Theory states that FDI reduces emissions in high-income countries while increasing emissions in middle-income countries. However, middle-income countries’ willingness to absorb technology will become crucial in the long run. Environmental policy has a major impact on trade in middle-income countries. Our mission is to comprehend the transfer of emissions from polluting industries, which is why we conducted a thorough examination of the industrial sector’s total green house gas pollution. It has also been discovered that policymakers do not pay enough attention to how innovation contributes to environmental degradation.

This paper has five sections. Section two discusses the review of the literature. Section three is the methods. Section four is about the findings and discussion and finally section five of this paper give some recommendations and conclusion.

2. LITERATURE REVIEW

While panel data analyses using aggregated data, such as those conducted by Hoffmann et al. (2005), Sadorsky (2010), Pao and Tsai (2011), and Kim and Adilov (2012), have been unable to confirm a near relationship between energy intensity and FDI or emission and FDI, firm level analyses conducted by Blackman and Wu (1999) and Fisher-Vanden et al. (2004) have shown that FDI has a reduced impact on energy intensity. Furthermore, Hoffmann et al. (2005) discover that the causal relationship transfers to country groups that were identified by the Granger Causality Approach screen as having high per capita income. In addition, Eskeland and Harrison (2003), Merican et al. (2007), Lee (2009), Tang (2009), and Chang (2012) have identified a transformation in bilateral relations using time series analyses. Panel data analyses produce more reliable and statistically powerful results than cross-section and time series analyses since the sample size is larger. There may be some variation in the estimated parameters for each particular panel, however (country). Furthermore, the topic of heterogeneity will influence bias estimation. Furthermore, cross-sectional dependence may lead to erroneous conclusions. The chosen panel data approach should then take into account variability and cross-sectional dependency concerns.

Adams (2009) revealed that FDI had an initial negative influence on DI and subsequent positive influence in later periods for the panel of countries investigated. The sign and size of the present and delayed FDI coefficients imply a net crowding out impact. The study's findings and analysis of the literature show that the continent need a tailored strategy to FDI, increased absorption capacity of local companies, and government-MNE cooperation to achieve mutual benefit.

Azomahou et al. (2005) used a panel of 100 nations to look at the empirical relationship between CO₂ emissions per capita and GDP per capita from 1960 to 1996. They discovered evidence of the relationship’s structural integrity. They then design a country-specific nonparametric panel data model. The findings of the estimation reveal that the connection is upward sloping.

Another concern in the literature is the conflicting findings on the relationship of FDI-energy power and FDI-pollution. For example, Eskeland and Harrison (2003) found that FDI helps Mexico save electricity. Cole and Elliott’s (2005) findings supported the carbon haven hypothesis for the aforementioned countries. Several studies, including Blackman and Wu (1999), Hübler and Keller (2010), Sadorsky (2010), and Herreries et al. (2013), have assumed that if FDI had contributed to energy production, per capita emissions would have decreased. Variations in processes, time intervals, or factors may have caused conflicting results in various experiments. As a consequence, the two lines of literature should be reviewed together in order to achieve reliable data. If there are contrary results, reducing emissions by energy savings enhanced by inward FDI cannot be obvious.

Muhammad and Khan (2019) contributed to factors that help Asian countries grow economically, with an emphasis on often-forgotten bilateral FDI, electricity use, CO₂ emissions, and a central position in the economy. In their study, they used the Generalized Approach of Moments (GMM), OLS regression, Fixed Effect and Random Effect Estimates. Between 2001 and 2012, data was gathered from 34 Asian host countries and 115 source countries. The study found that oil use, FDI inflows and outflows, CO₂ emissions, and other services all play a significant role in Asia’s economic growth. The current study shows that improved energy use strategies, such as the use of appropriate and innovative energy technologies, as well as attracting international investors both in and out of the countries, are being implemented in Asian countries, resulting in increased economic growth as the global economy grows due to both inflows and outflows of FDI, oil use, and CO₂ emissions.

Fauzel (2017) looked at the long- and short-term effects of FDI on CO₂ emissions in Mauritius (disaggregated into manufacturing and non-manufacturing sectors). In this study, the bounds checking approach to co-integration is used. For time series data from 1980 to 2012, the autoregressive distributed lag (ARDL) model is used. The study’s main findings show that foreign investment in the manufacturing industry is adverse to the environment, while FDI in non-manufacturing sectors is not. Furthermore, an increase in demand is thought to result in an increase in CO₂ emissions. Energy consumption in the world has already been found to result in an increase in CO₂ emissions. The results also affirm the stability of the model for the small island economy in Mauritius.

Saini and Sighania (2019) focused on long-term growth and carbon emissions, as well as their effect on the environment. They tried to gather all available information on the topic and discovered that, in the present scenario, the problem is gaining high priority due to the growing pace of development in developing countries. Many of the study supported Kuznets’ environmental curve theory, and they discovered a wide body of literature advocating for cleaner FDI as a way to reduce the negative environmental effects of economic growth.

Carbon pollution and foreign direct investment have a negative relationship, according to Yüksel et al. (2020). As a result, a comparison analysis is conducted for all E7 and G7 countries. The analysis framework incorporates Pedroni panel co-integration (PPC), Kao panel co-integration (KPC), and Dumitrescu Hurlin panel causality (DHPC) analyses. Gas emissions have a detrimental impact on foreign direct investment for all countries, according to the findings. This bond, on the other hand, is stronger
with the G7 economies. There is also no evidence of a causal relationship between these factors. Countries should follow ambitious policies to reduce carbon emissions, according to the experts. In this way, a new tax might be imposed on businesses that emit a lot of pollution. Policymakers, on the other hand, may be willing to support policies that aim to reduce carbon emissions. In this scenario, lowering the tax rate and increasing the supply of technical assistance are examples.

Li and Liu (2011) used absolute and comparative metrics representing the volume of CO₂ released from 30 Chinese provinces from 2000 to 2008 to divide the entire county into eastern and western regions based on economic and geographical factors. The thesis investigates the effect of foreign direct investment on CO₂ emissions across a technical channel. According to the findings, FDI’s effect on CO₂ emissions in China is erratic. FDI in the east has a significant positive impact on local CO₂ emissions; the role of FDI in the central region is unclear; and FDI in the west of the country had a negative impact on CO₂ emissions.

The effect of international trade and foreign direct investment (FDI) on CO₂ emissions in Turkey was investigated by Haug and Ucal (2019). They looked at both linear and non-linear ARDL models and discovered that exports, imports, and FDI have a significant asymmetrical effect on per capita CO₂ emissions. FDI, on the other hand, has no statistically significant long-term effects. The reduction in exports reduces per capita CO₂ emissions in the long run, but the increase in exports has no statistically meaningful effect. Imports increase CO₂ emissions per capita, while reductions in imports have no long-term effects. Exports and imports, on the other hand, have little effect on CO₂ power, which measures CO₂ emissions per unit of oil. Instead, financial development and urbanization are aided. They also discovered that the Kuznets environmental curve is current for both CO₂ indices, implying that increases in actual per capita GDP have led to lower CO₂ emissions for at least the last decade, after accounting for other competing causes. Furthermore, in two of the four markets, the sectoral share of CO₂ emissions in total CO₂ emissions asymmetrically changes with foreign trade, with export growth leading to a lower share of CO₂ and imports having the opposite impact. Fereidouni (2013) indicated that actual FDI states do not add to emissions of CO₂. Consumption of energy, urbanization and economic growth has also been described as significant determinants of CO₂ emissions.

Mugableh (2013) and Borhan et al. (2012) studied the association between CO₂ emissions and economic growth in Malaysia in separate ways, but the results were similar: an increase in the economy causes CO₂ emissions. To re-analyse CO₂ pollution, Mugableh (2013) used a self-regressive lag strategy. From 1971 to 2012, data was collected. The results show that economic development is dependent on energy demand, but that this can be harmful to the environment because it can result in CO₂ emissions.

Borhan et al. (2012) used FDI to conduct their research. From 1965 to 2010, they used a larger number of comments in the study. Revenue, FDI, population, exports and imports were included as parts of their CO₂ feature. The non-linear model has been used and the findings suggest that a rise in FDI implies a rise of CO₂ in the atmosphere. For 15 years, Maddison and Rehdanz (2008) looked at the relationship between GDP and carbon emissions in 134 countries (1990 to 2005). When variability is ignored, CO₂ emissions in North America, Asia, and Oceania are not compared to GDP. Han and Lee (2013) used a hierarchical panel data model to study the directional relationship between pollution and economic growth in OECD countries from 1981 to 2009. The connection between economic growth and pollution implies the need for technological advancement in order to achieve economic growth with minimal pollution, which supports Kuznets’ environmental curve hypothesis.

3. METHODS

A analysis using a composite model was carried out. Using STATA 15, describe the relationship between FDI and emission-related variables. The OLS (ordinary least squares) model was used. STATA 15 was used to describe the relationship between FDI and emission variables using the Pooled Ordinary Least Squares (POLS model). Using STATA 15, the Drisc/Kraay (DK) model was used to determine the relationship between FDI and emission variables. The two stage least square model (2SLS) was used to describe the relationship between FDI and variables related to emissions using STATA 15. Finally, using STATA 15, a Generalized Method of Moments (GMM) model was used to define important explanatory variables that can describe the reasons for the interaction between FDI and emission variables.

### Variables and Description

| Sl. No. | Variable | Description | Unit |
|---------|----------|-------------|------|
| 1       | lnFDI    | Log normal of Foreign direct investment, net inflows (BoP, current) (kt) |
| 2       | LnCO₂EKT | Log normal of CO₂ emissions | (kt) |
| 3       | LnCO₂EMTPC | Log normal of CO₂ emissions | (metric tons per capita) |
| 4       | LnCH₄ | Log normal of CH₄ emissions | (kt of CO₂ equivalent) |
| 5       | LnN₂O | Log normal of N₂O emissions | (thousand metric tons of CO₂ equivalent) |
| 6       | LnTGHGE | Log normal of Total greenhouse gas emissions | (kt of CO₂ equivalent) |

### Hypotheses

| No. | Hypotheses |
|-----|------------|
| H₁  | A significant positive relationship between FDI and CO₂ emissions (kt) of a country |
| H₂  | A significant positive relationship between FDI and CO₂ emissions (metric ton per capita) of a country |
| H₃  | A significant positive relationship between FDI and CH₄ emissions of a country |
| H₄  | A significant positive relationship between FDI and N₂O emissions |
| H₅  | A significant negative relationship between FDI and total greenhouse gas emissions |
4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The following table summarizes the informative data for all of the variables considered in this study’s models. For each element, the table shows the number of observations, mean value, standard deviations, minimum and maximum score.

Table 1 summarizes the data gathered over a 29-year period for 200 countries on six variables (Appendix 1). The major dependent variable, FDI, shows an average of 17.276 billion dollars for the countries surveyed, with a very high standard deviation of 7.291 billion dollars, indicating that there is a significant difference in FDI among the world’s countries. The average LnCO2_EKT is 7.598, while the average LnCO2_EMTPC is 0.554, according to the table. LnCO2_EKT and LnCO2_EMTPC have standard deviations of 4.163 and 1.557, respectively. The average LnCH4E, on the other hand, is 6.57, the average LnN2OE is 5.845, and the average LnTGHGE is 7.458. LnCH4E, LnN2OE, and LnTGHGE have standard deviations of 4.212, 4.007, and 5.122, respectively.

4.2. Pair Wise Correlation Matrix

First, we’ll look at the associations among the variables we found in the literature and see whether there’s a connection between FDI and different types of emissions. The variables are reported in a combined correlation matrix shown in Table 2.

Table 2 indicates that the factors have no correlation, suggesting that endogeneity is unlikely. Only the correlation coefficient matrices and collinearity test results are given due to the layout constraints. The findings, on the other hand, pass the correlation coefficient and VIFs tests. Furthermore, both of the variables display importance at the 0.10 mark. There is no correlation between any of the variables at the 0.90 mark.

4.3. Econometric Models

Multiple regression models have been run with the dependent (LnFDI) and independent variables (LnCO2_EKT, LnCO2_EMTPC, LnCH4E, LnN2OE and LnTGHGE). In the following section the results of those models are presented and interpreted below.

CO2 emissions (both kt and metric ton per capita) have a strong positive association with FDI, as seen in Table 3. The higher a country’s foreign direct investment, the higher its CO2 emissions. On the contrary CH4 emissions has significant negative relationship with the FDI which indicates that a country having high more FDI does not significantly affect the CH4 emission of a country. N2O emissions and total greenhouse gas emissions have a substantial positive relationship with FDI, indicating that more FDI produces more N2O and total greenhouse gas emissions in a region.

CO2 emissions (both kt and metric ton per capita) and nitrous oxide emissions (both kt and metric ton per capita) have a strong positive relationship with FDI, as seen in Table 4. The higher a country’s foreign direct investment, the higher its CO2 and N2O emissions. On the contrary methane emissions has significant negative relationship with the FDI which indicates that a country having high more FDI does not significantly affect the CH4 emission of a country. Total greenhouse gas emissions have a negative relationship with FDI, but the relationship is insignificant, even though the overall model is significant at the 10% stage.

CO2 emissions (kt) and nitrous oxide emissions (kt) have a significant beneficial association with FDI, as seen in Table 5. The higher a country’s foreign direct investment, the higher its CO2 and nitrous oxide emissions. Methane emissions, on the other hand, have a substantial negative association with FDI, indicating that a nation with a high level of FDI has no impact on its CH4 emissions. CO2 emissions (metric ton per capita and gross greenhouse gas emissions) have a favorable relationship with FDI, but the relationship is negligible, despite the overall model...
being important at the 10% stage. The next model is presented to improve the findings' robustness.

Table 4: Pooled ordinary least squares model

| LnFDI     | Coef. | St. Err. | t-value | P-value | 95% Conf | Interval | Sig |
|-----------|-------|----------|---------|---------|----------|----------|-----|
| LnCO\_EKT | 0.331 | 0.031    | 10.64   | 0       | 0.27     | 0.392    | *** |
| LnCO\_EMTPC | 0.817 | 0.112    | 7.29    | 0       | 0.598    | 1.037    | *** |
| LnCH\_E | −0.853 | 0.155    | −5.49   | 0       | −1.157   | −0.548   | *** |
| LnN\_OE | 0.622 | 0.16     | 3.89    | 0       | 0.308    | 0.936    | *** |
| LnTGHGE | −0.028 | 0.052    | −0.53   | 0.595   | −0.129   | 0.074    |     |
| Constant  | 16.48 | 0.305    | 54.06   | 0       | 15.883   | 17.078   | *** |

Mean dependent var | 17.276
Overall r-squared | 0.053
Chi-square | 282.463
R-squared within | 0.046

Table 5: Driscoll-Kraay pooled OLS model

Regression with Driscoll-Kraay standard errors
Method: Pooled OLS
Group variable (i): ID
Maximum lag: 3

| LnFDI     | Coef. | Std. Err. | T     | P>t   | 95% Conf | Interval |
|-----------|-------|-----------|-------|-------|----------|----------|
| LnCO\_EKT | 0.595 | 0.290     | 2.050 | 0.050 | 0.001    | 1.190    |
| LnCO\_EMTPC | 0.282 | 0.214     | 1.320 | 0.199 | −0.157   | 0.720    |
| LnCH\_E | −1.715 | 0.448     | −3.830 | 0.001 | −2.632   | −0.797   |
| LnN\_OE | 1.592 | 0.450     | 3.540 | 0.001 | 0.670    | 2.514    |
| LnTGHGE | 0.098 | 0.082     | 1.200 | 0.240 | −0.069   | 0.265    |
| _cons    | 13.825 | 2.583     | 5.350 | 0.000 | 8.534    | 19.117   |

Mean dependent var | 17.276
SD dependent var | 7.291
Number of obs=5800
Number of groups=200
Prob>F = 0.0000
R-squared=0.1273
Root MSE=6.8146

Table 6: Two stage least square model

Instrumental variables (2SLS) regression

| LnFDI     | Coef. | St. Err. | t-value | P-value | 95% Conf | Interval | Sig |
|-----------|-------|----------|---------|---------|----------|----------|-----|
| LnCO\_EKT | 0.331 | 0.031    | 10.64   | 0       | 0.27     | 0.392    | *** |
| LnCO\_EMTPC | 0.817 | 0.112    | 7.29    | 0       | 0.598    | 1.037    | *** |
| LnCH\_E | −0.853 | 0.155    | −5.49   | 0       | −1.157   | −0.548   | *** |
| LnN\_OE | 0.622 | 0.16     | 3.89    | 0       | 0.308    | 0.936    | *** |
| LnTGHGE | −0.028 | 0.052    | −0.53   | 0.595   | −0.129   | 0.074    |     |
| Constant  | 16.48 | 0.305    | 54.06   | 0       | 15.883   | 17.078   | *** |

Mean dependent var | 17.276
SD dependent var | 7.291
Number of obs=5800

Table 7: Generalized method of moments model

Regression results of system GMM model

| LnFDI     | Coef. | St.Err. | t-value | P-value | 95% Conf | Interval | Sig |
|-----------|-------|---------|---------|---------|----------|----------|-----|
| L.LnFDI | 0.2   | 0.019   | 10.50   | 0       | 0.163    | 0.237    | *** |
| LnCO\_EKT | 0.064 | 0.028   | 2.30    | 0.022   | 0.009    | 0.118    | **  |
| LnCO\_EMTPC | 0.969 | 0.182   | 5.34    | 0       | 0.613    | 1.326    | *** |
| LnCH\_E | 0.83  | 0.27    | 3.07    | 0.002   | 0.299    | 1.36     | *** |
| LnN\_OE | −1.1  | 0.3     | −3.67   | 0       | −1.689   | −0.512   | *** |
| LnTGHGE | 0.062 | 0.071   | −0.88   | 0.38    | −0.077   | 0.201    |     |
| Constant  | 13.47 | 0.366   | 36.85   | 0       | 12.753   | 14.186   | *** |

Mean dependent var | 17.438
SD dependent var | 7.187
Number of obs | 5400.000
Chi-square | 184.165

CO\_2 emissions (both kt and metric ton per capita) have a strong positive association with FDI, as seen in Table 6. The higher a
country’s foreign direct investment, the higher its CO₂ emissions. On the other hand, CH₄ emissions have a major negative association with FDI, indicating that a nation with a high level of FDI has no impact on its CH₄ emissions. N₂O emissions and total greenhouse gas emissions have a significant beneficial association with FDI, implying that more FDI causes more N₂O emissions and total greenhouse gas emissions. The next model is run to ensure that the findings are more reliable.

Table 7 reveals a significant positive association between CO₂ emissions (kt), CO₂ emissions (metric ton per capita), and CH₄ emissions and FDI. The higher a country’s foreign direct investment, the higher its CO₂ and methane emissions. In the other hand, N₂O emissions have a major negative association with FDI, indicating that a nation with a high level of FDI has no impact on its N₂O emissions. Total greenhouse gas emissions have a favorable relationship with FDI, but the relationship is negligible, despite the overall model being meaningful at the 10% stage.

5. CONCLUSION

To investigate the effects of foreign direct investment on CO₂, CH₄, N₂O and total greenhouse gas emission this study is conducted. Panel data for 200 countries over a period of 29 years (1990-2018) has been used as the sources of information. Ordinary Least Square (OLS), Pooled Ordinary Least Square (POLS), Driscoll-Kraay (DK), Second Stage Least square (2SLS), Generalized Methods of Moments (GMM) models have been performed and the result shows that there is a positive relationship between FDI and different types of green house gas emission. With economical advancement the emission green house gases (CO₂, CH₄, N₂O and others) increase simultaneously. The findings are very important in case of formulating environmental policies. Therefore, the developing country should find alternative sources of energy to ensure that there is no harmful effect on environment as there is an increase rate of energy consumption with economic growth. The use of natural gas, biomass, green technology etc. may be some important way to reduce CO₂ emission.

Data were collected only from 200 countries because there is a lack of data availability from remaining countries of the world. Data more than 29 years would have led us to a better conclusion. Data conversion during analysis may lead to some discrepancy. Besides these emissions many other variables remained untouched in this research that may help us on finding out other important determinants of FDI.

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APPENDIX

Appendix 1: List of countries

| 1   | Afghanistan        | 41 | Congo, Dem. Rep. | 81 | Hong Kong SAR, China |
| 2   | Albania            | 42 | Congo, Rep.      | 82 | Hungary              |
| 3   | Algeria            | 43 | Costa Rica       | 83 | Iceland              |
| 4   | American Samoa     | 44 | Cote d’Ivoire    | 84 | India                |
| 5   | Andorra            | 45 | Croatia          | 85 | Indonesia            |
| 6   | Angola             | 46 | Cuba             | 86 | Iran, Islamic Rep.   |
| 7   | Antigua and Barbuda| 47 | Cyprus           | 87 | Iraq                 |
| 8   | Argentina          | 48 | Czech Republic   | 88 | Ireland              |
| 9   | Armenia            | 49 | Denmark          | 89 | Isle of Man          |
| 10  | Aruba              | 50 | Djibouti         | 90 | Israel               |
| 11  | Australia          | 51 | Dominica         | 91 | Italy                |
| 12  | Austria            | 52 | Dominican Republic| 92 | Jamaica              |
| 13  | Azerbaijan         | 53 | Ecuador          | 93 | Japan                |
| 14  | Bahamas, The       | 54 | Egypt, Arab Rep. | 94 | Jordan               |
| 15  | Bahrain            | 55 | El Salvador      | 95 | Kazakhstan           |
| 16  | Bangladesh         | 56 | Equatorial Guinea| 96 | Kenya                |
| 17  | Barbados           | 57 | Eritrea          | 97 | Kiribati             |
| 18  | Belarus            | 58 | Estonia          | 98 | Korea, Dem. People’s Rep. |
| 19  | Belgium            | 59 | Eswatini         | 99 | Korea, Rep.          |
| 20  | Belize             | 60 | Ethiopia         | 100| Kosovo              |
| 21  | Benin              | 61 | Euro area        | 101| Kuwait               |
| 22  | Bermuda            | 62 | Fiji             | 102| Kyrgyz Republic      |
| 23  | Bhutan             | 63 | Finland          | 103| Lao PDR              |
| 24  | Bolivia            | 64 | France           | 104| Latvia               |
| 25  | Bosnia and Herzegovina| 65 | French Polynesia | 105| Lebanon              |
| 26  | Botswana           | 66 | Gabon            | 106| Lesotho              |
| 27  | Brazil             | 67 | Gambia, The      | 107| Liberia              |
| 28  | Brunei Darussalam  | 68 | Georgia          | 108| Libya                |

(Contd...)
Appendix 1: (Continued)

| Appendix Number | Country                  | Code | Country                  | Code |
|-----------------|--------------------------|------|--------------------------|------|
| 29              | Bulgaria                 | 69   | Germany                  | 109  |
| 30              | Burkina Faso             | 70   | Ghana                    | 110  |
| 31              | Burundi                  | 71   | Gibraltar                | 111  |
| 32              | Cabo Verde               | 72   | Greece                   | 112  |
| 33              | Cambodia                 | 73   | Greenland                | 113  |
| 34              | Cameroon                 | 74   | Grenada                  | 114  |
| 35              | Canada                   | 75   | Guatemala                | 115  |
| 36              | Chad                     | 76   | Guinea                   | 116  |
| 37              | Chile                    | 77   | Guinea-Bissau            | 117  |
| 38              | China                    | 78   | Guyana                   | 118  |
| 39              | Colombia                 | 79   | Haiti                    | 119  |
| 40              | Comoros                  | 80   | Honduras                 | 120  |
| 121             | Mauritius                | 161  | Singapore                |      |
| 122             | Mexico                   | 162  | Slovak Republic          |      |
| 123             | Micronesia, Fed. Sts.    | 163  | Slovenia                 |      |
| 124             | Moldova                  | 164  | Solomon Islands          |      |
| 125             | Mongolia                 | 165  | Somalia                  |      |
| 126             | Morocco                  | 166  | South Africa             |      |
| 127             | Mozambique               | 167  | South Asia               |      |
| 128             | Myanmar                  | 168  | Spain                    |      |
| 129             | Namibia                  | 169  | Sri Lanka                |      |
| 130             | Nauru                    | 170  | St. Kitts and Nevis      |      |
| 131             | Nepal                    | 171  | St. Lucia                |      |
| 132             | Netherlands              | 172  | St. Vincent and the Grenadines | |
| 133             | New Caledonia            | 173  | Sudan                    |      |
| 134             | New Zealand              | 174  | Suriname                 |      |
| 135             | Nicaragua                | 175  | Sweden                   |      |
| 136             | Niger                    | 176  | Switzerland              |      |
| 137             | Nigeria                  | 177  | Syrian Arab Republic     |      |
| 138             | North America            | 178  | Tajikistan               |      |
| 139             | North Macedonia          | 179  | Tanzania                 |      |
| 140             | Norway                   | 180  | Thailand                 |      |
| 141             | Oman                     | 181  | Timor-Leste              |      |
| 142             | Pakistan                 | 182  | Togo                     |      |
| 143             | Palau                    | 183  | Tonga                    |      |
| 144             | Panama                   | 184  | Trinidad and Tobago      |      |
| 145             | Papua New Guinea         | 185  | Tunisia                  |      |
| 146             | Paraguay                 | 186  | Turkey                   |      |
| 147             | Peru                     | 187  | Turkmenistan             |      |
| 148             | Philippines              | 188  | Uganda                   |      |
| 149             | Poland                   | 189  | Ukraine                  |      |
| 150             | Portugal                 | 190  | United Arab Emirates     |      |
| 151             | Qatar                    | 191  | United Kingdom           |      |
| 152             | Romania                  | 192  | United States            |      |
| 153             | Russian Federation       | 193  | Uruguay                  |      |
| 154             | Rwanda                   | 194  | Uzbekistan               |      |
| 155             | Samoa                    | 195  | Vanuatu                  |      |
| 156             | Sao Tome and Principe    | 196  | Venezuela, RB            |      |
| 157             | Saudi Arabia             | 197  | Vietnam                  |      |
| 158             | Senegal                  | 198  | Yemen, Rep.              |      |
| 159             | Seychelles               | 199  | Zambia                   |      |
| 160             | Sierra Leone             | 200  | Zimbabwe                 |      |