



FOREIGN AID AND HUMAN DEVELOPMENT: A QUANTILE REGRESSION APPROACH

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ABSTRACT

This paper investigates the impact of foreign aid on human development as measured by the human development index (HDI). We apply quantile regression approach for the data from 124 developing countries covering the period 1980 to 2013. The findings show that in general, aid is positively associated with the human development index. The impact is much greater in countries with low level of human development. Similarly, we find statistically positive impact of aid on HDI income, health, and education indices. The results imply that since aid is positively related with HDI, and HDI is universally accepted as a quantitative measure of human development, then aid can significantly contribute to promoting human welfare.

JEL Classification: O40, F21, F35

Key words: Foreign aid, Human development index, Quantile regression

1. INTRODUCTION

For a number of decades, foreign aid has been considered as an important tool rich countries can use for helping to promote better living condition in developing countries. It is argued that aid is an important tool in promoting growth, alleviating poverty, and improving welfare. The majority of studies have empirically examined the effectiveness of aid in promoting economic growth in recipient countries (e.g., Papanek, 1973; Boone, 1996; Burnside and Dollar, 2000; Gomanee, Girma and Morrissey, 2005; Burke and Ahmadi-Esfahani, 2006). However, limited work has been done to assess the effectiveness of aid in promoting human development in recipient countries. We believe that the utmost importance of foreign aid should be to improve the standard of living in recipient countries. Based on

this viewpoint, we are interested in exploring how lives are improved when foreign aid is received. We use the human development index (HDI) to capture the quality of human life in terms of life expectancy, education level and income level. These are the most important factors in determining the standard of living. Therefore, it is more important to consider HDI rather than just looking at economic growth in analyzing the effectiveness of foreign aid.

Aid can be linked with human development because of its role in supplementing the domestic resource gap thereby financing public investment in social services directly linked with life of the people. For instance, foreign aid can be used to finance investment in the education and health sector whereby more poor people will get access to education and health facilities, thus improving their living standards. This is important as it facilitates human capital accumulation and leads to income growth in the long run. As most developing countries face trade deficits as a consequence of foreign exchange reduction, foreign aid is expected to provide additional money that will supplement the foreign exchange gap and resolve the trade deficit problem. This facilitates technology transfer through capital goods imports which may result in higher productivity and income growth.

Past studies have produced mixed results on how aid is linked with human development. For example, Boone (1996) and Williamson (2008) reported aid as ineffective at increasing overall human health and hence is an unsuccessful human development tool. In contrast, Gomanee, Morrissey, Mosley, and Verschoor (2005) and Shirazi et al. (2009) found evidence supporting the positive effect of aid on human development. However, Gomanee et al. (2005) concluded that this evidence cannot be used to reach a conclusion on this issue as it was based on the data covering the period 1980 to 2000 while Shirazi et al. (2009) is based on time series analysis of Pakistani data only. In this study, we apply the quantile regression approach on the data from 124 developing countries, covering the period 1980 to 2013 (extended time period), to examine the impact of aid on human development. We take HDI as a measure of human development. We first estimate the results by using the overall HDI value, and then, disaggregate it into its three major dimensions, namely the income index, education index, and health index.

Our results indicate that, in general, foreign aid has positive impact on HDI and the impact is much greater in countries with low level of HDI. Furthermore, while the impact of aid on income and

health index is positive, no evidence has been found for any significant linkage between aid and the educational index.

The rest of the paper is organized as follows: the second section provides a brief review of literature on the aid-human development linkage; the third section describes the empirical methodology; and the fourth section discusses the empirical results. Finally, the paper provides concluding remarks of the study.

2. LITERATURE REVIEW

Majority of the aid literature has focused on the effectiveness of aid on growth rather than human development. This is because growth is assumed to be an important mechanism through which aid can help to achieve higher level of human development. Aid has direct impact on human development by improving the human development indicators such as those associated with income, health, and education. For instance, aid money can be used to finance projects and programs that can directly affect life. It can also be used to supplement the government budget in areas that directly benefit the people.

Meanwhile, only few studies have investigated the impact of aid on human development. Yet these studies are inconclusive. For example, Boone (1996) who pioneered in conducting study in this area found no significant relationship between aid and infant mortality rates as one of the indicators of human development. Boone's model, however, did not control for the influence of government spending on human development. Following the Boone study, most of the studies conducted in this area achieved results contrary to Boone's findings. These studies suggested existence of positive relationship between aid and welfare improvement. For instance, Mosley and Hudson (2001) and Kalwij and Verschoor (2002) indicate that aid has an impact on poverty reduction as well as indirect impact on well-being through pro-poor expenditure of recipient countries' government. Similarly, Gomanee et al. (2005) investigated the effect of aid on government expenditure and aggregate human development welfare measured by infant mortality rate and HDI for data from 38 countries (starting from 1980 to 1998). The results suggested that aid improved human development of recipient countries with much greater impact in low-income countries. These findings were in line with Kalwij and Verschoor (2002) and Mosley et al. (2004) who undertook the cross-country analysis and found a direct relationship between aid and welfare improvement in developing countries. Furthermore, Feeny (2003) found evidence suggesting that sectoral allocation of aid is

consistent with poverty reduction strategy and welfare improvement. He proposed aid allocation to regions with large proportion of poor people (such as rural areas) and to the sectors that will benefit the poor. Moreover, Hassan (2000) reported declining relationship between HDI and GDP at higher income levels. He argued that improvement in HDI tends to lag behind income growth, and the rise in military expenditure works against the human resource development.

Human development is often described as closely related with economic growth of the country. Scholars generally agree that these two variables are linked and that growth is a pre-requisite for any poverty reduction welfare promotion strategy (Dollar and Kraay, 2002; Moster and Ichida, 2001; Gallup, Sachs, and Mellinger, 1999). The degree of their association has meant that most aid-welfare analyses are conducted based on aid impact on growth. Dollar and Kraay (2002) suggested that the average per capita income is proportionately related with increase in per capita income of the poor. Therefore, any effective poverty reduction strategy should be targeted at increasing the share of income of the poorest quartile of the population. Likewise, Kraay (2004) found evidence supporting the Dollar and Kraay (2002) findings. He examined the association between absolute poverty measures and income growth and found that income growth is negatively related with absolute poverty measures. All this evidence supports the notion that for aid to have impact on human welfare, it must have positive impact on income growth.

Bahmani-Oskooee and Oyolola (2009) investigated the impact of aid on aggregate welfare by using a cross-country regression based on pooled time series analysis. The results supported the hypothesis that foreign aid is effective in increasing aggregate welfare by the reducing the poverty rates of recipient countries. Some studies also indicate that aid effectiveness on welfare requires optimal allocation aid in different sectors of the economy. Le and Winters (2001) stressed that for aid effectiveness on poverty and welfare, it should be optimally allocated in the mix of three major areas, namely economic growth, direct target to the poor, and direct transfer and provision of safety net. However, the optimal aid mix depends on certain factors in the recipient country including geographic distribution and sectoral composition.

Duncan (2001) argues that although good governance is very important for healthy development of both private and public sector which in turn promotes growth, projects in this sector have more effect in enhancing income growth and welfare in the urban compared to rural areas. Therefore, he suggested that, for reducing poverty, foreign

aid should be allocated to rural areas in projects such as improving roads, education and health care facilities rather than public sector reform. Another strand of studies argues that human development is significantly associated with trade flows. For instance, Hamid and Amin (2013) present evidence for the existence positive effect of trade on human development (measured by HDI) through income channels only (without affecting other components of HDI). The study was based on GMM analysis of data from OIC countries from 1980 to 2005.

3. METHODOLOGY

3.1 MODEL SPECIFICATION

We adopt the Gomanee et al. (2005) welfare model to estimate the impact of aid, government expenditure, and aggregate welfare on human development. In our model, we do some modifications by adding the measure of population growth. We believe that population growth affects aggregate development by imposing extra cost of social services necessary to improve human living condition. Thus, we specify our model as follows:

$$(1) \quad W_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 GOV_{it} + \beta_3 GDP_{it} + \beta_4 POP_{it} + \varepsilon_{it}$$

where W is the country's level of human development measured by HDI, AID is foreign aid measured by net flow of official development assistance (ODA) divided by GDP, GOV is the proportion of government spending not financed by aid as a percentage of GDP, GDP is the rate of economic growth measured by GDP growth rate, and POP is the country's population growth rate measured by percentage increase in total number of people for each country. The β 's are the slope coefficients and ε represents the stochastic error terms, which is assumed to fulfill all classical assumptions. The i represents the observations of all members of the panel at time t .

3.2 QUANTILE REGRESSION APPROACH

We apply the quantile regression approach proposed by Koenker and Basset (1978) and Koenker (2005) to study the impact of foreign aid on welfare measures in 124 developing countries. The method is appropriate for this analysis as it allows us to examine the effect of aid at different levels of countries' welfare. The choice of this method was based on the hypothesis that effectiveness of aid may be different at

different levels of human welfare. The method is particularly useful for this study because it includes a set of heterogeneous countries with different characteristics such that the conditional distribution does not have standard shape such as an asymmetric, fat-tailed, or truncated distribution.

To understand the mechanics of the quantile regression model, let us consider the following linear form of the conditional quantile function:

$$(2) \quad qy_i(\tau|X = x) = x'\beta$$

where y is the dependent variable, x represents the vector of independent variables, τ is the quantile and β is the set of parameters to be estimated. The quantile regression model is intended to minimize the following weighted average through:

$$(3) \quad \hat{y}_{Quantile} = \min \sum_{i=1}^n \rho_{\tau}(y_i - x'_i\beta)$$

In (3), the conditional distribution of dependent variable y_i has different value at different quantile (i.e. at τ^{th} quantile) given the value covariates x (Koenker, 2005), while the ρ_{τ} is the weighting factor which is known as check function. At any point where $\tau \in (0,1)$, check function is described as:

$$(4) \quad \rho_{\tau}(\mu_i) = \begin{cases} \tau\mu_i & \text{if } \mu_i \geq 0 \\ (\tau - 1)\mu_i & \text{if } \mu_i < 0 \end{cases}$$

where $\mu_i = y_i - x'_i\beta$. Thus, from (3) and (4) above, it is clear that Koenker and Basset's (1978) quantile regression model intends to minimize the following optimization function:

$$(5) \quad \hat{\beta}_{\tau} = \min_{\beta \in R^k} \left[\sum_{i \in \{y_i \geq x'_i\beta\}} \tau|y_i - x'_i\beta| + \sum_{i \in \{y_i < x'_i\beta\}} (1 - \tau)|y_i - x'_i\beta| \right]$$

The minimization function presented in (5) implies that the quantile regression parameters can be computed by minimizing the sum of absolute errors of the model and their weights depend on specific quantile values.

In order to conduct parameter tests, we employ bootstrap method to generate robust standard errors (Buchinsky, 1998). This method is appropriate because it allows us to deal with joint distribution of several quantile regression estimators by which the test of quantile slope equality can be performed (Koenker and Hallock, 2001). It also performs well especially in relatively small samples and the results remain valid under various heterogeneity forms. In every case, we perform 10,000 bootstrapping repetitions to assure robustness of our results. We also conduct the quantile slope equality test to determine whether it is necessary to use quantile regression approach in our study. The test is performed under the null hypothesis that the inter-quantile slope coefficients are equal. If Chi square statistic fails to reject this hypothesis, then the quantile regression should not be used for analysis.

3.3 DATA DESCRIPTION

The study involves the analysis of data from 124 developing countries from 1980 to 2013. Five-year average data were taken which lead to formulation of unbalanced panel with minimum and maximum of three and seven observations (for each country), respectively. The five years average computations were considered to take into account the data gaps which were observed in some countries especially developing countries where it is difficult to find annual data for some variables such as HDI. Unbalanced panels for randomly missing observation are adopted in Baltagi (1985), Fuller and Battese (1974) and Wansbeek and Kapteyn (1989). Baltagi and Chang (1994) stated that it is most efficient to use the unbalanced dataset instead of ensuring balance by cutting off excess data. Human development is measured by using the human development index (HDI).

HDI represents a composite index which measures the average achievement in three basic dimensions of human development: a long and healthy life, knowledge, and a decent standard of living. The index ranges between 0 and 1 by which the country with higher HDI value has higher level of human development and vice versa. The data for HDI was taken from the World Bank online database. Foreign aid is measured by the ratio of net official ODA to country's GDP while economic growth and population growth are measured by the percentage change in the country's GDP and population, respectively. Like the model employed by Gomanee et al. (2005), per capita GDP is included in the model to control for initial income per capita. The model controls for the effect of GDP on

HDI since any aid disbursement could increase GDP in the current time period as an increase in per capita income directly increases human development. The measures of these variables were gathered from the UNCTAD online statistical database. Government expenditure is measured by percentage of government spending without foreign financing to country's GDP and their data were taken from World Development Indicators. We specify REGION, a set of three dummies that indicate whether the country was located in Africa, Asia or Latin America and the Caribbean because these three geographical regions highly receive huge amount of aid but have different levels of human development. Thus, regional dummies are included to account for potential regional differences.

4. EMPIRICAL RESULTS

Table 1 presents the quantile regression results for effect of aid on overall HDI value at five different percentiles of aggregate welfare (namely 10th, 25th, 50th, 75th, and 90th). In all regressions, we used the

TABLE 1
Quantile Regression Results: Overall HDI Value

Variable	$\tau = 10$	$\tau = 25$	$\tau = 50$	$\tau = 75$	$\tau = 90$
<i>Log Aid</i> _{<i>t-1</i>}	0.0532** (0.041)	0.0431*** (0.024)	0.0309** (0.029)	0.0315** (0.020)	0.010 (0.030)
<i>Log GDP</i> _{<i>t-1</i>}	0.178** (0.094)	0.104*** (0.036)	0.231*** (0.038)	0.170*** (0.029)	0.177*** (0.013)
<i>Log Gov</i> _{<i>t-1</i>}	0.015 (0.006)	0.002 (0.005)	0.003 (0.005)	0.002 (0.004)	-0.007 (0.013)
<i>Log Pop</i> _{<i>t-1</i>}	0.043 (0.070)	0.0498** (0.029)	0.0387** (0.020)	0.040** (0.032)	0.0310 (0.033)
<i>AFRICA</i>	-0.019 (0.024)	-0.011 (0.021)	-0.012 (0.005)	-0.007 (0.017)	0.004 (0.016)
<i>ASIA</i>	0.043** (0.005)	0.034*** (0.031)	0.033*** (0.012)	0.042*** (0.011)	0.040** (0.021)
<i>LAC</i>	0.026 (0.020)	0.029** (0.005)	0.015 (0.003)	0.002 (0.018)	-0.004 (0.021)
Constant	-2.110 (1.016)	-1.604*** (0.094)	-0.805*** (0.275)	-1.103** (0.460)	-0.434* (0.669)
Pseudo R-squared	0.055	0.051	0.061	0.022	0.004

Note: Dependent variable is overall HDI value. The asterisks ***, **, and * are 1%, 5%, and 10% of significance levels, respectively. The numbers in parentheses are heteroskedasticity-robust standard errors. Quantile regression results are based on 10,000 bootstrapping repetitions.

lagged values of all explanatory variables to account for the potential endogeneity (Gomanee et al., 2005). It is also assumed that the impact of any macroeconomic intervention on human development takes long time to be realized. Hence, five years lag is assumed to be a reasonable time period for the impact to be apprehended. The results have passed the quantile slope equality test by which the null hypothesis of equal slope coefficients across different quantiles is rejected. It can be observed from the results that per GDP growth has significant positive impact on overall HDI at all quantiles, consistent with our expectations and economic intuitions. The size of its coefficients varies across different quantiles. Likewise, inconsistent to theoretical expectations, population growth has positive coefficient. The coefficient is statistically significant at the 5 percent level except for the 10th and 90th percentiles. Government spending (without foreign financing) has statistically significant positive coefficient at all quantiles.

Foreign aid has positive effect on overall HDI. The impact is statistically significant at the 25th, 50th, and 75th quantiles. The impact declines at upper quantiles. The results are consistent with the hypothesis that aid is associated with human development

TABLE 2
Quantile Regression Results: HDI Income Index

Variable	$\tau = 10$	$\tau = 25$	$\tau = 50$	$\tau = 75$	$\tau = 90$
<i>Log Aid_{t-1}</i>	0.0316** (0.100)	0.0650*** (0.002)	0.0411** (0.020)	0.0340* (1.412)	0.0331** (1.975)
<i>Log Gov_{t-1}</i>	0.018** (0.025)	0.024** (0.027)	0.052* (0.029)	0.007* (0.041)	-0.019 (0.583)
<i>Log Pop_{t-1}</i>	0.016 (0.143)	0.0308** (0.104)	0.064** (0.126)	0.057* (1.544)	0.059** (1.859)
<i>AFRICA</i>	-0.005 (0.015)	-0.023 (0.011)	-0.021 (0.004)	-0.011 (1.211)	0.010 (0.155)
<i>ASIA</i>	0.003** (0.006)	0.013*** (0.009)	0.060*** (0.019)	0.062*** (2.217)	0.076*** (3.206)
<i>LAC</i>	0.0215 (0.010)	0.0347** (0.005)	0.020 (0.008)	0.013 (0.720)	0.022* (1.990)
Constant	-1.115 (1.058)	-1.297*** (0.440)	-1.282*** (0.467)	-0.897*** (1.144)	-0.989*** (1.018)
Pseudo R-squared	0.660	0.679	0.699	0.701	0.675

Note: Dependent variable is income index of HDI. The asterisks ***, **, and * are 1%, 5%, and 10% of significance levels, respectively. The numbers in parentheses are heteroskedasticity-robust standard errors. Quantile regression results are based on 10,000 bootstrapping repetitions.

improvement. However, effectiveness of aid on human development varies across different countries. Our results are consistent with Gomanee et al. (2005) who employed the same estimation approach for the data from 104 developing countries from 1980 to 2000. The findings are also consistent with Shirazi et al. (2009) who applied the vector error correction model on time series data for Pakistan and concluded that foreign aid flow is positively associated with higher level of human development. The implication of our results is that foreign aid can be used as a powerful tool for promoting human development.

Table 2 presents the quantile regression estimates for effect of foreign aid on income index as a component of HDI. Because income determines the human livelihood and standard of living, we estimated this model to examine how much foreign aid affects the standard of living in sampled countries. The results reveal that foreign aid generally has positive effect on income of the people. The effect is statistically significant in all quantiles. The results support the Dollar and Kraay (2002) view that aid has proportionate effect on the income

TABLE 3
Quantile Regression Results: HDI Education Index

Variable	$\tau = 10$	$\tau = 25$	$\tau = 50$	$\tau = 75$	$\tau = 90$
<i>Log Aid</i> _{<i>t-1</i>}	0.193** (0.054)	0.170** (0.057)	0.054** (0.046)	0.016* (0.030)	0.013* (0.022)
<i>Log GDP</i> _{<i>t-1</i>}	0.073 (0.024)	0.053 (0.045)	0.130 (0.670)	0.1546** (0.051)	0.187** (0.038)
<i>Log Gov</i> _{<i>t-1</i>}	0.017 (0.005)	0.050** (0.008)	0.051 (0.680)	0.010 (0.154)	0.015** (0.167)
<i>Log Pop</i> _{<i>t-1</i>}	0.075 (0.009)	-0.056 (0.005)	-0.004 (0.004)	0.009 (0.022)	-0.019 (0.031)
<i>AFRICA</i>	-0.165*** (0.029)	-0.197** (0.123)	-0.123*** (2.322)	-0.137*** (0.043)	-0.162*** (0.034)
<i>ASIA</i>	-0.165*** (0.078)	-0.214*** (0.086)	-0.349*** (-2.604)	-0.290*** (0.019)	-0.180 (0.065)
<i>LAC</i>	-0.035 (0.006)	-0.226** (0.008)	-0.108** (1.107)	-0.127*** (0.015)	-0.109*** (0.041)
Constant	-0.334 (0.205)	0.102* (0.667)	0.006 (0.584)	-0.553 (0.505)	0.343 (0.650)
Pseudo <i>R</i> -squared	0.249	0.280	0.286	0.279	0.299

Notes: Dependent variable is HDI education index. The asterisks ***, **, and * are 1%, 5%, and 10% of significance levels, respectively. The numbers in parentheses are heteroskedasticity-robust standard errors. Quantile regression results are based on 10,000 bootstrapping repetitions.

of the poor at lower quantiles. Thus, aid should be targeted at increasing the share of income of the poorest quantiles of the population to enhance human development.

In Table 3, we present the regression estimates of the effect of aid on the education index of HDI. As can be observed from Table 3, the results reveal that in all quantiles, the null hypothesis that foreign aid has an impact on educational achievement (HDI value in education) is statistically insignificant and thus it is rejected. Although the coefficients of lagged aid are statistically significant at different levels of significance, their magnitudes decline as we move from lower to higher quantiles. This suggests that, generally, aid is more helpful in countries with low educational achievements. Education achievement is a very important aspect of human development as it affects other aspects of human development such as health and income earning. Thus, we suggest that aid should be appropriately and sufficiently allocated to sectors that will influence better educational achievement.

TABLE 4
Quantile Regression Results: HDI Health Index

Variable	$\tau = 10$	$\tau = 25$	$\tau = 50$	$\tau = 75$	$\tau = 90$
<i>Log Aid_{t-1}</i>	0.175 (0.157)	0.186 (0.168)	0.738*** (0.059)	0.902** (0.045)	0.190 (0.048)
<i>Log GDP_{t-1}</i>	0.131** (0.018)	0.118*** (0.036)	0.110** (0.038)	0.125*** (0.066)	0.137*** (0.059)
<i>Log Gov_{t-1}</i>	0.028 (0.038)	0.013 (0.025)	0.012 (0.014)	0.014 (0.012)	0.003 (0.010)
<i>Log Pop_{t-1}</i>	0.032 (0.022)	0.035 (0.020)	0.044* (0.030)	0.054 (0.040)	0.056 (0.041)
<i>AFRICA</i>	-0.313** (0.113)	-0.355*** (0.122)	-0.288*** (0.024)	-0.234*** (0.020)	-0.045*** (0.055)
<i>ASIA</i>	-0.002 (0.100)	-0.011 (0.012)	-0.045 (0.034)	0.044 (0.033)	0.025 (0.035)
<i>LAC</i>	0.039 (0.088)	-0.014 (0.057)	-0.020 (0.029)	-0.031 (0.030)	-0.022 (0.011)
Constant	-0.300 (0.402)	-0.315 (0.488)	-0.402 (0.532)	-0.562 (0.617)	-0.701 (0.745)
Pseudo R-squared	0.517	0.569	0.507	0.440	0.411

Note: Dependent variable is HDI health index. The asterisks ***, **, and * are 1%, 5%, and 10% of significance levels, respectively. The numbers in parentheses are heteroskedasticity-robust standard errors. Quantile regression results are based on 10,000 bootstrapping repetitions.

Table 4 reports the quantile regression estimates on the effect of foreign aid on human development in terms of health achievement measured by HDI value in health. The results suggest that generally, aid has positive impact on health achievement in sample countries. The coefficient is statistically significant at median regression (50th quantile) and 75th quantile only. Its size changes across different quantiles and is significantly bigger in these two quantiles. These results are consistent with Gomanee et al. (2005) who found evidence from 104 developing countries that foreign aid is associated with lower infant mortality rates. The significant aid coefficients confirm that foreign aid can be used as a tool for achieving the health related sustainable development goals (SDGs) in developing countries. In contrast, our results oppose Boone (1996) who failed to find any significant association between foreign aid and infant mortality rate.

5. CONCLUSION

In this study, we examine the effect of foreign aid on human development as measured by the human development index (HDI). We apply quantile regression approach for the five years averaged data from 124 developing countries covering the period 1980 to 2013. We first estimate the effect of aid on human development using the overall HDI value. Then, we estimate the effect on three aspects of HDI, namely income, education, and health indices. Our results indicate that generally aid improves the human development level in sample countries. The impact is greater in countries with low level of human development. Our results are consistent with Gomanee et al. (2005) who applied the same estimation method but with small sample (only 38 countries) and arrived at a similar conclusion. More specifically, the results suggest that aid is positively associated with increase in the income, health and education indices of HDI. The effect of aid on overall level of human development is much greater at quantiles below the median (25th). Our results are consistent with Gomanee et al. (2005) but inconsistent with Boone (1996) who found statistically insignificant relationship between aid and health achievement measured by infant mortality rate. The implication of our results is that foreign aid can be used as an important tool for promoting human development in developing countries, especially in the poorest countries. We suggest that aid should be appropriately allocated to sectors that promote human development in order to realize the desired results.

REFERENCES

- Bahmani-Oskooee, M., and M. Oyolola. "Poverty Reduction and Aid: Cross-Country Evidence. *International Journal of Sociology and Social Policy* 29, no. 5 (2009): 264-73.
- Baltagi, B.H. "Pooling Cross-Sections with Unequal Time-Series Lengths." *Economics Letters* 18 (1985): 133-6.
- Baltagi, B.H., and Y. Chang. "Incomplete Panels: A Comparative Study of Alternative Estimators for the Unbalanced One Way Error Component Regression Model." *Journal of Econometrics* 62, no. 2 (1994): 67-89.
- Boone, P. (1996). "Politics and the Effectiveness of Foreign Aid." *European Economic Review* 40, no. 2 (1996): 289-329.
- Buchinsky, M. "Recent Advances in Quantile Regression Models: A Practical Guideline for Empirical Research." *Journal of Human Resources* 33 (1998): 88-126.
- Burke, P.J., and F.Z. Ahmadi-Esfahani. "Aid and Growth: A Study of South East Asia." *Journal of Asian Economics* 17, no. 2 (2006): 350-62.
- Burnside, C., and D. Dollar. "Aid, Policies and Growth." *American Economic Review* 90, no. 4 (2000): 847-68.
- Dollar, D., and A. Kraay. "Growth is Good for the Poor." *Journal of Economic Growth* 7 (2002): 195-225.
- Duncan, R.C. "Papua New Guinea: Poverty Analysis, Poverty Reduction and the Appropriateness of AusAID's Development Assistance." National Centre for Development Studies, Australian National University, 2001.
- Feeny, S. "The Impact of Foreign Aid on Poverty and Human Well-Being in Papua New Guinea." *Asia-Pacific Development Journal* 10, no. 2 (2003): 73-86.
- Fuller, W.A., and G.E. Battese. "Estimation of Linear Models with Cross-Error Structure." *Journal of Econometrics* 2 (1974): 67-78.
- Gallup, J.K., D. Sachs, and A. Mellinger. "Geography and Economic Development." *International Regional Science Review* 22, no. 2 (1999): 179-232.
- Gomanee, K., S. Girma, and O. Morrissey. "Aid and Growth in Sub-Saharan Africa: Accounting for Transmission Mechanisms." *Journal of International Development* 17, no. 8 (2005): 1055-75.

- Gomanee, K., O. Morrissey, P. Mosley, and A. Verschoor. "Aid, Government Expenditure, and Aggregate Welfare." *World Development* 33, no. 3 (2005): 355-70.
- Hamid, Zarinah, and Ruzita Mohd Amin. "Trade and Human Development in OIC Countries: A Panel Data Analysis." *Islamic Economics Studies* 21, no. 2 (2013): 55-70.
- Hasan, Zubair. "Determinants of Human Resource Development: An Empirical Analysis." *IJUM Journal of Economics and Management* 8, no. 2 (2000): 157-87.
- Kalwij A., and A. Verschoor. "Aid, Social Policy and Pro-Poor Growth." *Occasional Paper* 4, Research Programme on Risk, Labour Markets and Pro-Poor Growth, Department of Economics, University of Sheffield, 2002.
- Koenker, R., and G. Bassett, Jr. "Regression Quantiles." *Econometrica*, 46 (1978): 33-50.
- Koenker, R., and K.F. Hallock. "Quantile Regression." *Journal of Economic Perspective* 15, no. 4 (2001): 143-56.
- Koenker, R. *Quantile Regression*. Cambridge, UK: Cambridge University Press, 2005.
- Kraay, A. "When is Growth Pro-Poor? Evidence from a Panel of Countries." *Journal of Development Economics* 80, no. 1 (June 2004): 198-227.
- Le, T.H., and P. Winters. "Aid Policies and Poverty Alleviation: The Case of Vietnam." *Asia-Pacific Development Journal* 8, no. 2 (2001): 27-44.
- Mosley, P., and J. Hudson. *Aid, Poverty Reduction and the New Conditionality*. OECD International Development Statistics CD Rom, Paris, 2001.
- Mosley, P., J. Hudson, and A. Verschoor. "Aid, Poverty Reduction and the New Conditionality." *The Economic Journal* 114, no. 496 (2004): 217-43.
- Moster, I., and T. Ichida. "Economic Growth and Poverty Reduction in Sub-Saharan Africa." *IMF Working Paper* WP/01/112 (2001), International Monetary Fund.
- Papanek, G. "Aid, Private Foreign Investment, Savings and Growth in Less Developed Countries." *Journal of Political Economy* 81 (1973): 120-30.
- Ravallion, M., and C. Shaohua. "What Can New Survey Data Tell Us About Recent Changes in Distribution and Poverty?" *The World Bank Economic Review* 11, no. 2 (1997): 357-82.
- Shirazi, Nasim Shah, Turkhan Ali Abdul Mannap, and Muhammad Ali. "Effectiveness of Foreign Aid and Human

Development.” *The Pakistan Development Review* 48, no. 4 (2009): 853-62.

Wansbeek, T.J., and A. Kapteyn. “Estimation of the Error Components Model with Incomplete Panels.” *Journal of Econometrics* 41 (1989): 341-61.

Williamson, Claudia R. “Foreign Aid and Human Development: The Impact of Foreign Aid to the Health Sector.” *Southern Economic Journal* 75, no. 1 (2008): 188-207.

APPENDIX

List of Sample Countries in Alphabetical Order

African Countries

Algeria, Angola, Belize, Benin, Botswana, , Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe

Asian Countries

Afghanistan, Azerbaijan, Bangladesh, Bhutan, India, Iran, Jordan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Myanmar, Nepal, Oman, Maldives, Malaysia, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam, Yemen

Latin American and Caribbean Countries

Antigua and Barbuda, Bolivia, Argentina, Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Georgia, Grenada, Guatemala, Guyana, Jamaica, Haiti, Honduras, Mexico, Nicaragua, Paraguay, Panama, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela

European Countries

Albania, Armenia, Bosnia and Herzegovina, Croatia, Cyprus, Malta

Oceania

Fiji, Kiribati, Micronesia, Palau, Solomon Islands, Samoa, Tonga, Vanuatu
