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The Impact of Foreign Aid's 7 Functional Categories on Economic Development in Recipient Countries*

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There are 3 major views on the effectiveness of foreign aid. First, foreign aid is perceived as positive in terms of its effect on growth. Second, foreign aid is effective when certain conditions (e.g. political conditions) are satisfied. Third, aid has neither significant impact nor has it positive returns on economic growth. A substantial part of foreign aid research has been focused on total amount of aid's effects on economic growth. To clarify all these issues, 7 major functional types of aid are examined (e.g. social services and infrastructure). From the methodology perspective, we use panel data techniques such as the fixed effects, random effects and system GMM. For describing economic development, we use the proxies of 'PQLI (Physical Quality of Life Index),' HDI (Human Development Index), infant mortality rate, age dependency ratio, adult literacy rate, as well as GDP growth, and others. All these variables are used as dependent variables to judge aid's effectiveness. Concerning the independent variables, we use a variety of them as per literature and the 7 categories of aid. As a result of this analysis all categories of aid affect our dependent variables in different ways. Two important consequences can be drawn from our study. First, our paper confirms the positive impact of foreign aid on economic development as many other researchers have been pointed and contrary to those who have suggested a negative impact of foreign aid. And second, both recipient and donor countries can see the significance and impact of different categories of aid more precisely.

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1. INTRODUCTION AND BACKGROUND

There has been a worldwide long-cherished desire to banish poverty. Almost three billion people live on less than two dollars a day, adjusted for purchasing power.[1] One billion people in the world lack access to clean water; two billion lack access to sanitation. One billion adults are illiterate. About a quarter of the children in the poor countries do not finish primary school (Easterly, 2006). Efforts to reduce extreme poverty are carried out through the MDGs (Millennium Development Goals),[2] which are the most broadly supported, comprehensive and specific development goals the world has ever agreed upon. The MDGs-related eight time-bound goals provide concrete, numerical benchmarks for tackling extreme poverty in its many dimensions.

They include goals and targets on income poverty, hunger, maternal and child mortality, disease, inadequate shelter, gender inequality, environmental degradation and the global partnership for development. These goals are agreed by all United Nations members and at least 23 international organizations. As part of achievement of these goals, the Development Assistance Committee (DAC)[3] intensifies efforts by providing foreign aid to

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[1] The World Bank defines extreme poverty as living on less than US$1.25 per day (PPP), and moderate poverty as less than $2 a day. It has been estimated that in 2008, 1.4 billion people had consumption levels below US$1.25 a day and 2.7 billion lived on less than $2 a day (US Department of Health and Human Services website).

[2] Adopted by world leaders in the year 2000 and set to be achieved by 2015, the MDGs are both global and local, tailored by each country to suit specific development needs. They provide a framework for the entire international community to work together towards a common end-making sure that human development reaches everyone, everywhere.

[3] "The Development Assistance Committee (DAC) is a unique international forum where donor governments and multilateral organizations-such as the World Bank and the United Nations-come together to help partner countries reduce poverty and achieve the Millennium Development Goals. This means seeking new ways of working to increase not only the

developing countries. Korea also has been a member of this Committee since January 2010. In 1970, the UN General Assembly made a commitment to confer 0.7% of advanced countries' GNI (Gross National Income) as Official Development Assistance (ODA)[4] to developing countries by 2015. However, this target of 0.7% has not been reached by many OECD countries. There are some doubts cast and hence many debates on aid effectiveness promoting growth.

Therefore, this paper attempts to assist in a more precise manner the donor countries of Foreign Aid (FA) by analyzing individual types of FA's impact on recipient countries' quality of life and economic growth. Consequently, donor countries might be able to know how to provide their aid to recipient countries in order to achieve maximum effect. Also, recipient countries might be able to acquire the correct type of FA and hence to be able to build their own capacity to accomplish solid development. There is a substantial number of researches on the relationship between FA and economic growth. Results vary according to countries included, estimation method, control variables, etc. We can group these results into three different categories according to supporting articles.

First, foreign aid is perceived as positive in terms of its effect on growth (Economides *et al*., 2008). Findings of Dalgaard *et al*. (2004) are also consistent with this perspective. Gounder (2001) finds that total FA flows and FA's various forms, i.e. bilateral aid, grant aid and technical cooperation, have a significant impact on economic growth in Fiji. Hansen and Tarp (2000) suggest that FA works even in countries hampered by an unfavorable policy environment. Karras (2006) shows that the effect of FA on economic growth is positive, permanent, statistically significant, and sizable. A study of Fayissa and ElKaissy (1999) shows that FA has a statistically

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quantity of aid but also to improve aid effectiveness" (OECD, 2010).

4) Official development assistance (ODA) is official financing flows administered for the promotion of economic development and welfare of developing countries. By convention, ODA flows comprise contributions of individual donor government agencies and multilateral institutions to developing countries ("bilateral ODA" and "multilateral ODA" respectively). ODA receipts comprise disbursements by bilateral donors and multilateral institutions (OECD Glossary of Statistical Terms).

positive effect on economic growth in developing countries. Gyimah-Brempong (1992) indicates that FA has a small but positive and significant effect on economic growth in Sub-Saharan Africa.

Second, conditional effectiveness of FA has been emerging among investigators to play a significant role in relevant research. Alvi *et al*. (2008b) found that political conditions are an important determinant of growth and some evidence is provided of FA's diminishing returns at very high levels of FA. Chauvet and Guillaumont (2004) argue that FA may influence polity; economic vulnerability to external shocks is a factor that enhances the effectiveness of FA (which is higher in more vulnerable economies); political instability lowers the effectiveness of FA; and absorptive capacity may also improve the effectiveness of aid. Dovern and Nunnenkamp (2007) indicate that FA flows have a small but significantly positive effect on growth acceleration.

Guillaumont and Chauvet (2001) examine two aspects of FA: effectiveness and allocation. They first suggest that FA is only effective if domestic policies are appropriate. Secondly, in contrast, FA effectiveness depends on the external and climatic environment. Islam (2003) states that on average, FA is found to have a significant negative impact on growth in developing countries depending on political regimes. Durbarry *et al*. (1998) suggest that FA does have some positive impact on growth, conditional on stable macroeconomic policy environment. Lensink and White (2001) test the hypothesis that FA is more effective when provided to countries where policies are sound and FA has negative returns at high levels of aid inflows. For more papers related to this conditional positive impact of FA, see Olaya and Wiehen, 2006; Isopi and Mattesini, 2008; Kaufmann *et al*., 2009; Epstein and Gang, 2009; Burnside and Dollar, 2004; Collier, 2000.

Third, there are skeptical scholars with arguments denying effectiveness of FA. From this point of view, FA has neither significant impact nor has it positive returns on economic growth. Kourtellos *et al*. (2007) suggest that there is a negative relationship between FA and growth. Eris (2008) suggests that FA flows are not effective in boosting growth regardless of the

quality of policy environment. According to Ovaska (2003) results from a fixed effects model indicated a negative relationship between FA and economic growth. Easterly (2001) also reaches a disappointing conclusion regarding FA, effectiveness. In Brumm (2003), FA negatively affects economic growth even for recipient nations with sound economic policies; it is shown that FA may have retarded development by leading to lower domestic savings, by distorting the composition of investment and thereby raising the capital-output ratio, by frustrating the emergence of an indigenous entrepreneurial class, and by inhibiting institutional reforms. Alvi *et al*. (2008a) indicate that their policy index[5] does not increase aid-effectiveness. Islam (1992) indicates that FA does not show any significant contribution to growth. Empirical results of Rao *et al*. (2007) show that the effect of FA on the steady state growth rate is insignificant in selected Pacific Island countries.

One possible explanation for these disappointing results is that recipient countries become more dependent on FA as more funding flows into them. And this extra funding can be an obstacle for them to develop their own robust growth structure. This has aroused skepticism about FA in the light of the current situation that billions of dollars are being spent to help poor nations. However, this does not mean that developed countries should not provide any financial aid to underdeveloped countries. The question is "how to finance", not "whether to finance or not".

Overall, this review[6] suggests that we might not be able to conclude with certainty about FA's impact. Some additional articles with categorized FA confirm this conclusion. Reddy and Minoiu (2006) and Minoiu and Reddy (2007) examined FA by considering two types, "developmental aid" and "geopolitical aid". They indicate that increasing the level of developmental aid (whether by changing the composition or level of total aid) can have a

[5] Alvi *et al*. (2008a) created a new policy index by incorporating two additional variables — credit to the private sector as a percentage of GDP and telephone main lines per 1000 people — into the index of Burnside and Dollar (2000) policy index. Burnside and Dollar index is a weighted sum of budget deficit/surplus, inflation, and Sachs-Warner openness index.

[6] There are many more articles on these 3 points about the effectiveness of aid. However we do not present all of them here because of space limitations.

sizable impact on long-run growth and there is no evidence that there are diminishing returns to FA nor that FA is only effective under "good" policy environments. Murphy and Tresp (2006) find little support for the view that good policy increases the probability that FA contributes to growth. In Pavlov and Sugden (2006), a positive relationship between FA and growth is identified, although it is subject to decreasing returns. Their research does not provide an adequate explanation for the role of institutions and policies of growth in the countries studied, nor does it determine whether FA only contributes to growth when favorable policy environments are in place.

There are some studies using this concept about disaggregating FA into several categories. But none of them examined the seven categories of FA according to purposes and functions as we do in our paper. Mavrotas (2002a) and Mavrotas (2002b) examine disaggregated FA data into three main components, namely programme aid, project aid and technical assistance. They suggest that the composition of FA matters for deriving robust conclusions on aid effectiveness. Mavrotas (2005) indicates that various categories of aid have different effects on key fiscal variables (e.g., project and food aids appear to cause a reduction in public investment whereas programme aid and technical assistance are positively related to public investment).

Clemens *et al*. (2004) categorize FA into three categories: (i) emergency and humanitarian aid; (ii) aid that affects growth only over a long period of time; and (iii) aid that plausibly could stimulate growth in four years, including budget and balance of payments support, investments in infrastructure, and aid for productive sectors such as agriculture and industry. They found a positive, causal relationship between "short-impact aid" and economic growth. Ouattara and Strobl (2008) include the four main aid modalities (project aid, financial program aid, technical assistance grants, and food aid) as explanatory variables and analyze various impacts of each modality on economic growth. Islam (1992) finds that decomposition of FA into various components shows that loans are more effective than grants

and food aid is more effective than commodity or project aids.[7)]

Our paper focuses on 'economic development' rather than 'economic growth' in FA recipient countries. Economic growth implies an increase only in quantitative output; it may or may not involve development. It is often measured by the rate of change in gross domestic product (e.g., percent GDP increase per year). Economic development typically involves improvements in a variety of indicators such as literacy rate, life expectancy, and poverty rates. GDP is sometimes criticized because it only covers quantitative increases of a nation's product. It is customary to say which countries are richer than others by looking at indicators such as GDP. However, countries with similar average incomes can differ substantially regarding people's quality of life (World Bank, 2004).

To clarify FA's impact on economic development, the following three hypotheses are examined; a) total FA and categorized FA in 7 functional categories are useful for economic development; b) all seven types of FA are useful at least for one purpose; c) appropriate environment is a significant "umbrella" under which FA might operate in a positive way (such as the presence of adequate polity).

This paper follows Kosack's (2003) research because it is significant when looking into the effectiveness of FA and democracy on the growth of quality of life rather than economic growth. In his research, as a dependent variable, the Human Development Index (HDI) is used to represent quality of life. In our paper we also use HDI, but we also use the Physical Quality of Life Index (PQLI)[8)] as a major dependent variable (besides economic growth). FA is examined in terms of its 7 major components, which are categorized by Development Assistance Committee (DAC)'s Creditor Reporting System (CRS), and in terms of FA's total amount. More details on aid categories and the quality of life indicators are provided in section 2.

[7)] Project aid is a type of aid which is given for a specific purpose. This involves the direct participation of the donors in the design and the implementation of a developmental project (Jelovac and Vandeninden, 2008).

[8)] A composite index proposed by Morris (1978). More information on PQLI and HDI is provided in section 2 below.

Section 3 presents empirical results obtained with various models, such as fixed affect (FE) and generalized method of moments (GMM). In section 4, we examine and discuss these results. Finally, section 5 concludes.

2. DATA AND METHODOLOGY

2.1. Data

2.1.1. Samples for regressions

The sample of countries was in the first place determined according to the sample chosen by Kosack's (2003) eminent paper which was in turn based on Burnside and Dollar's (2000) prominent paper. Thus, 45 FA recipient countries in Sub-Saharan Africa, Latin America, Middle East and North Africa, East Asia and South Asia were examined for 13 years from 1995 to 2007 (this sample was also determined according to data availability). However, subsequently,[9] we used a couple of different samples; one with 38 countries thus excluding 7 countries from the initial sample of 45 countries; these countries (Argentina, Brazil, Chile, Costa Rica, Malaysia, Mexico, and Uruguay) have since Kosack's work been upgraded to a higher social development index score (such as HDI) and hence it was reasonable to exclude them (FA is more important for those countries that have a lower social development index score). The quantitative results for this 38-country sample are not shown in this paper due to space limitations, however, they are similar to the other results presented here. The other sample is the one of 38 countries (just described) plus 23 countries[10] that have received substantial FA and still have a relatively low social development index score; in this case the number of countries examined is 61.[11] With both extra

[9] We are grateful to an anonymous referee's suggestion for trying other samples.

[10] The inclusion of these 23 countries has been possible only very recently due to the publication of the Human Development Report (HDR) November 2010, since annual consistent data are available in this report only.

[11] However, data for all variables are not available for all the 61 countries (and hence the

samples of countries (38-country and 61-country) we obtained similar results to those obtained by using the original sample of 45 countries. The general criteria for excluding the 7 countries from Kosack's sample and for including the 23 in our extra sample are as follows: first, in using the HDI we eliminated those countries that are above the category of medium HDI[12] by 2007; second, we still retained a small[13] number of countries from the high HDI if these countries still had a relatively high level of total FA per capita by 2007 (as shown in table 2); in any case, these 8 countries are situated at the lower section of the 'high HDI'.

2.1.2. Dependent variables

a) PQLI, HDI, and other social development indicators[14]

Regarding the PQLI, as first proposed by Morris (1978), three indicators are included: life expectancy at age 1, infant mortality, and literacy rate, which are used as representing development of health, sanitation, and education. According to Ray (2008), this index was constructed to study the effect of US aid or assistance given to developing countries. It has a merit of international appeal, as the indicators appeared to be in conformity with the common-sense understanding of development. According to Morris (1978), Gross National Product (GNP) is the standard measure of economic progress but does not show how output is distributed qualitatively. The PQLI, with signs of low infant mortality and lengthened life expectancy, paints a less fatalistic pessimistic picture than an equivalent GNP. PQLI data used in this paper are compiled by the authors based on Morris (1978)'s

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sample size varies according to variables used; see relevant tables for the exact sample size in each case).

12) There are four categories of HDI: very high, high, medium, and low.

13) These countries are Algeria, Colombia, Ecuador, Jamaica, Peru, Trinidad and Tobago, Tunisia, and Venezuela.

14) There are other measures/indexes such as female employment. Some others are also used as will be mentioned in later sections. However, it is out of scope of this paper to consider all possible measures of economic development to be used as dependent variables in our models.

calculation method.[15)]

Besides PQLI, we also used the HDI and some other indicators that are part of the group of Millennium Development Goals (MDGs). HDI scores, published in the United Nations Development Program (UNDP) Human Development Report (HDR), are now available on an annual basis since 1970[16)] for more than 170 countries (see November 2010 HDR). The HDI has been initially criticized but it was subsequently revised since its first appearance in 1990 and currently combines income, life expectancy, adult literacy, and school enrollment. Note that the correlation between HDI and PQLI is 0.84 for 45 countries and for the year 2007.

b) Infant mortality rate, child mortality ratio, and maternal mortality ratio

Infant mortality rate is the number of infants dying before reaching one year of age, per 1000 live births in a given year. According to King and Zeng (2001), infant mortality rate correlates very strongly with and is among the best predictors of country misfortune. This is also a useful indicator of a country's level of health or development, and is a component of the PQLI. Infant mortality data come from World Development Indicators 2008, World Bank.[17)] Child mortality ratio is under-5-year mortality per 1,000 and maternal mortality ratio is maternal mortality per 100,000 live births as defined by the World Bank. Data come from World Development Indicators 2010, World Bank.

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15) PQLI is calculated by [literacy rate + life expectancy rate + infant mortality rate] /3. For example, in 2005, Malawi's literacy rate, life expectancy, and infant mortality rate are 69.94, 15.05, and 98.15, respectively. From these values, the PQLI is equal to 61.05.

16) However, as our categorized FA data are available only since 1995, our panel data use the 1995-2007 period.

17) Data are not available for all years as infant mortality rates cannot change too rapidly. Thus, data are recorded at 5 year intervals. However, for our regressions we interpolated the missing years in a simple additive way. Consequently, some caution should be exercised in interpreting our regressions that used infant mortality rates as a dependent variable.

c) Adult literacy rate

Adult literacy rate is the percentage of people aged 15 and above who can, with understanding, read and write a short, simple statement in their everyday life. Data come from UNDP (2010).

d) Other dependent variables[18)]

The impacts of various categories of FA are examined using other quality of life indicators as dependent variables such as employment to population ratio (age above 15) and budget surplus/deficit (% of GDP). Also, MDGs indicators[19)] such as HIV prevalence among pregnant women aged 15-24 years, ratio of girls to boys in primary and secondary education, and primary education completion rate, age dependency ratio, are also examined. Data come from World Development Indicators 2010, World Bank.

e) Correlations between quality of life indicators and GDP per capita

Although these correlations are only valid for a particular year (we chose 2000 and 2005), they are still indicative of the inherent correlations of the panel data used in this paper.

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18) Besides these dependent variables used in our panel data analysis, foreign direct investment (FDI), health expenditure, telephone lines per 1000 people, number of vehicles, and number of physicians were also considered. However, the results for these variables are not included because they are not significant. In the case of FDI, its net flows was used in the fixed effects analysis which led to negative FDI values for some countries. Hence, FDI has insignificant effects on the quality of life. This result is supported by Kosack and Tobin (2006).

19) There are 60 MDGs indicators reported by the United Nations. Leo and Barmeier (2010) selected 8 core indicators among them in their research on "MDG progress index". These indicators are selected due to their (1) accuracy in capturing the original Millennium Declaration goals; (2) data availability; and (3) usage in the development literature. These 8 core indicators are: population below $1.25/day, % of underweight children, primary education completion rate, girls to boys ratio in primary and secondary education, access to improved water source, child mortality rate, maternal mortality ratio, and HIV/AIDS prevalence rate.

Table 1 Correlations between Quality of Life Indicators and GDP per Capita

Variable	2000	2005
PQLI	0.515 (38)	0.413 (38)
HDI	0.718 (35)	0.622 (38)
Adult Literacy Rate	0.42 (52)	0.394 (52)
Maternal Mortality Ratio	–0.527 (60)	–0.45 (60)
Child Mortality Ratio	–0.525 (60)	–0.44 (60)
Age Dependency Ratio	–0.584 (38)	–0.574 (38)
Gender Ratio	0.497 (45)	0.395 (48)
Primary Completion Rate	0.44 (46)	0.39 (49)
Employment Ratio	–0.387 (60)	–0.337 (60)
Budget Surplus/Deficit	0.07 (21)	0.55 (32)

Note: numbers in brackets show number of countries in the calculation of correlation coefficients.

2.1.3. Independent variables

a) Total aid

For FA, disbursements of official development assistance (ODA) from OECD's creditor reporting system (CRS) data (available from 1995 to 2007) are used. FA according to ODA, consists of loans, grants, technical assistance and other forms of cooperation extended by governments to developing countries. A significant proportion of ODA is aimed at promoting sustainable development in poorer countries, particularly through natural resource conservation, environmental protection and population programs (see Boyd, 2001). According to the OECD Development co-operation directorate, in CRS, FA data come from donors, including the 22 member countries of the OECD's Development Assistance Committee (DAC), the European Commission and other international organizations.

Table 2 Basic Statistics of Foreign Aid and GDP in 2007

Country	Total Aid US$ Million	Aid 1 %	Aid 2 %	Aid 3 %	Aid 4 %	Aid 5 %	Aid 6 %	Aid 7 %	GDP US$ Million	GDP per Capita US$	FA to GDP Ratio	FA per Capita US$
1. Algeria	427.7	56.5	22.2	4.7	9.3	0.1	2.3	4.8	10,153.61	4,018	0.042	12.582
2. Argentina	118.6	54.7	5.2	29.6	6.9	0.0	2.9	0.7	26,2421.1	6,645	0.000	3.003
3. Bangladesh	1,686	44.8	25.6	6.5	6.5	4.1	7.7	4.7	68,415	434	0.025	10.687
4. Benin	448	50.7	15.3	7.7	7.0	16.7	2.4	0.1	5,546	661	0.081	53.419
5. Bolivia	502.6	56.8	7.6	18.4	8.2	7.1	-0.2	2.1	13,120.1	1,378	0.037	50.606
6. Botswana	108.5	72.0	0.6	12.1	11.8	0.0	3.5	0.0	12,343.02	6,522	0.009	57.598
7. Burundi	475	32.8	7.3	13.4	5.4	15.1	6.5	19.5	980	125	0.485	60.592
8. Brazil	381	49.6	2.7	28.2	19.1	0.0	0.0	0.3	1,333,271	7,013	0.000	2.004
9. Cambodia	565	60.9	11.1	12.3	8.8	4.0	0.2	2.7	8,358	583	0.068	39.441
10. Cameroon	2,012.4	12.6	3.6	3.8	1.9	0.1	77.9	0.1	20,685.92	1,109	0.095	105.038
11. Central African Republic	217	23.2	1.5	11.5	6.8	27.6	8.1	21.4	1,712	402	0.127	51.079
12. Chile	133.6	31.6	48.6	5.3	14.2	0.0	0.0	0.3	16,3877.5	9,851	0.001	8.031
13. Colombia	714.7	62.2	1.3	15.3	7.0	0.0	0.0	14.2	207,785.6	4,684	0.003	16.231
14. Congo. Dem. Rep.	1,438	36.5	9.6	1.5	5.9	1.3	20.3	24.8	9,977	160	0.144	22.995
15. Costa Rica	115.6	26.1	22.2	19.4	12.6	0.0	17.8	1.8	26,267.16	5,891	0.004	25.926

16. Cote d’ Ivoire	291.1	55.5	0.3	8.9	4.3	0.7	14.1	16.2	19,795.7	984	0.014	14.262
17. Dominican Republic	236.8	58.4	4.6	12.3	7.5	11.7	2.1	3.3	41,316.54	4,210	0.006	24.048
18. Ecuador	252.5	66.4	2.8	12.1	17.5	0.2	0.0	1.0	45,789.37	3,432	0.005	18.663
19. Egypt	1,523.7	28.6	21.0	5.6	7.2	26.4	11.1	0.1	130,472.9	1,630	0.012	18.861
20. El Salvador	213.4	55.0	13.8	4.7	17.6	3.2	0.7	4.9	20,372.6	3,336	0.010	34.879
21. Ethiopia	2,383	58.7	15.6	4.7	3.1	5.9	0.7	11.2	19,182	244	0.125	30.329
22. Gabon	90	51.8	8.1	29.5	10.3	0.0	0.1	0.3	11,571	8,138	0.008	63.031
23. Gambia	78.1	74.4	10.5	7.8	3.6	3.2	0.4	0.1	650.9347	403	0.120	34.497
24. Ghana	1,092.4	49.4	17.1	10.0	3.5	18.3	0.9	0.9	14,942.4	653	0.073	35.941
25. Guatemala	518.6	38.9	1.5	3.6	8.7	5.0	38.8	3.5	34,030.91	2,548	0.015	38.641
26. Guyana	67.6	69.4	2.2	12.3	12.7	2.7	0.0	0.7	1,074.331	1,406	0.060	84.002
27. Honduras	421	48.2	6.3	6.7	9.5	4.5	21.6	3.0	11,985.81	1,671	0.035	50.738
28. India	2,848.1	54.3	26.8	10.8	5.9	1.2	0.0	1.0	1,176,890	1,046	0.002	1.814
29. Indonesia	2,538.9	39.1	16.1	11.1	6.2	16.2	2.3	9.0	431,933.3	1,923	0.005	10.193
30. Jamaica	86.3	30.4	27.6	19.4	11.9	2.1	7.1	1.6	12,848.69	4,802	0.007	32.223
31. Kenya	1,325.2	51.2	16.2	8.8	4.1	5.6	2.2	11.8	27,124.39	718	0.049	29.400
32. Kyrgyz Republic	201	58.2	11.1	13.8	8.5	7.5	0.4	0.6	3,803	726	0.053	38.369
33. Lao PDR	302	44.4	22.4	19.7	8.9	3.9	0.1	0.7	4,286	704	0.070	49.651

34. Madagascar	849.3	32.1	23.6	14.5	6.5	10.1	11.0	2.2	7,342.826	395	0.116	32.197
35. Malawi	1,720.5	23.0	1.4	5.1	1.8	7.0	61.0	0.7	3,585.858	248	0.480	53.949
36. Mali	971	37.8	17.2	14.2	6.3	8.8	15.0	0.7	7,146	576	0.136	78.223
37. Malaysia	340.7	32.6	63.1	2.2	1.9	0.0	0.0	0.1	186,720.6	7,031	0.002	12.830
38. Mexico	215.9	68.6	2.7	8.7	18.4	0.0	0.0	1.6	1,022,815	9,715	0.000	2.051
39. Moldova	252	44.9	10.3	7.3	3.3	29.8	1.4	3.1	4,402	1,231	0.057	68.624
40. Mongolia	197	56.3	21.1	9.4	10.5	1.7	0.5	0.5	3,930	1,505	0.050	75.523
41. Morocco	1,303.3	55.7	33.6	3.2	6.5	0.0	0.1	0.9	75,226.32	2,373	0.017	41.634
42. Mozambique	1,611	48.7	15.0	6.3	3.7	23.8	0.7	1.8	8,030	367	0.200	73.658
43. Myanmar	184	59.3	1.7	4.5	7.2	1.6	2.2	23.5				3.735
44. Namibia	206	69.0	6.5	8.1	16.2	0.1	0.0	0.1	8,806	4,216	0.023	98.752
45. Nicaragua	649.8	46.2	7.4	14.9	12.6	13.0	0.8	5.2	5,725.935	1023	0.113	99.731
46. Niger	487.6	43.6	9.6	9.9	9.2	19.8	2.3	5.5	4,245.7	300	0.115	26.380
47. Nigeria	2,012.1	42.8	14.5	2.5	1.5	0.7	37.9	0.1	165,920.9	1,123	0.012	10.967
48. Pakistan	2,157.8	63.0	14.9	3.6	2.3	3.3	0.5	12.4	143,203	881	0.015	6.888
49. Papua New Guinea	351	59.2	21.4	8.8	9.9	0.0	0.0	0.6	6,329	985	0.055	54.608
50. Paraguay	110	52.0	5.0	17.7	13.0	8.7	1.2	2.4	12,222.29	1,995	0.009	16.975
51. Peru	614.1	43.3	19.6	15.5	10.7	1.8	2.0	7.1	107,492.2	3,771	0.006	21.257

52. Philippines	1,044.9	26.9	55.1	6.2	9.9	0.0	0.1	1.8	144,042.7	1,624	0.007	11.497
53. Rwanda	674	54.6	7.7	5.6	7.4	22.7	0.3	1.8	3,412	361	0.198	71.321
54. Senegal	727.3	58.4	13.9	11.6	8.8	3.8	3.0	0.4	11,319.74	952	0.064	46.160
55. Sri Lanka	782.9	36.5	20.0	8.7	6.9	1.0	0.8	26.2	32,363.37	1,617	0.024	31.034
56. Sudan	1,947	23.8	0.1	1.1	8.1	2.6	0.1	64.2	46,531	1,151	0.042	48.142
57. Syrian Arab Republic	169.2	80.1	2.8	4.8	6.7	0.0	0.0	5.6	40,548.66	2,019	0.004	8.515
58. Tajikistan	165	53.1	10.8	15.9	7.3	7.0	0.3	5.6	3,712	552	0.044	24.569
59. Tanzania	2,734	36.3	9.3	6.1	1.9	20.9	23.7	1.8	16,826	420	0.162	66.237
60. Thailand	318.8	39.5	25.9	14.3	5.1	0.0	0.5	14.7	247,111.4	3,689	0.001	4.763
61. Togo	128	76.9	0.6	1.4	7.8	0.3	10.7	2.3	2,498.943	397	0.051	20.316
62. Trinidad and Tobago	17.5	76.6	0.0	20.6	2.9	0.0	0.0	0.0	21,717.24	16,351	0.001	13.041
63. Tunisia	560.8	53.4	15.4	10.9	6.8	13.4	0.0	0.1	35,019.91	3,425	0.016	54.863
64. Uganda	1,625	49.6	16.6	9.1	2.4	9.5	0.3	12.5	11,892	388	0.136	53.027
65. Uruguay	36.9	58.0	3.3	20.9	17.1	0.0	0.0	0.8	24,253.81	7,297	0.002	11.101
66. Venezuela	62.1	71.5	0.3	2.7	4.5	0.0	0.0	20.9	228,070.8	8,299	0.0003	2.291
67. Vietnam	1,548	35.7	39.3	10.3	9.8	4.3	0.4	0.2	68,435	804	0.023	18.174
68. Zambia	920.2	59.0	4.2	7.2	3.8	17.4	7.1	1.4	11,410.06	927	0.081	66.916

Notes: i) This table shows all countries used in this paper according to the 3 samples as explained in the text. The 7 countries erased from the 45-country sample plus the 61 countries of the 61-country sample make a total of 68 countries (hence Zambia is number 68).

The objective of the CRS aid activity database is to provide a set of readily available basic data that enables analysis on where FA flows, what purpose it serves and what policies it aims to implement, on a comparable basis for all DAC members. When disbursements data are not available, Rajan and Subramanian (2008)'s method is used in our paper to convert commitments data to disbursements by taking the ratio of commitments in each sector to overall commitments and then multiplying this by aggregate aid disbursements. Table 2 shows total FA, FA to GDP ratio and FA per capita.

b) Sub-categories of FA

Table 2 shows the percentage of each sub-category of FA to total FA. According to purpose codes in the CRS, 7 major ODA data are examined. More information on these categories is shown in table 3.

Table 3 Categories of Aid

1. SOCIAL INFRASTRUCTURE AND SERVICES
110. Education
111. Education, level unspecified
112. Basic education
113. Secondary education
114. Post-secondary education
120. Health
121. Health, general
122. Basic Health
130. Population policies/programs and reproductive health
140. Water and sanitation
150. Government and civil society
151. Government and civil society, general
152. Conflict prevention and resolution, peace and security
160. Other social infrastructure and services

2. ECONOMIC INFRASTRUCTURE AND SERVICES
210. Transport and storage

220. Communication

230. Energy generation and supply

240. Banking and financial services

250. Business and other services

3. PRODUCTION SECTORS
311. Agriculture
312. Forestry
313. Fishing

321. Industry
322. Mineral resources and mining
323. Construction

331. Trade policy and regulations and trade-related adjustment
332. Tourism

4. MULTISECTOR/CROSS-CUTTING
410. General environmental protection

430. Other multi sector
43030. Urban development and management
43040. Rural development

5. COMMODITY AID AND GENERAL PROGRAM ASSISTANCE
510. General budget support

520. Developmental food aid/Food security assistance

530. Other commodity assistance

6. ACTION RELATING TO DEBT

7. HUMANITARIAN AID

Within the overall definition of ODA, humanitarian aid is assistance designed to save lives, alleviate suffering and maintain and protect human dignity during and in the aftermath of emergencies. To be classified as humanitarian, aid should be consistent with the humanitarian principles of humanity, impartiality, neutrality and independence.

720. Emergency response

730. Reconstruction relief and rehabilitation

740. Disaster prevention and preparedness

c) Polity index

The Polity conceptual scheme is unique in that it examines concomitant qualities of democratic and autocratic authority in governing institutions. This perspective envisions a spectrum of governing authority that spans from fully institutionalized autocracies through mixed, or incoherent authority regimes (termed "anocracies") to fully institutionalized democracies. The "Polity Score" captures this regime authority spectrum on a 21-point scale ranging from –10 (hereditary monarchy) to +10 (consolidated democracy). Data come from the Polity IV project.[20] This index is used in our model to represent each recipient country's political and governance situation. This variable is expected to have a positive sign on the quality of life and economic growth.

d) M2 (Money and quasi money)

M2 is a broader classification of money than M1. M2 can be used when looking to quantify the amount of money in circulation and to explain different economic monetary conditions (as defined in the web dictionary

[20] See Marshall and Jaggers (2008) regarding political regime characteristics and transitions from 1800 to 2008.

"Investorwords"). The ratio of M2 (money and quasi-money) to GDP is a measure of quality of national financial market and financial depth (see Rajan and Subramanian, 2008, who used this variable). Data come from[21] the World Development Indicators 2008 (for the 45-country sample) and 2010 (for the 61-country sample), World Bank. This variable is expected to have a positive sign on the quality of life and economic growth.

e) GDP per capita

GDP per capita is gross domestic product divided by midyear population. Data are in current U.S. dollars. It represents a country's total income. This variable is expected to have a positive sign on the quality of life and economic growth.

f) Openness (trade to GDP ratio)

The trade to GDP-ratio is the sum of exports and imports divided by GDP. This indicator measures a country's "openness" or "integration" in the world economy (OECD statistics). Sarkar (2007) used this concept to measure openness and examined its effect on economic growth. This variable is expected to have a positive or negative sign on the quality of life and economic growth.

g) Terms of trade

It controls for fluctuations in the international economy (particularly changes in primary commodity prices, on which many of the economies of developing countries are based, see Kosack, 2003). This variable is expected to have a positive or negative sign on the quality of life and economic growth.

h) Inflation

Inflation as measured by the annual growth rate of the GDP implicit

[21] The same source is used for all the variables below up to category "j)" of military expenditure.

deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. According to Fischer (1993), inflation rate is taken as a measure of the quality of a country's monetary policy. This variable is expected to have a negative sign on the quality of life and economic growth.

i) Population growth rate

This is added to the model to display the effect of each country's population growth on its dependent variables. This variable is expected to have a negative sign on the quality of life and economic growth.

j) Military expenditure

Military expenditure as a percentage of GDP is used to describe the recipient countries' stability in terms of military conditions. This variable is expected to have a negative effect on the quality of life.

2.2. Methodology

2.2.1. Fixed effects

Fixed effects (FE) analysis for various dependent variables (PQLI, HDI, infant mortality rate, age dependency ratio, etc) is conducted based on yearly data. The FE model takes into account the individual country effect but does not fully consider both way causation of explanatory variables as the GMM model does. We present FE and GMM models for robustness. In most cases the results are similar.

2.2.2. System GMM

System GMM estimator (see Wooldridge, 2002) reduces the potential biases and imprecision associated with the usual difference estimator by combining, in a system, the regression in differences with the regression in levels (see Horioka and Wan, 2007). An example of the use of system GMM applied on FA's impact is the work by Moreira (2003) who found a

positive impact of FA on economic growth. The main advantage of system GMM is to handle the potential endogeneity problems. For example, FA may affect the quality of life but also to latter may affect FA through increases in GDP.

In estimating system GMM analysis, lagged dependent variables are also used in our models. This can allow the inclusion of the effects of variables from past periods. Thus if we take an autoregressive process (see Johnston and Dinardo, 1997), we can check this inclusion from the following equation (1).

$$\begin{aligned} Y_t &= a + bX_t + AY_{t-1} \\ &= a + bX_t + A(a + bX_{t-1}) \\ &= \cdots \text{ and so on for all past values.} \end{aligned} \tag{1}$$

Consequently, the effects of FA can be both short and long term through the use of this lagged dependent variable. To further confirm the short/long term consideration we also conducted regressions based on 3-year-average data. In this case, there are 4 time periods; 1995-1997, 1998-2000, 2001-2003, and 2004-2006 in the panel data.

2.2.3. Cross section

Although cross-section analysis is deemed to have more inherent problems than FE or GMM models, we also use it sometimes for robustness. Note that robustness of results is our aim in this paper: thus many dependent variables and 3 models (FE, GMM, cross section) are used.

3. EMPIRICAL RESULTS

Fixed effects and GMM results[22] are shown in tables 4 to 15 according to

[22] Cross-section regression was also tried out with PQLI as the dependent variable. Four

the choice of dependent variable. Table 4 and table 5 show our FE and GMM results for the dependent variable HDI. Table 6 and table 7 show our FE and GMM results for PQLI. GMM results for PQLI based on 3-year average data are shown in table 14. From Table 8 to Table 14 we present FE and GMM results for various dependent variables like adult literacy rate, infant mortality rate, age dependency ratio, child mortality ratio, ratio of girls to boys in primary and secondary education, employment ratio, and budget surplus/deficit. In table 15, FE results with GDP growth as dependent variable are presented. In all these models, FA total and its categories are used as independent variables.[23)]

3.1. Composite Indicators as Dependent Variables

3.1.1. HDI as dependent variable

Table 4 shows our FE results by using the 61-country sample (as explained in sub-section 2.1.1.). One year lagged value of each category of aid is also included to account for possible lag effects.[24)] We can see that total FA, Aid 1 (Social infrastructure and services), Aid 2 (Economic infrastructure and services), Aid 6 (Action related to debt), and Aid 7 (Humanitarian aid) have significant and positive impact on HDI. Control variables like polity, GDP per capita, openness, M2, inflation, population growth, and military expenditure also show significant effects (with correct coefficient signs).

Table 5 shows our GMM results by using the 61-country sample again. All categories of FA have significant effects on HDI. Also, the control variables used in the regression have significant and positive impacts.

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categories of FA (Total Aid, Aid 1, Aid 4, and Aid 6) show positive association with the quality of life index.

23) The ratio of each category of FA to GDP is also used in the GMM regression analysis with PQLI and infant mortality as dependent variables. Results are similar to our overall conclusions (not shown here).

24) More lags were also included (e.g., 2 year lag) but only 1 year lag was found to be significant.

Table 4 FE Results with the 61-country Sample (Dependent Variable: HDI)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Type	3.08E-12***	4.28E-11***	3.92E-12*	2.64E-11	2.60E-11	2.75E-12	2.11E-12	3.95E-12
	(2.96)	(7.29)	(0.56)	(1.43)	(1.33)	(0.31)	(1.08)	(0.39)
Aid Type Lagged 1year	4.8E-12***	2.97E-11***	–2.53E-12	–1.48E-11	2.85E-12	–3.01E-12	5.27E-12***	1.93E-11*
	(3.14)	(4.27)	(–0.37)	(–0.82)	(0.15)	(–0.35)	(2.58)	(1.67)
Polity	0.0005*	0.0002	0.0007**	0.0007**	0.0007**	0.0006**	0.0006*	0.0006**
	(1.93)	(0.97)	(2.33)	(2.41)	(2.52)	(2.05)	(1.88)	(2.24)
GDP per Capita	0.00001***	0.00001***	0.00001***	0.00001***	0.00001***	0.00003***	0.00001***	0.00002***
	(6.12)	(5.63)	(7.01)	(6.72)	(6.79)	(8.55)	(4.13)	(7.58)
Openness	0.0005***	0.0004***	0.0005***	0.0005***	0.0005***	0.00045***	0.0006***	0.0004***
	(7.15)	(5.72)	(7.4)	(7.21)	(7.27)	(5.81)	(6.24)	(5.99)
M2	0.0015***	0.0013***	0.0015***	0.0015***	0.0015***	0.0015***	0.0015***	0.0015***
	(10.71)	(10.32)	(9.87)	(10.12)	(10.08)	(9.99)	(7.1)	(10.2)
Inflation	–0.0001*	–0.0001**	–0.0001*	–0.0001*	–0.0001*	–0.0001**	–0.0002***	–0.0001**
	(–1.93)	(–2.07)	(–1.81)	(–1.82)	(–1.75)	(–2.03)	(–2.61)	(–2)
Population Growth	–0.007***	–0.006***	–0.007***	–0.007***	–0.007***	–0.007***	–0.0059***	–0.0077***
	(–5.6)	(–5.14)	(–5.12)	(–5.35)	(–5.31)	(–5.31)	(–4.23)	(–5.91)

Military Expenditure	–0.006***	–0.005***	–0.007***	–0.006***	–0.007***	–0.007***	–0.006***	–0.007***
	(–5.88)	(–5.6)	(–6.00)	(–6.05)	(–6.13)	(–6.21)	(–5.36)	(–6.11)
Constant	0.457	0.462	0.456	0.457	0.457	0.437	0.420	0.454
	(75.29)	(84.01)	(70.49)	(70.7)	(71.88)	(68.81)	(51.46)	(70.9)
Observations	501	499	489	499	499	446	350	459
Number of Countries	49	49	49	49	49	46	44	49
R-sq (within)	0.6086	0.68	0.5795	0.5776	0.5768	0.629	0.5286	0.6052
R-sq (between)	0.5058	0.4426	0.5535	0.5477	0.551	0.6632	0.5223	0.6101

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. ii) Although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 49, and so on. iii) Yearly data for HDI are available only in the November 2010 report.

Table 5 GMM Results with the 61-country Sample (Dependent Variable: HDI)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
HDI Lagged 1year	0.909***	0.922***	0.920***	0.893***	0.868***	0.930***	0.900***	0.908***
	(224.44)	(294.45)	(196.58)	(158.24)	(111.47)	(216.83)	(183.24)	(277.73)
Aid Type	3.41E-13***	5.68E-12***	1.13E-11***	4.43E-11***	5.17E-11***	3.69E-12**	2.35E-12***	4.21E-12***
	(4.31)	(10.62)	(8.95)	(14.3)	(12.16)	(2.06)	(10.00)	(8.17)
Polity	0.0002***	0.00007**	0.00006***	0.0002***	0.0002***	0.00007**	0.00007**	0.0002***
	(4.61)	(2.08)	(2.82)	(4.24)	(2.7)	(2.01)	(2.41)	(3.14)
GDP per Capita	2.37E-06***	2.02E-06***	2.40E-06***	3.02E-06***	3.40E-06***	3.64E-06***	3.33E-06***	2.74E-06***
	(14.32)	(9.51)	(21.29)	(12.4)	(16.16)	(12.07)	(12.41)	(14.76)
Openness	0.0001***	0.0001***	0.00009***	0.00009***	0.0001***	0.00008***	0.00008***	0.0001***
	(14.51)	(17.21)	(17.5)	(12.66)	(12.74)	(28.81)	(11.35)	(16.61)
M2	0.0001***	0.00008***	0.00008***	0.0001***	0.0001***	0.00005***	0.0002***	0.0001***
	(7.03)	(4.16)	(5.86)	(9.79)	(8.84)	(4.74)	(6.32)	(7.47)
Inflation	–0.00002**	–0.00004***	–0.00003***	4.48E-06	–1.56E-06	–0.00006***	–0.00004***	–0.00004***
	(–2.17)	(–5.65)	(–3.88)	(0.45)	(–0.13)	(–7.13)	(–3.87)	(–6.54)
Population Growth	–0.002***	–0.002***	–0.002***	–0.003***	–0.005***	–0.001***	–0.002***	–0.002***
	(–5.76)	(–6.82)	(–5.03)	(–6.51)	(–9.2)	(–4.84)	(–11.25)	(–6.01)

Military Expenditure	–0.0009***	–0.0008***	–0.001***	–0.0009***	–0.001***	0.00004	–0.0007***	–0.0003*
	(–3.6)	(–5.41)	(–7.47)	(–4.32)	(–3.44)	(0.32)	(–9.42)	(–1.92)
Cons.	0.046	0.039	0.041	0.054	0.068	0.0340	0.047	0.045
	(20.87)	(23.91)	(12.73)	(16.89)	(13.71)	(13.49)	(35.86)	(18.77)
Observations	501	500	495	500	500	458	377	477
Number of Countries	49	49	49	49	49	48	46	49
AR(2)	0.253	0.113	0.202	0.131	0.834	0.307	0.6	0.289
Hansen Test	0.604	0.432	0.545	0.669	0.484	0.309	0.738	0.544

Notes: i) Instruments for orthogonal deviations equation, Standard FOD.(polity popgrowth inflation) GMM-type (missing=0, separate instruments for each period unless collapsed); L(2/6). (hdi1 aid polity L.gdpcap L.open2 m2 L.inflation L.military), collapsed, Instruments for levels equation, Standard _cons polity popgrowth inflation, GMM-type (missing=0, separate instruments for each period unless collapsed) DL. (hdi1 aid polity L.gdpcap L.open2 m2 L.inflation L.military) collapsed. ii) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. iii) although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 49, and so on.

3.1.2. PQLI as dependent variables

Table 6 shows our FE results with the 45-country sample. We can see that, Total aid, Aid 1 (Social infrastructure and services), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have significant and positive impacts. Most of control variables like polity, M2, GDP per capital, openness, inflation, population growth, and military expenditure also have significant effects on PQLI.

Table 7 shows our GMM results, again with the 45-country sample. We can see that all categories of FA, positively affect PQLI. Control variables like polity, GDP per capita, M2, and population growth show significant effects.

3.2. Individual Indicators as Dependent Variables

a) Adult literacy rate

In table 8, FE results with 61-country sample are shown. We can see that Total aid, Aid 1 (Social infrastructure and services), Aid 2 (Economic infrastructure and services), and Aid 7 (Humanitarian aid) have significant and positive impacts on Adult literacy rate. GMM results with 61-country sample which are presented in table 9 show that Total aid, Aid 1 (Social infrastructure and services), Aid 2 (Economic infrastructure and services), Aid 4 (Multisector/cross-cutting), Aid 5 (Commodity aid and general program assistance), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have significant effects. GMM results with 45-country sample are presented in table 10; they show that only the categories of aid number 1, 4, 5, and 7 positively affect the adult literacy rate. Most of control variables also have significant coefficients with expected signs.

b) Infant mortality rate

In table 11, FE results with 45-country sample are presented. We can see that Total aid, Aid 1 (Social infrastructure and services), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have significant effects.

Table 6 FE Results with the 45-country Sample (Dependent Variable: PQLI)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Type	3.07E-10	4.20E-09***	–2.85E-10	1.14E-10	–4.44E-10	–2.14E-09	4.00E-10*	7.30E-09**
	(1.56)	(2.86)	(–0.61)	(0.03)	(–0.13)	(–1.05)	(1.68)	(2.44)
Polity	0.132**	0.108*	0.142**	0.141**	0.141**	0.136**	0.133**	0.130**
	(2.36)	(1.97)	(2.54)	(2.53)	(2.53)	(2.44)	(2.38)	(2.35)
M2	0.149***	0.145***	0.146***	0.146***	0.146***	0.148***	0.149***	0.151***
	(5.56)	(5.45)	(5.41)	(5.44)	(5.44)	(5.50)	(5.56)	(5.65)
GDP per Capita	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***	0.0006***
	(2.97)	(2.66)	(2.96)	(2.99)	(2.99)	(2.99)	(2.97)	(2.89)
Openness	0.078***	0.072***	0.079***	0.079***	0.079***	0.082***	0.079***	0.077***
	(4.59)	(4.22)	(4.66)	(4.63)	(4.64)	(4.76)	(4.68)	(4.57)
Inflation	–0.032**	–0.031**	–0.032**	–0.032**	–0.032**	–0.030**	–0.032**	–0.029**
	(–2.30)	(–2.23)	(–2.30)	(–2.30)	(–2.22)	(–2.09)	(–2.27)	(–2.11)
Population Growth	–4.672***	–4.396***	–4.781***	–4.784***	–4.786***	–4.808***	–4.683***	–4.683***
	(–6.86)	(–6.41)	(–7.05)	(–7.05)	(–7.05)	(–7.09)	(–6.89)	(–6.93)
Military Expenditure	–3.045***	–3.083***	–3.109***	–3.103***	–3.099***	–3.122***	–3.045***	–2.943***
	(–5.99)	(–6.12)	(–63.11)	(–6.08)	(–6.09)	(–6.14)	(–6.00)	(–5.78)
Observations	463	463	463	463	463	463	463	463
Number of Countries	41	41	41	41	41	41	41	41
R-sq (within)	0.43	0.43	0.42	0.42	0.42	0.42	0.43	0.43
R-sq (between)	0.30	0.28	0.30	0.30	0.30	0.30	0.29	0.33

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. ii) Although the sample used contains 45 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is 41.

Table 7 GMM Results with the 45-country Sample (Dependent Variable: PQLI)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Type	4.16E-10***	1.58E-09***	4.18E-10***	–2.16E-09	8.59E-09***	1.81E-09	7.33E-10**	–6.20E-10
	(6.05)	(3.17)	(4.13)	(–1.04)	(2.89)	(1.37)	(2.51)	(–0.92)
PQLI Lag 1 year	0.847***	0.864***	0.853***	0.854***	0.763***	0.843***	0.831***	0.846***
	(42.27)	(34.44)	(40.88)	(28.99)	(19.68)	(30.28)	(35.21)	(31.70)
Polity	0.086*	0.129**	0.050	0.152***	0.245***	0.099*	0.168***	0.152**
	(1.65)	(2.19)	(0.84)	(2.77)	(3.81)	(1.70)	(3.07)	(2.29)
GDP per Capita	0.0005***	0.0002**	0.0005***	0.0004***	0.0004***	0.0004***	0.0005***	0.0004***
	(5.30)	(2.04)	(4.52)	(2.83)	(3.18)	(2.93)	(3.42)	(2.84)
Openness	–0.0004	-0.0004	0.002	0.017**	0.024***	0.011*	0.014**	0.015**
	(–0.07)	(-0.05)	(0.34)	(2.05)	(3.45)	(1.64)	(2.00)	(2.27)
Terms of Trade	0.005*	0.004	0.008**	0.007[a]	0.024	0.004	0.004	0.005
	(1.77)	(1.18)	(1.99)	(1.55)	(0.69)	(1.07)	(1.37)	(1.10)
M2	0.038***	0.012	0.039***	0.041***	0.033**	0.029***	0.036***	0.033***
	(5.36)	(1.14)	(6.13)	(5.25)	(2.35)	(3.45)	(4.15)	(4.43)
Inflation	0.004	0.0001	0.0002	0.160**	0.012	0.006	0.019***	0.010

	(0.99)	(0.01)	(0.05)	(2.35)	(1.46)	(0.70)	(3.22)	(1.37)
Population Growth	–3.024***	–1.622**	–3.264***	–1.935***	–2.165***	–2.729***	–2.174***	–2.015***
	(–3.97)	(–2.23)	(–4.05)	(–4.00)	(–3.25)	(–4.61)	(–3.19)	(–2.84)
Military Expenditure	–0.291	–0.298[a]	–0.531**	–0.173	0.219	–0.403*	0.008	–0.189
	(–1.47)	(–1.54)	(–2.53)	(–0.98)	(0.81)	(–1.78)	(0.03)	(–0.82)
Primary School Enrollment	0.010	0.037***	0.021*	0.016	0.083***	0.033[a]	0.011	0.032*
	(0.97)	(2.69)	(1.70)	(0.73)	(2.75)	(1.54)	(0.69)	(1.85)
Observations	247	247	247	247	247	247	247	247
Number of Countries	38	38	38	38	38	38	38	38
AR(2)	0.481	0.585	0.460	0.955	0.730	0.422	0.684	0.608
Hansen Over-id Test	0.418	0.519	0.298	0.386	0.575	0.288	0.287	0.340

Notes: i) Instruments for first differences equation standard D (polity military); GMM-type (missing=0, separate instruments for each period unless collapsed) L3/9). (pqli popgrowth gdpcap open aid) collapsed. instruments for levels equation; Standard _cons polity military. ii) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] almost significant at the 12% level.

Table 8 FE Results with 61-country Sample (Dependent Variable: Adult Literacy Rate)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Type	6.52E-10***	6.09E-09***	2.08E-09*	3.30E-09	4.20E-09	1.48E-09	3.81E-10	4.42E-09***
	(3.69)	(5.73)	(1.77)	(1.06)	(1.27)	(0.98)	(1.17)	(2.74)
Aid Type Lagged 1year	5.11E-10**	2.49E-09**	–2.41E-10	–2.93E-09	–6.78E-10	–5.40E-10	5.93E-10*	1.89E-09
	(1.97)	(1.97)	(-0.21)	(–0.96)	(–0.21)	(–0.36)	(1.75)	(1.02)
Polity	0.185***	0.156***	0.200***	0.211***	0.214***	0.209***	0.172***	0.217***
	(4.10)	(3.56)	(4.16)	(4.53)	(4.61)	(4.34)	(3.26)	(4.89)
GDP per Capita	0.0016***	0.0014***	0.0019***	0.0018***	0.0018***	0.0030***	0.0026***	0.0014***
	(4.66)	(4.26)	(5.49)	(5.32)	(5.36)	(5.59)	(5.09)	(3.59)
Openness	0.062***	0.047***	0.069***	0.065***	0.0655***	0.065***	0.101***	0.067***
	(5.28)	(4.08)	(5.59)	(5.39)	(5.43)	(4.92)	(5.84)	(5.63)
M2	0.197***	0.176***	0.189***	0.198***	0.195***	0.194***	0.245***	0.191***
	(8.36)	(7.67)	(7.62)	(7.94)	(7.95)	(7.5)	(7.19)	(8.07)
Inflation	–0.022**	–0.022**	–0.022**	–0.022**	–0.021**	–0.027**	–0.0404***	–0.025**
	(–2.24)	(–2.31)	(–2.19)	(–2.13)	(–2.07)	(–2.43)	(–3.09)	(–2.43)
Population Growth	–0.623**	–0.500**	–0.681***	–0.634***	–0.628**	–0.473**	–0.433*	–0.490**
	(–2.97)	(–2.46)	(–3.09)	(–2.91)	(–2.89)	(–2.16)	(–1.87)	(–2.33)

Military Expenditure	–0.469***	–0.376**	–0.518***	–0.539***	–0.549***	–0.569***	–0.485**	–0.637***
	(–2.69)	(–2.22)	(–2.84)	(–3)	(–3.06)	(–3.17)	(–2.51)	(–3.7)
Cons.	58.500	59.090	58.272	58.507	58.467	55.763	49.344	58.738
	(56.8)	(59.31)	(53.58)	(53.61)	(54.5)	(51.31)	(36.39)	(56.96)
Observations	501	499	489	499	499	446	350	459
Number of Countries	49	49	49	49	49	46	44	49
R-sq (within)	0.4862	0.5237	0.4507	0.4532	0.4529	0.4891	0.5011	0.5004
R-sq (between)	0.2112	0.1542	0.2561	0.2497	0.2503	0.2484	0.3266	0.2468

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. ii) Although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 49, and so on.

Table 9 GMM Results with 61-country Sample (Dependent Variable: Adult Literacy Rate)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Lag1year	1.66E-09***	1.23E-08***	1.46E-09***	–3.03E-09	1.08E-08*	1.18E-09***	1.64E-09***	5.10E-09***
	(7.80)	(6.47)	(2.69)	(–1.07)	(1.70)	(3.76)	(12.98)	(9.50)
Polity	0.639***	0.576***	0.510***	0.576***	0.340**	0.313***	0.238***	0.515***
	(7.32)	(4.87)	(6.00)	(4.73)	(2.44)	(5.14)	(12.34)	(9.23)
GDP per Capita	0.001***	0.0004	0.002***	0.001***	0.002***	0.002***	0.002***	0.0009***
	(3.94)	(0.77)	(7.50)	(3.45)	(3.58)	(18.97)	(10.72)	(7.15)
Openness	-0.001	0.012	0.032***	0.044***	0.0224	0.016***	0.055***	0.036***
	(-0.05)	(0.36)	(2.64)	(2.69)	(0.81)	(2.87)	(7.18)	(9.16)
M2	0.294***	0.199***	0.239***	0.251***	0.295***	0.267***	0.353***	0.296***
	(15.38)	(3.58)	(7.28)	(4.28)	(3.71)	(15.54)	(27.82)	(14.21)
Inflation	–0.014*	–0.025	0.002	–0.048***	–0.034*	-0.024***	–0.121***	–0.016**
	(–1.88)	(–1.31)	(0.33)	(–2.76)	(–1.81)	(-6.45)	(–13.89)	(–2.2)
Population Growth	–2.577***	–1.838**	–3.700***	–3.398***	–3.7586***	–2.755***	–1.896***	–1.539***
	(–4.4)	(–2.12)	(–6.41)	(–4.21)	(–3.35)	(–13.55)	(–10.28)	(–7.14)
Military Expenditure	–1.509***	–1.506***	–1.023***	–1.504***	–1.535***	–1.727***	–1.069***	–1.472***
	(–5.18)	(–4.02)	(–4.57)	(–3.24)	(–3.08)	(–10.59)	(–11.38)	(–9.09)

Cons.	64.401	66.720	67.251	65.991	66.541	64.417	54.239	60.404
	(21.79)	(16.99)	(25.07)	(16.45)	(13.95)	(39.2)	(42.55)	(39.82)
Observations	501	499	492	499	499	453	375	471
Number of Countries	49	49	49	49	49	47	46	49
AR(2)	0.25	0.595	0.082	0.372	0.127	0.228	0.894	0.106
Hansen Test	0.658	0.402	0.31	0.237	0.159	0.58	0.673	0.282

Notes: i) Instruments for orthogonal deviations equation, standard, FOD. (polity military) GMM-type (missing=0, separate instruments for each period unless collapsed), L(3/10). (lit aid gdpcap L.open2 popgrowth) collapsed. instruments for levels equation, Standard _cons polity military. ii) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. iii) Although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 49, and so on.

Table 10 GMM Results with 45-country Sample (Dependent Variable: Adult Literacy Rate)

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
Aid Type	1.55E-10[a]	3.00E-09***	–1.45E-10	1.05E-09	4.55E-09**	3.69E-09***	3.38E-10	4.69E-09***
	(1.39)	(2.90)	(0.24)	(0.63)	(2.14)	(2.65)	(0.98)	(3.88)
ALR Lag1year	0.738***	0.701***	0.742***	0.767***	0.762***	0.718***	0.741***	0.686***
	(15.16)	(17.93)	(13.56)	(16.96)	(18.01)	(13.75)	(13.21)	(18.47)
Polity	0.275***	0.317***	0.274***	0.250***	0.264***	0.301***	0.271***	0.325***
	(4.75)	(4.36)	(4.23)	(4.28)	(4.70)	(3.86)	(3.65)	(5.38)
GDP per Capita	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***	0.0003***
	(5.06)	(4.75)	(4.99)	(5.52)	(5.07)	(4.61)	(6.49)	(5.18)
Openness	–0.042***	–0.058***	–0.038***	–0.036***	–0.038***	–0.044***	–0.038***	–0.047***
	(–5.63)	(–6.18)	(–4.68)	(–4.74)	(–5.50)	(–5.30)	(–4.67)	(–5.73)
Terms of Trade	0.009*	0.004	0.010**	0.008[b]	0.010**	0.014***	0.009*	0.011*
	(1.68)	(0.66)	(1.98)	(1.53)	(2.26)	(2.59)	(1.72)	(1.67)
Inflation	0.016	0.022[a]	0.015	0.014	0.018	0.014	0.016*	0.017
	(1.36)	(1.59)	(1.28)	(1.21)	(1.30)	(0.95)	(1.68)	(1.38)
Population Growth	–2.744***	–2.961***	–2.593***	–2.216***	–2.389***	–2.772***	–2.608***	–3.415***
	(–3.26)	(–3.81)	(–3.12)	(–2.72)	(–2.92)	(–3.77)	(–2.95)	(–4.66)
Military Expenditure	0.132	0.133	0.157	0.196	0.190*	0.199	0.222	0.062

	(0.56)	(0.53)	(0.65)	(1.01)	(0.89)	(0.92)	(1.05)	(0.27)
Observations	452	452	452	452	452	452	452	452
Number of Countries	40	40	40	40	40	40	40	40
AR(2)	0.488	0.580	0.465	0.420	0.507	0.370	0.497	0.499
Hansen over-id Test	0.353	0.420	0.340	0.355	0.364	0.377	0.334	0.303

Notes: i) Instruments for first differences equation. standard D. (polity military); GMM-type (missing=0, separate instruments for each period unless collapsed) L(3/9). (literacy popgrowth gdpcap open aid) collapsed; instruments for levels equation; Standard _cons polity military. ii) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] almost significant at the 16.4% level, [b] almost significant at the 12.5% level. iii) although the sample used contains 45 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 40, and so on.

Table 11 FE Results with 45-country Sample
(Dependent Variable: Age Dependency Ratio or Infant Mortality Rate)

	Age Dependency Ratio		Infant Mortality Rate			
	Aid 1	Aid 7	Total Aid	Aid 1	Aid 6	Aid 7
Aid Type	–4.70E-11***	–8.25E-11***	–7.75E-10	–7.47E-09**	–1.19E-09**	–1.22E-08
	(–3.60)	(–3.11)	(–1.58)[a]	(–2.05)	(–2.01)	(–1.64)[b]
Polity	–0.0006	–0.0008*	–0.600***	–0.564***	–0.598***	–0.605***
	(–1.27)	(–1.66)	(–4.35)	(–4.04)	(–4.33)	(–4.41)
M2	–0.001***	–0.001***	–0.286***	–0.276***	–0.289***	–0.286***
	(–4.99)	(–5.20)	(–4.34)	(–4.21)	(–4.38)	(–4.35)
GDP per Capita	–0.00001***	–0.00001***	–0.002***	–0.002***	–0.002***	–0.002***
	(–5.37)	(–5.32)	(–3.14)	(–2.91)	(–3.14)	(–3.08)
Openness	–0.0008**	–0.001***	–0.127***	–0.118***	–0.131***	–0.127***
	(–5.47)	(–5.87)	(–3.05)	(–2.81)	(–3.13)	(–3.05)
Terms of Trade	–0.00007	–0.0001*				
	(–0.95)	(–1.87)				
Inflation	0.0003***	0.0003***	0.031	0.029	0.030	0.027
	(2.67)	(2.62)	(0.91)	(0.85)	(0.86)	(0.78)

Population Growth	0.071***	0.075***	15.137***	14.726***	15.139***	15.236***
	(11.07)	(11.90)	(9.01)	(8.68)	(9.01)	(9.12)
Military Expenditure	0.038***	0.036***	6.671***	6.796***	6.615***	6.567***
	(8.26)	(7.78)	(5.39)	(5.52)	(5.34)	(5.33)
Observations	450	450	462	462	462	462
Number of Countries	40	40	41	41	41	41
R-sq (within)	0.61	0.61	0.42	0.42	0.42	0.42
R-sq (between)	0.39	0.40	0.22	0.22	0.22	0.23
Hausman Test	0.00	0.00	0.4233	0.4261	0.3589	0.473

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] Almost significant at 11.3% level, [b] Almost significant at the 10.1% level. ii) Although the sample used contains 45 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 40, and so on.

Most of control variables also have significant coefficients with expected signs.

c) Age dependency ratio

Also, from table 11 FE results with 45-country sample are presented. We can see that Aid 1 (Social infrastructure and services), and Aid 7 (Humanitarian aid) have significant effects on age dependency ratio. Most of control variables also have significant coefficients with expected signs.

d) Child mortality ratio

In table 12, FE results with 61-country sample are shown. We can see that Total aid, Aid 1 (Social infrastructure and services), Aid 2 (Economic infrastructure and services), Aid 3 (Production sectors), Aid 4 (Multisector/ cross-cutting), and Aid 6 (Action relating to debt) have a significant impact on child mortality.

e) Maternal mortality rate

According to the FE results with 61-country sample are shown in table 12, we can see that Total aid, Aid 1 (Social infrastructure and services), and Aid 4 (Multisector/cross-cutting) have significant effects on maternal mortality. Control variables like openness, population growth, and military expenditure also have significant effects on both child and maternal mortality rate.

f) Ratio of girls to boys in primary and secondary education

In table 13, FE results with 61-country sample on the ratio of girls to boys in primary & secondary education (‘gender ratio’) are presented. Total aid, Aid 1 (Social infrastructure and services), Aid 2 (Economic infrastructure and services), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have a significant impact on this ‘gender ratio’.

g) Primary completion rate

FE results with 61-country sample on primary completion rate are also

Table 12 FE Results with 61-country Sample

(Dependent Variable: Child Mortality and Maternal Mortality)

	Child Mortality						Maternal Mortality		
	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 6	Total Aid	Aid 1	Aid 4
Aid Type	–1.93E-09***	–1.41E-08*	–9.09E-09***	–6.12E-08**	–4.68E-08**				–3.38E-07*
	(–2.78)	(–1.95)	(–2.92)	(–2.40)	(2.00)				(–1.72)
Aid type Lagged1year	–2.05E-09**	–2.44E-08**	9.74E-09	–1.75E-09	6.94E-09	–2.06E-09[a]	–4.58E-08**	–2.77E-07***	–4.01E-08
	(–2.15)	(–2.60)	(1.03)	(–0.10)	(0.42	(–1.66)	(–2.06)	(–4.28)	(–0.32)
Polity	–0.256	–0.250	–0.366	–0.289	–0.441	–0.593	–2.417	–1.351	–4.933
	(–0.77)	(–0.81)	(–1.01)	(–0.78)	(–1.24)	(–1.20)	(–0.59)	(–0.38)	(–1.20)
M2	–0.386***	–0.203	–0.384**	–0.459***	–0.418***	–0.591***	–0.585	–0.014	–1.471
	(–2.95)	(–1.60)	(–2.62)	(–3.22)	(–2.96)	(–2.83)	(–0.45)	(–0.01)	(–1.16)
GDP per Capita	–0.005***	–0.004***	–0.007***	–0.005***	–0.005***	–0.005**	–0.009	0.0006	–0.003
	(–3.60)	(–2.68)	(–4.05)	(–2.92)	(–3.03)	(–2.31)	(–0.62)	(0.04)	(–0.17)
Openness	–0.183**	–0.132*	–0.174**	–0.172**	–0.175**	–0.275**	–2.031***	–1.628**	–1.667**
	(–2.48)	(–1.89)	(–2.09)	(–2.16)	(–2.20)	(–2.32)	(–2.76)	(–2.60)	(–2.25)
Inflation	0.045	0.147	0.144	0.113	0.100	0.048	0.622	0.530	0.646
	(0.37)	(1.32)	(1.14)	(0.89)	(0.78)	(0.27)	(0.64)	(0.62)	(0.65)
Population Growth	8.435***	7.797***	8.453***	8.957***	8.528***	7.947***	63.227***	57.235***	63.177***
	(4.72)	(4.63)	(4.48)	(4.69)	(4.47)	(3.62)	(4.90)	(5.01)	(4.78)

Military Expenditure	4.116**	2.367	6.379***	4.745**	5.277***	5.015**	26.610	18.130	32.226*
	(2.28)	(1.35)	(3.40)	(2.47)	(2.77)	(2.11)	(1.62)	(1.24)	(1.94)
Cons.	95.588	91.559	89.928	93.377	91.487	115.011	409.846	394.814	390.7583
	(11.31)	(11.72)	(10.08)	(10.27)	(10.09)	(10.04)	(5.35)	(6.00)	(5.02)
Observations	172	172	170	172	172	123	107	107	107
Number of Countries	56	56	56	56	56	47	56	56	56
R-sq (within)	0.5795	0.6319	0.5413	0.526	0.5192	0.5424	0.6023	0.6936	0.5918
R-sq (between)	0.5184	0.4674	0.5197	0.5404	0.5407	0.5979	0.4088	0.3302	0.4317
R-sq (overall)	0.4948	0.412	0.5066	0.5177	0.523	0.5563	0.3998	0.3184	0.4227

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] almost significant at the 10.1% level. ii) Although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 56, and so on.

shown in table 13. Total aid, Aid 1 (Social infrastructure and services), Aid 4 (Multisector/cross-cutting), and Aid 6 (Action relating to debt) show positive and significant effects. Most of control variables also have similar effects on primary completion rate.

h) Employment ratio

FE results with 61-country sample are presented in table 14. Total aid, Aid 2 (Economic infrastructure and services), Aid 4 (Multisector/cross-cutting), and Aid 7 (Humanitarian aid) have a significant and positive impact on employment ratio. GDP per capita and population growth rate also show significant effects on employment ratio.

i) Budget surplus/deficit

FE results with 61-country sample are presented in table 14. We can see that Total aid, Aid 1 (Social infrastructure and services), Aid 4 (Multisector/cross-cutting), and Aid 6 (Action relating to debt) have a significant impact on budget surplus/deficit.

j) Also in table 14, GMM results with 45-country sample and based on 3-year-average data are shown when the dependent variable is PQLI. We can see that Aid 1 (Social infrastructure and services), Aid 5 (Commodity aid and general program assistance), and Aid 7 (Humanitarian aid) significantly affect PQLI.

k) HIV prevalence

FE results for the HIV prevalence is not included in this paper. For this variable, only lagged Aid 1 shows significant effects.

Table 13 FE results with 61-country Sample (Dependent Variable: Ratio of Girls to Boys in Primary and Secondary Education or Primary Completion Rate)

Dependent Variable	Gender Ratio					Primary Completion Rate			
	Total Aid	Aid 1	Aid 2	Aid 6	Aid 7	Total Aid	Aid 1	Aid 4	Aid 6
Aid type	4.91E-10**	8.41E-09***	3.27E-09*			2.19E-09***	1.11E-08***		2.25E-09**
	(2.06)	(5.47)	(1.73)			(3.16)	(3.24)		(3.03)
Aid Type Lagged1year	1.19E-09***	6.22E-09***	2.86E-09*	1.32E-09***	7.55E-09***	2.01E-09***	8.83E-09**	2.22E-08*	2.01E-09***
	(3.46)	(3.32)	(1.87)	(3.49)	(3.57)	(2.88)	(2.06)	(1.78)	(2.79)
Polity	0.021	–0.042	0.050	0.034	0.016	0.080	0.046	0.192	0.122
	(0.27)	(–0.58)	(0.64)	(0.40)	(0.21)	(0.46)	(0.26)	(1.07)	(0.73)
M2	0.226***	0.205***	0.193***	0.423***	0.222***	0.529***	0.492***	0.536***	0.491***
	(6.56)	(6.37)	(5.40)	(8.37)	(6.11)	(7.90)	(7.43)	(7.83)	(5.51)
GDP per Capita	–0.0004	–0.0009**	0.00005	–0.0002	–0.0001	0.002***	0.002**	0.003***	0.003**
	(–0.88)	(–2.16)	(0.11)	(–0.24)	(–0.30)	(2.66)	(2.07)	(2.99)	(2.31)
Openness	0.055***	0.022	0.069***	0.122***	0.073***	0.199***	0.168***	0.212***	0.156***
	(3.12)	(1.33)	(3.77)	(4.58)	(3.94)	(5.92)	(4.93)	(6.20)	(3.73)
Inflation	–0.016	–0.020	–0.020	–0.010	–0.015	0.056*	0.049[a]	0.060*	0.075**
	(–0.94)	(–1.26)	(–1.13)	(–0.51)	(–0.90)	(1.81)	(1.62)	(1.91)	(2.15)
Population Growth	–0.888**	–0.600*	–0.732*	–0.132	–0.743*	–1.708**	–1.302*	–1.602**	–0.781
	(–2.32)	(–1.67)	(–1.86)	(–0.33)	(–1.89)	(–2.27)	(–1.76)	(–2.08)	(–1.13)

Military Expenditure	–1.004***	–0.828***	–1.139***	–1.086***	–1.050***	–1.783***	–1.658***	–2.036***	–1.399***
	(–3.84)	(–3.33)	(–4.24)	(–3.98)	(–3.95)	(–3.41)	(–3.18)	(–3.83)	(–2.90)
Cons.	83.926	85.338	83.759	70.620	82.795	41.953	44.108	41.775	39.511
	(48.43)	(52.62)	(46.80)	(30.00)	(45.86)	(12.53)	(13.36)	(12.17)	(10.05)
Observations	402	402	397	275	380	413	413	413	267
Number of Countries	53	53	53	48	53	55	55	55	46
R-sq (within)	0.3156	0.4013	0.2674	0.4452	0.3097	0.4515	0.469	0.4243	0.377
R-sq (between)	0.087	0.0122	0.1354	0.1136	0.1226	0.3174	0.3042	0.3653	0.4098
R-sq (overall)	0.0775	0.0059	0.1272	0.0822	0.1186	0.3589	0.3294	0.4145	0.424

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] almost significant at the 10.6% level. ii) Although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 53, and so on.

Table 14 FE and GMM Results (Dependent Variable: Employment Ratio or Budget Surplus/Deficit or PQLI)

Dependent Variable	Employment Ratio (FE Model and 61-country Sample)				Budget Surplus/Deficit (FE Model and 61-Country Sample)				PQLI (GMM Model and 45-country Sample)		
	Total Aid	Aid2	Aid4	Aid7	Total Aid	Aid1	Aid4	Aid 6	Aid 1	Aid 5	Aid 7
Aid Type			4.66E-09*		1.90E-09	3.17E-09b	1.18E-08	2.79E-09	8.08E-09*	2.44E-08**	9.84E-09*
			(1.92)		(3.65)	(1.55)	(1.50)	(3.58)	(1.89)	(2.65)	(1.68)
Aid Type Lagged1year	2.66E-10*	7.58E-10a		2.13E-09**		1.02E-09	0.014	–0.108			
	(1.73)	(1.55)		(1.98)		(1.01)	(0.18)	(–1.17)			
Polity	–0.010	–0.002	–0.007	–0.008	–0.002	–0.023	–0.085	–0.204	0.777***	1.304***	0.926***
	(–0.28)	(–0.06)	(–0.23)	(–0.24)	(–0.03)	(–0.31)	(–1.83)	(–2.85)	(3.55)	(4.94)	(4.25)
M2	–0.015	–0.007	–0.005	–0.010	–0.086	–0.092	0.002	0.003***	0.135	0.275**	0.162
	(–0.91)	(–0.45)	(–0.32)	(–0.62)	(–1.90)	(–1.97)	(3.40)	(1.86)	(1.21)	(2.59)	(1.27)
GDP per Capita	0.0006***	0.0007***	0.0006***	0.001***	0.002***	0.002***	0.033***	0.080	0.002*	0.002a	0.001*
	(3.10)	(3.42)	(3.13)	(4.66)	(3.15)	(3.14)	(1.35)	(1.65)	(1.80)	(1.56)	(1.87)
Openness	0.010	0.010	0.011	0.002	0.028	0.031	0.035	–0.039c	0.006	0.055	0.039
	(1.25)	(1.24)	(1.33)	(0.27)	(1.20)	(1.26)	(1.55)	(–0.83)	(0.08)	(0.71)	(0.83)
Terms of Trade									–0.032	–0.010	–0.031
									(–1.47)	(–0.25)	(–1.33)

Inflation	0.011	0.010	0.009	0.016**	0.029	0.033	–0.395	0.816	–0.071	0.076	0.012
	(1.41)	(1.38)	(1.37)	(2.04)	(1.33)	(1.46)	(–0.32)	(0.38)	(–0.64)	(0.84)	(0.15)
Population Growth	0.410**	0.380**	0.107	0.273*	–0.377	–0.232	–0.699	0.069	–7.936**		–7.108**
	(2.52)	(2.34)	(0.78)	(1.74)	(–0.32)	(–0.19)	(–1.18)	(0.09)	(–2.58)		(–2.28)
Military Expenditure	–0.076	–0.112	0.048	–0.105	–0.430	–0.558	–2.910	–3.751			
	(–0.57)	(–0.84)	(0.40)	(–0.83)	(–0.75)	(–0.95)	(–0.83)	(–0.58)			
Cons.	59.522	59.329	59.541	60.568	–3.305	–2.868	0.014	–0.108			
	(74.11)	(73.48)	(78.73)	(78.08)	(–0.97)	(–0.82)	(0.18)	(–1.17)			
Observations	587	576	636	551	274	274	274	178	180	180	180
Number of Countries	57	57	57	57	45	45	45	38	45	45	45
R-sq (within)	0.039	0.0253	0.0375	0.0318	0.134	0.0917	0.0911	0.1717	AR(2): 0.096	AR(2): 0.579	AR(2): 0.252
R-sq (between)	0.0081	0.1383	0.0397	0.042	0.1268	0.1207	0.1315	0.1705	Hansen:0.783	Hansen:0.916	Hansen:0.830
R-sq (overall)	0.0044	0.1173	0.0337	0.0342	0.0873	0.0682	0.0648	0.0967			

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level. ii) See other tables for other notes. iii) [a, b] almost significant at the 12.2% level, [c] almost significant at the 10.2%. iv) for the GMM model, instruments for first differences equation standard D. (polity military enrolpri) GMM-type (missing=0, separate instruments for each period unless collapsed) L(2/.). (pqli popgrowth gdpcap inflation tot L.open polity Aid 1 or Aid 5 or Aid 7), instruments for levels equation Standard _cons polity military enrolpri.; although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 57, and so on.

3.3. Economic Growth

a) GDP growth

In table 15, FE results with the 61-country sample and with GDP growth as dependent variable and FE results with the 45-country sample and with lnGDP as dependent variable are presented together. Total aid, Aid 1 (Social infrastructure and services), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have significant and positive impacts on GDP growth. Control variables like GDP per capita, openness, population growth, and military expenditure rate show significant effects.

b) lnGDP[25)]

From the results shown in table 15, we can see that Total aid, Aid 1 (Social infrastructure and services), Aid 6 (Action relating to debt), and Aid 7 (Humanitarian aid) have significant and positive effects on lnGDP. Other control variables like polity index, M2, GDP per capita, openness, terms of trade, inflation rate, military expenditure, and population growth rate are also significant and positive.

[25)] GMM analysis with the 45-country sample on lnGDP is also tried out. According to the results, Aid 1 (Social infrastructure and services), Aid 5 (Commodity aid and general program assistance), and Aid 7 (Humanitarian aid) have significant and positive impacts on lnGDP.

Table 15 FE Results with 61-country Sample or 45-country Sample (Dependent Variable: GDP Growth or lnGDP)

	GDP Growth (61-country sample)				lnGDP (45-country Sample)			
	Total Aid	Aid 1	Aid 6	Aid 7	Total Aid	Aid 1	Aid 6	Aid 7
Aid type	8.25E-11	1.98E-09*	4.20E-10[a]	-2.40E-09	2.86E-11***	2.85E-10***	4.00E-11***	3.01E-10***
	(0.49)	(1.69)	(1.6)	(-1.34)	(4.15)	(5.70)	(4.80)	(2.89)
Aid type Lagged1year	4.73E-10**	1.46E-09	4.49E-10[b]	6.20E-09***				
	(2.00)	(1.06)	(1.6)	(2.95)				
Polity	0.067	0.058	0.051	0.074	0.006***	0.005**	0.006***	0.006***
	(1.4)	(1.22)	(0.98)	(1.5)	(3.24)	(2.52)	(3.30)	(3.25)
GDP per Capita	0.002***	0.002***	0.001***	0.002***	0.00008***	0.00007***	0.00008***	0.00007***
	(6.38)	(6.02)	(3.45)	(6.53)	(10.17)	(9.74)	(10.30)	(9.59)
Openness	0.051***	0.046***	0.049***	0.047***	0.005***	0.004***	0.005***	0.004***
	(4.4)	(3.97)	(2.97)	(3.83)	(7.57)	(6.91)	(7.86)	(7.44)
Terms of Trade					0.002***	0.002***	0.002***	0.002***
					(6.63)	(7.01)	(6.34)	(8.06)
M2	–0.014	–0.029	–0.030	–0.015	0.005***	0.005***	0.005**	0.005***
	(–0.61)	(–1.27)	(–0.95)	(–0.62)	(5.48)	(5.28)	(5.53)	(5.34)

Inflation	–0.001	–0.0007	–0.020	0.002	–0.0008*	–0.0007[a]	–0.0007	–0.0008
	(–0.13)	(–0.07)	(–1.62)	(0.14)	(–1.69)	(–1.53)	(–1.56)	(–1.57)
Population Growth	0.394*	0.489**	0.504**	0.358[c]	–0.264***	–0.245***	–0.263***	–0.272***
	(1.74)	(2.17)	(2.22)	(1.52)	(–10.68)	(–9.94)	(–10.76)	(–10.95)
Military Expenditure	–0.454**	–0.401**	–0.439**	–0.443**	–0.044**	–0.050***	–0.044**	–0.043**
	(–2.45)	(–2.17)	(–2.34)	(–2.33)	(–2.43)	(–2.82)	(–2.44)	(–2.37)
Cons.	–2.571	–2.141	–0.510	–2.338				
	(–2.3)	(–1.94)	(–0.39)	(–2.00)				
Observations	587	585	388	537	451	451	451	451
Number of Countries	57	57	48	57	45	45	45	45
R-sq (within)	0.1528	0.1586	0.1185	0.1706	0.66	0.67	0.66	0.65
R-sq (between)	0.0264	0.0146	0.0052	0.0267	0.69	0.69	0.69	0.70

Notes: i) * Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level, [a] almost significant at the 11.0% level, [b] almost significant at the 11.1% level, [c] almost significant at the 13.0% level. ii) although the sample used contains 61 countries, not all of these countries have available data on all our explanatory variables, hence the actual number is for example 57, and so on.

4. SUMMARY OF FA′S IMPACT ON ECONOMIC DEVELOPMENT

As we mentioned in the introduction some studies indicate that FA has a positive effect on economic development or growth and some other studies a conditional or negative one. Here our results examined by sub-categories of aid and total FA show significant associations with both qualitative and economic dependent variables. Most of control variables like GDP per capita, openness, population growth, inflation and military expenditure also have significant positive impact (although their coefficient is not always positive; for example military expenditure has a negative coefficient). The summary of results is shown in table 16 where we can see that total FA has a positive impact on all dependent variables except age dependency ratio.

Table 16 Summary of Effects of FA on Economic Development

	Total Aid	Aid 1	Aid 2	Aid 3	Aid 4	Aid 5	Aid 6	Aid 7
HDI	+	+	+	+	+	+	+	+
PQLI	+	+	+		+	+	+	+
Adult Literacy	+	+	+		+	+	+	+
GDP Growth	+	+					+	+
Infant Mortality	+	+					+	+
Age Dependency		+						+
Child mortality	+	+	+	+	+		+	
Maternal Mortality	+	+			+			
Gender Ratio	+	+	+				+	+
Primary Completion	+	+			+		+	
Employment	+		+		+			+
Budget	+	+			+		+	

Notes: + does not represent the signs of coefficients. It means that each category of aid has a positive and significant effect on each dependent variable.

Aid 1 (Social infrastructure and services)

This includes: education, health, population policies/programs water and sanitation, government and civil society, conflict prevention and resolution, peace and security, other social infrastructure and services (from CRS, as explained in table 3).

Aid 1 has significant effects on HDI (FE, GMM), PQLI (FE, GMM with and without primary school enrollment-only the results with primary school are reported here), adult literacy rate (FE, GMM), infant mortality rate (FE), age dependent ratio (FE), child mortality ratio (FE), maternal mortality ratio (FE), ratio of girls to boys in primary and secondary education (FE), primary education complete rate (FE), budget surplus/deficit (FE), HIV prevalence, and economic growth (FE). These results can be justified when we look into the purpose of this FA category.

For instance, when HDI (or PQLI) increase and all mortality rates diminish by increasing Aid 1. This is because Aid 1 has the following purposes; (i) basic and primary health care programs like paramedical and nursing care programs, supply of drugs, medicines and vaccines related to basic health care, (ii) basic health infrastructure like district-level hospitals, clinics and dispensaries and related medical equipment, excluding specialized hospitals and clinics, (iii) basic nutrition like direct feeding programs (maternal feeding, breastfeeding and weaning foods, child feeding, school feeding), determination of micro-nutrient deficiencies, provision of vitamin A, iodine, iron etc., (iv) infectious disease control, (v) health education, (vi) malaria control, (vii) tuberculosis control, (viii) health personnel development, for example, training of heath staff for basic health care services. Also, water and sanitation-related efforts are included in this category of aid.

In addition, adult literacy rate is increased with Aid 1 because of the latter's education-related purposes like (i) education policy and administrative management, (ii) education facilities and training, (iii) teacher training, (iv) educational research, (v) primary education, (vi) secondary education, (vii) post-secondary education.

This particular type of aid turned out to have significant effect on virtually

every dependent variable regardless of estimation method. It can be said that Aid 1 plays the most important role among different categories of aid on the qualitative variables and economic growth examined in this study.

Aid 2 (Economic infrastructure and services)

This includes: transport and storage, communication, energy generation and supply, banking and financial services, business and other services.

Aid 2 shows positive effects on HDI (FE, GMM), PQLI (GMM), adult literacy rate (FE, GMM), child mortality ratio (FE), ratio of girls to boys in primary and secondary education (FE), and employment ratio (FE).

Aid 3 (Production sectors)

This includes: agriculture, forestry, fishing, industry, mineral resources and mining, construction, trade policy and regulations and trade-related adjustment, tourism. This type of aid has significant impacts on HDI (GMM), PQLI (GMM), adult literacy rate (GMM), and child mortality ratio (FE).

Aid 4 (Multi sector/cross-cutting)

This includes: general environmental protection, other multi sector (urban/rural development and management, non-agricultural alternative development, etc.). This type of aid has significant effects on HDI (GMM), PQLI (GMM), adult literacy rate (GMM), child mortality ratio (FE), maternal mortality ratio (FE), primary completion rate (FE), employment ratio (Fe), and budget surplus/deficit (FE).

Aid 5 (Commodity aid and general program assistance)

This includes: general budget support, developmental food aid/food security assistance, other commodity assistance (import support). Aid 5 has significant impacts on HDI (FE, GMM), PQLI (GMM), and adult literacy rate (GMM).

Aid 6 (Action related to debt)

This includes: debt forgiveness, relief of multilateral debt, rescheduling and refinancing, debt for development swap, debt buy-back. This type of aid has significant impacts on most of dependent variables, HDI (FE, GMM), PQLI (FE, GMM) adult literacy rate (FE, GMM), infant mortality rate (FE), child mortality ratio (FE), ratio of girls to boys in primary and secondary education (FE), primary completion rate (FE), budget surplus/deficit (FE), and GDP growth (FE).

Aid 7 (Humanitarian aid)

This includes: emergency response, reconstruction relief and rehabilitation, disaster prevention and preparedness. Aid 7 has significant impacts on HDI (FE, GMM), PQLI (FE, GMM) adult literacy rate (FE, GMM), infant mortality (FE), age dependency ratio (FE), ratio of girls to boys in primary and secondary education (FE), employment ratio (FE), and GDP growth (FE). From Clemens *et al*. (2004)'s point of view, this type of aid is thought to be negatively correlated (our results do not show this negative correlation in all cases) with economic growth because some parts of purposes of this category are focused on functions like emergency response, reconstruction relief and rehabilitation. This means that this type of aid is given to a country which is in emergency, for example, natural disasters, which might have already deteriorated the country's economic growth. However, this category of aid also has other purposes besides emergency responses, that is, disaster prevention and preparedness like disaster risk reduction activities (e.g., developing knowledge, natural risks cartography, legal norms for construction); early warning systems; emergency contingency stocks and contingency planning including preparations for forced displacement as well as emergency response.

Finally it is worth examining Korea's case briefly. This country has become a member of DAC (Development Assistance Committee) since January, 2010. This is the first case that a recipient country changed its position to a donor. To see Korea's efforts as a donor, table 17 shows some descriptive data for 2006-2008.

Table 17 FA Aid Outflows of Korea (2006-2008)

	2006	2007	2008
Aid 1	179.4 (48.8)	277.7 (57.1)	252.1 (46.4)
Aid 2	113.5 (30.9)	126.4 (26.0)	148.6 (27.4)
Aid 3	43.3 (11.8)	47.5 (9.8)	81.3 (15.0)
Aid 4	6.6 (1.8)	17.3 (3.6)	25.1 (4.6)
Aid 5	0.2 (0.0005)	0.3 (0.0006)	1.6 (0.3)
Aid 6	…	…	10.3 (1.9)
Aid 7	24.4 (6.6)	17.1 (3.5)	24.0 (4.4)

Notes: i) All values are in USD million. ii) Numbers in brackets are percentage of each aid to total aid. iii) Data source is Creditor Reporting System (CRS).

Table 18 FA Inflows in Korea (1995-1998)

	1995	1996	1997	1998
Aid 1	1.65 (58.2)	7.71 (79.0)	4.07 (80.6)	3.54 (51.7)
Aid 2	…	…	…	0.32 (4.7)
Aid 3	…	…	…	0.23 (3.4)
Aid 4	0.95 (33.4)	1.26 (12.9)	0.98 (19.4)	0.17 (2.5)
Aid 5	…	..	…	2.6 (37.2)
Aid 6	…	..	…	…
Aid 7	0.24 (8.5)	0.79 (8.1)	…	0.03 (0.5)

Notes: i) All values are in USD million. ii) Numbers in brackets are percentage of each aid to total aid. iii) Data source is Creditor Reporting System (CRS).

According to table 17, Korea provides most of its FA in terms of categories 1 and 2. However, from this table we can see that Korea has diversified overall its FA, which is a good policy given that our findings suggest that all types of aid can be useful. On the other hand, as we can see in table 18, Korea as a recipient, had received mostly Aid 1 type which assisted its economic development.

5. CONCLUSION

Despite studies showing that FA has positive effects on quantitative and qualitative economic growth, there are also many counter arguments on this effectiveness among researchers. In this paper we also provide evidence that total FA has positive effects on all our dependent variables (except age dependency ratio). In addition we examine the impact of FA according to its seven categories on qualitative dependent variables; this contributes to better understanding this impact. Subsequently, this better understanding might improve worldwide efforts for poverty reduction and improving quality of life in less fortunate countries. These efforts can be said to be the ultimate goal of many nations, institutions, scholars, and every concerned agent in development economics and social sciences in general. Developed countries are already aware of the magnitude of their neighbors' poverty and their consequent tragedy so they collectively assist undeveloped countries to improve their standards of living. They further establish many goals related to development and try to achieve them on time in various ways.

Here in this paper we have provided evidence that when we consider separately each one of the seven functional categories of FA, their effects are positive and significant (at least in some cases). Two composite indexes representing quality of life, the Physical Quality of Life Index (PQLI), and the HDI are used as two important criteria measuring effectiveness of FA. Also, several individual indicators are used such as age dependency ratio, gender ratio, maternal mortality, child mortality, infant mortality rate, adult literacy rate, etc in this study. From our results, we can check the hypotheses set out in section 1. The three hypotheses and the validity of each hypothesis are as follows.

i) Total aid and categorized aid are useful for economic development
   This can be checked by looking at both FE and GMM estimation results which examined categorized aid. We can see that aid is useful when qualitative dependent variables are examined. Also, quantitative

economic growth is positively affected by FA.

ii) All types of aid are useful at least for one purpose

Table 16 in section 4 above demonstrates the confirmation of this hypothesis.

iii) There is a conducive environment under which FA might operate in a positive way (such as the presence of adequate polity)

Our control variables of polity, military expenses and others confirm this hypothesis.

Thus, besides different aid categories, the polity index has a significant and positive impact on dependent variables in most of the cases analyzed here. This reflects the importance of political conditions in recipient countries. This relationship between recipients' governance and effectiveness of FA has already been addressed and there are many investigations as part of an effort to reduce corruption. Overall, we can say that political conditions in recipient countries play an important role in terms of effective distribution of FA. GDP per capita is also an important control variable. It has overall the expected sign and it is significant. The effect of openness is not clearly indicated as it differs depending on dependent variables and estimation methods. Terms of trade and M2 have expected signs and are significant in most cases. Inflation rate, population growth rate, and military expenditure are significantly negatively correlated with both qualitative and quantitative variables in most of the cases as expected.

To conclude, for donors to provide a given amount of FA more efficiently, they should look into recipient countries' needs and concentrate on the specialized purpose of FA. In addition, effectiveness of FA ought to be judged by its ability to improve quality of life comprehensively in recipient countries in various aspects, rather than solely by economic growth since the first aim of developmental efforts in terms of FA is to help people in underdeveloped countries to have an 'ordinary' life as far as possible. Our results are promising in terms of FA's positive impact. Therefore, there is a good chance that effectiveness of FA could increase by examining FA

according to categories and highlighting the qualitative consequences. That is, FA and its 7 categories have been rather successful despite the expressed pessimism of some researchers.

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