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# Does Aid Reduce Poverty?

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**Abstract**
Fifty years of literature on aid effectiveness has so far proven inconclusive. Two main challenges still require some attention. The first is to properly identify the causal effect of aid on poverty alleviation. To address it, I exploit differences in the number of years countries have been temporary members of the United Nations Security Council as an instrument for the average amount of economic aid disbursed by the United States. The second is to obtain reliable data on poverty, which I confront by using multidimensional poverty data from the Oxford Poverty and Human Development Initiative (OPHI). For a sample of 64 developing countries, I estimate a significant relationship between higher amounts of aid received during the period 1946–1999 and lower Multidimensional Poverty Index (MPI) between 2000 and 2014. On the contrary, the relationship does not seem to be significant when poverty is measured from an income perspective. Alternative measures of poverty could help improve the understanding of the relationship between development aid and poverty alleviation and might also contribute to improved targeting for aid disbursements.

**Keywords:** multidimensional poverty; aid; sustainable development; security council

**JEL Classification:** O11, F35, I3, H5

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# 1 Introduction

Whether aid contributes to a reduction in poverty among recipient countries is a debate that has been on the table for over fifty years.[1] From seminal theoretical works, such as those of Chenery (1967) and Bacha (1990), to the most recent empirical ones, such as Clemens et al. (2012) and Galiani et al. (2017), the analysis of the effectiveness of aid has not yet produced conclusive results.

However, the relevance of this research question has been growing in recent years. The United Nations' Sustainable Development Goals (SDGs) seek to achieve one of the most ambitious goals: 'End poverty in all its forms everywhere' by 2030 (United Nations, 2015). And to attain this, the international community has emphasised the need to reorient poverty-fighting support through a better allocation of Official Development Assistance (ODA) flows (World Bank, 2015). But, despite the enormous amount of aid that the developing world has received (almost US$1 billion on average since 1960), income poverty still represented 14.5% of the world's population in 2011 (World Bank Group, 2014) and multidimensional poverty affects around 30% of people around the globe (Alkire et al., 2016). Therefore, will more aid contribute to reduce poverty?

In the present article, I seek to answer this question by closing two gaps left open in previous studies. First, the standard relationship that has widely been analysed in the literature is the one between aid and growth, mainly due to the lack of reliable data on poverty in developing countries. Nonetheless, the link between poverty and economic growth is not direct (Bourguignon, 2004). And, although countries' economies need to grow to alleviate poverty, the power of economic growth is limited, particularly when poverty is measured from a multidimensional perspective (Santos et al., 2017). Hence, analysing the effect of aid on poverty reduction through economic growth does not consider other social factors that indeed affect the well-being of people, such as education, health and quality of life among others (World Bank, 1998). I intend to close this gap by using the new and original database on multidimensional poverty from the Oxford Poverty and Human Development Initiative (OPHI)[2], which provides information about the different forms of deprivation poor people can experience. In particular, I consider the 10 indicators of the global Multidimensional Poverty Index (MPI), and compare MPI results to poverty measured from a monetary perspective. This way, I am able to directly focus on the aid-poverty relationship.

[1] For an extensive review of the literature see White (1992), McGillivray et al. (2006) and Clemens et al. (2004).
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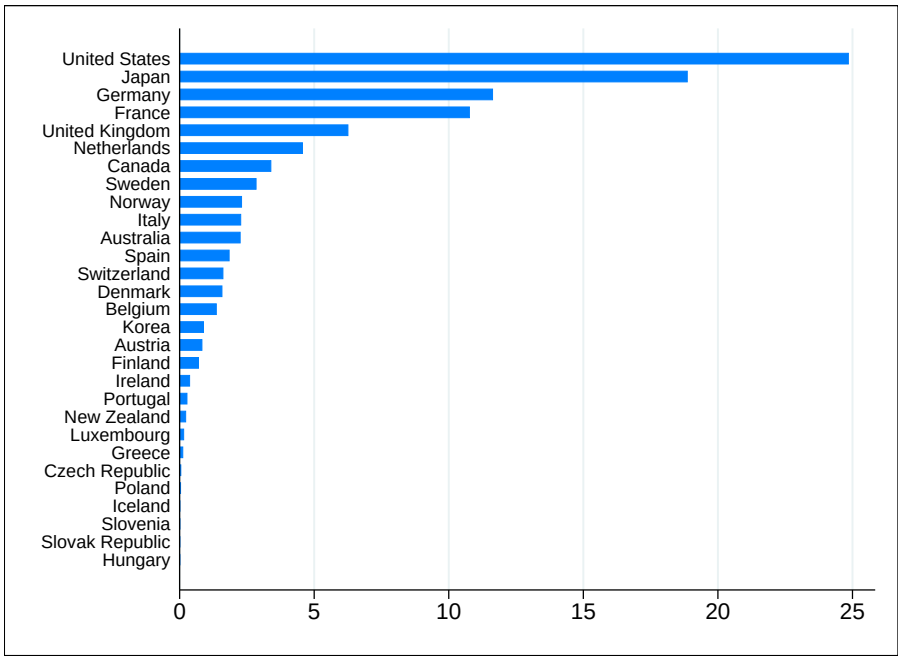
The second gap concerns the empirical strategy used to analyse this relationship. Because lower growth (and higher poverty) might attract more aid, it is difficult to disentangle the causal direction between these two variables. This creates a problem of reverse causality that prevents researchers from properly identifying the causal effect of aid on economic growth (and poverty alleviation). Previous studies, such as Boone (1996), Burnside and Dollar (2000), Rajan and Subramanian (2005) and Clemens et al. (2012) have tackled this issue by using lagged values of aid as instrumental variables of current ones. However, empirical results diverge among these studies, and, considering that poverty levels do not change drastically in the short run, past levels of aid may still introduce some endogeneity bias in the estimations. More recently, Galiani et al. (2017) have addressed this challenge by using the income threshold criterion for aid allocation set by the International Development Association (IDA) as an instrument of the endogenous foreign aid variable and have found that a one percentage point increase in the aid to Gross National Income (GNI) ratio raises per capita GDP growth by 0.35 percentage points on average. Nonetheless, the analysis still focuses on the aid-growth relationship and does not address the impact of aid on poverty reduction.

I aim to complement this literature by using a new instrument of aid disbursements. I exploit differences in the number of years countries have been temporary members of the United Nations Security Council (UNSC) as an instrument for the average amount of economic aid disbursed by the United States between 1946 and 1999. Hence, I only consider the intensive margin, that is, countries that have spent at least one year as a temporary member of the UNSC during that period. Previous work from Kuziemko and Werker (2006) shows that rotating onto the council during the period 1946–2001 has contributed to a 59% increase in the amount of U.S. aid the country has received. Moreover, the authors prove that the effect is particularly pronounced during key years for international diplomacy, suggesting that aid was indeed not due to an increase in attention to a country's needs.

Using cross-section data for 64 developing economies, this article analyses the relationship between the average amount of aid received by a country from the United States over the period 1946–1999 and average poverty levels between 2000 and 2014. There are four main reasons to focus on this empirical strategy. First, the multidimensional poverty data source is only available from 2000 onward. Second, if poverty levels are assumed to have declined in the last three decades (United Nations, 2009), average poverty over the period 2000–2014 would be less likely to explain selection into the council between 1946 and 1999. Third, it is particularly interesting to exploit aid data that was not directly intended for development purposes since this, together with the second argument, supports the choice of instrument.

**Figure 1: ODA Gross Disbursements 1967–2016 (% of total ODA from DAC countries)**




**Source:** OECD Development database

Finally, focusing on aid flows coming exclusively from the U.S. enables this study to consider aid data since the creation of the UNSC in 1946, compared to other aid sources – such as ODA – that started in the 1960s. Since the U.S. is indeed the main donor among the donor pool of the Development Assistance Committee (DAC) (figure 1), I am confident of the external validity of the results.

The results obtained from this study suggest that a country received 14.6% more aid from the U.S. on average during the period between 1946 and 1999 when rotating onto the council for at least one additional year and that, despite their low transparency, these flows seem to be significantly related to lower multidimensional poverty on average over the period 2000–2014. In particular, I find that a 1% increase in the average amount of aid received is associated with a 0.61% reduction in the MPI — on average within the sample. When disentangling the associations among the three dimensions considered in the MPI (education, health, and living standards), results suggest that an average increase of 1% in U.S. aid is related to a lower percentage of multidimensionally poor people deprived in education, health and living standards by 0.82%, 0.36% and 0.64%, respectively. On the other hand, I do not observe a significant relationship between aid from the United States and income poverty, measured here by the percentage of the population whose income is below the threshold of $1.90/day (extreme poverty) and $3.10/day (non-extreme poverty) as well as the intensity of poverty.

These results are robust to a wide range of specifications, including alternative measures of institutional quality, additional relevant control variables such as the share of U.S. aid over the total aid received by the country and the percentage of government consumption to GDP, as well as when considering whether the country is endowed with natural resources or not.

The relevance of these results parallels the use of alternative measures of poverty, such as the MPI, which could help improve the understanding of the relationship between aid and poverty alleviation, other than through economic growth – which has been the primary tool of analysis in previous studies. Moreover, these results might also help to reorient aid disbursements if poverty in all its forms shall be ended everywhere by 2030.

The rest of the paper is organised as follows. Section 2 briefly reviews the empirical literature on aid effectiveness and several works on the determinants of aid on which this paper is based. Section 3 presents a data description and summary statistics. Section 4 introduces the instrument. Section 5 presents the empirical strategy and baseline results. Section 6 reports a battery of robustness checks. Section 7 concludes.

## 2 Literature Review

The rather large literature on aid effectiveness has been developed over the last fifty years and has mainly focused on the impact of development aid on economic growth in less developed countries. It can be chronologically classified into three groups: 'it works; it doesn't; it can, but it depends...' (McGillivray et al., 2006). The first two characterise empirical works between the 1960s and the 1990s, which were mainly based on the Harrod-Domar/Financing Gap model and its extensions that included a foreign exchange gap (Chenery, 1967) and a fiscal gap (Bacha, 1990; Taylor, 1991). They mainly aimed at analysing whether the theoretical macroeconomic impact of aid could indeed be found in the data.However, despite the fact that the amount of aid actually exceeded the amount predicted by these theories,[3] economists observed that anticipated growth was not achieved (White, 1992) and the results obtained generated a huge controversy. Results were inconsistent, with positive *and* negative relationships and even no relationship found between foreign aid and economic growth.[4] Moreover, the controversy was also exacerbated by the presence of a paradox between the

[3] Aid has grown dramatically in the post-war period, increasing by 4.2% per annum in real terms during the period from 1960 to 1988, to reach nearly US70 billion dollars by 1988. In 1988 prices and exchange rates, almost US1.4 trillion (thousand billion) dollars has been disbursed during the last three decades

[4] For an extensive review of the literature see White (1992), McGillivray et al. (2006) and Clemens et al. (2004).

positive results summarised at the micro-level and the ambiguous evidence at the macro-level, the micro-macro paradox (Mosley, 1987; White, 1992).

The publication of the World Bank (1998) report and the subsequent Burnside and Dollar (2000) work marked a turning point and a new wave of aid effectiveness studies emerged by the early 2000s, such as Collier and Dehn (2001), Collier and Hoeffler (2004) and Collier and Dollar (2002). These works not only introduced an innovative macro-econometric framework of analysis by addressing the endogeneity of aid through lagged disbursements but they also dealt with non-linear effects and found support for a conditional effect of aid on growth according to the policy regime of the recipient country. This result was indeed widely discussed and studies were then divided between those that concluded that the allocation of aid should be contingent on a sound institutional environment and those that did not arrive at this conclusion. In the latter category we can find works such as Dalgaard and Hansen (2001), Hansen and Tarp (2001), Lensink and White (2001), Easterly et al. (2004) and Roodman (2007).

New controversies stimulated the development of several alternative explanations such as the need to account for the negative and significant impact of uncertainty (as measured by the instability of aid receipts) on economic performance in order to find a positive effect of aid on growth, mainly due to its effect on investment (Lensink and Morrissey, 2000); climate-related circumstances that can either enhance the positive impact of aid on growth (Guillaumont and Chauvet, 2001) or diminish it (Dalgaard et al., 2004); the conditionality of aid effectiveness on political stability and good institutional quality (Chauvet and Guillaumont, 2004; Islam, 2005; Burnside and Dollar, 2004; Acemoglu and Robinson, 2012)[5] and the presence of diminishing returns to foreign aid beyond a certain threshold (Durbarry et al., 1998; Lensink and White, 1999; Hansen and Tarp, 2001; Dalgaard and Hansen, 2001; Islam, 2005)[6].

More recently, Clemens et al. (2004, 2012) argue that aid flows should not be considered in an aggregate manner (as in all previous studies) since significant portions of aid are unlikely to have an impact on growth over the short period usually considered (four years). By analysing

[5] Acemoglu and Robinson (2012) highlight that countries failing to liberalise markets or move towards democracy typically have a greater need for aid. Thus, they will either receive as much aid as those that do meet the conditions or the amount of additional foreign aid will not be worth the risk for the leaders of the extractive institutions who stand to lose their continued dominance over the country. In any case, conditionality would not be the best answer to reduce poverty around the world but perhaps structuring foreign aid in order to bring external groups into the decision-making process of economic development would help.

[6] Absorptive capacity limits differ among the empirical studies, occurring between 5.5% (Dalgaard and Hansen, 2001) and 50% of aid to GDP (Lensink and White, 2001) with an average level of 20.7%. For an extensive review of these results see Table A1 of the Appendix on Feeny and McGillivray (2011)

the early impact of aid flows (which accounts for about 53% of all aid flows) on economic growth, they find a positive relationship (with diminishing returns) between these two variables. Moreover, their main results are not actually affected by the quality of institutions and policies, as previous studies have found, but the impact on growth seems larger in countries with better institutions or better health (as measured by life expectancy). Rajan and Subramanian (2005) extend previous studies and examine the robustness of the aid-growth relationship across different time horizons (medium and long run), periods (1960s through 1990s), sources of aid (multilateral and bilateral), types of aid (economic, social, food, etc.), timing of impact of aid (contemporaneous and lags varying from 10 to 30 years) and specifications that use both cross-sectional and panel databases with samples that both include and exclude outliers. All in all, the authors' central conclusion is that aid does not impact economic growth, and they find this result robust to different time horizons, time periods, cross-section and panel contexts and different types of aid.

At this stage, and as far as this paper is concerned, all the aid-effectiveness studies have focused on the aid-growth relationship, assuming that higher growth would lead to lower poverty levels. However, the controversial effect of aid on economic growth should not be taken to mean that aid is ineffective for poverty reduction. Instead, empirical work should focus on the aid-poverty relationship (Feeny and McGillivray, 2011). To our knowledge, the only study that has focused on this link is the one by Yontcheva and Masud (2005). The authors analysed the impact of NGO and bilateral aid on human development indicators. Their main findings suggest that NGO aid significantly reduces infant mortality whereas bilateral aid does not seem to play a significant role due to its fungible character, meaning that non-aid-financed government expenditures (health and education, in particular) decline as bilateral aid increases. This, in turn, cancels the potential effect that bilateral aid may have in reducing infant mortality.

Moreover, the new development agenda calls for alternative ways of measuring poverty. With this purpose, OPHI builds data on multidimensional poverty by considering three dimensions of poverty: education, health and living standards.[7] The MPI and its components have been published since 2010 and cover more than 100 developing countries. The construction of this index is done using the Alkire-Foster methodology, which identifies the set of indicators in which each person is deprived at the same time and summarises their poverty profile in a weighted deprivation score (Alkire and Foster, 2011; Alkire et al., 2017). Their findings are that, on average, 30% of people are MPI poor, that is, 50% more than income

[7]For further information, please refer to the Data section.

poor people using the $1.90/day poverty line (Alkire et al., 2016).

Santos et al. (2017) use this database to analyse the relationship between economic growth and income and multidimensional poverty. Their findings suggest that there exists a significant association between the three variables but that the impact of growth on reducing multidimensional poverty is far lower than its impact on reducing income poverty: 'growth does not seem to be particularly pro-poor when poverty is measured from a multidimensional perspective'. They conclude that although countries need to grow in order to reduce poverty, economic growth does not result in large reductions in poverty.

Overall, one of the main lessons that it is drawn from the last 50 years of aid effectiveness is that empirical results do not converge and there is still lot of controversy on the effect of aid on poverty alleviation (and on growth). The main challenge is the endogeneity bias that occurs due to reverse causality between poverty (and growth) and aid.[8] As previously highlighted, the way that many studies have tackled this problem has been by using contemporaneous aid as an instrument for past disbursements. However, considering that poverty levels do not change drastically in the short run, past levels of aid may still introduce endogeneity bias in the estimations. As Clemens et al. (2012) highlight 'the aid-growth literature does not currently possess a strong and patently valid instrumental variable with which to reliably test the hypothesis that aid strictly causes growth.'

Recent research by Galiani et al. (2017) supports the conclusion that 'identification of the causal effect of aid on growth has been elusive so far due to foreign aid being endogenous in growth models. An instrumental variable is needed to address these problems'. To analyse the impact of aid on growth, the authors use data on the eligibility for aid from the International Development Association (IDA). Their results suggest that aid, as a share GNI, drops 59% when a country crosses a per capita income threshold. They focus on 35 countries between the period from 1987 to 2010, and they find that a one percentage point increase in the aid/GNI ratio raises per capita economic growth by 0.35 percentage points on average.

Kuziemko and Werker (2006) provide some insight on a potential, and yet not largely exploited, instrument for foreign aid. They analyse the impact of being elected onto the UNSC on aid disbursements from the United States during 1946–2001. The authors find that the amount of U.S. aid received by a country during that period increased by 59% when it rotated onto the council. Moreover, this effect is more pronounced during key years for international diplomacy. They also find a smaller but still significant increase in aid given by the

[8] Higher poverty (and lower growth) should attract more aid. It is thus difficult to disentangle the causality relationship between aid and poverty reduction (and economic growth).

United Nations through UNICEF, an organisation over which the United States has exerted great control. Their conclusions highlight the political and even *less transparent* character of U.S. aid flows since the creation of the United Nations and until the launch of the Millennium Development Goals (MDGs).

Along these lines, Meernik et al. (1998) analyse the role played by three different goals of U.S. foreign policy on the amount of aid distributed during and after the Cold War through an analysis of a panel data set of 127 countries between 1977 and 1994. These goals are systemic security, such as the U.S. overseas military presence; the protection of U.S. allies and the containment of communism; societal economic objectives, such as the protection and expansion of trade and the promotion of open markets abroad; and statist ideological purposes such as promoting democracy, encouraging a respect for human rights and promoting economic development abroad. Although the authors find all three approaches to be relatively important during the Cold War, they show that there has been a shift from security-driven goals towards the ideological ones after the Cold War. Thus, they provide empirical evidence of a change in the intentions of U.S. foreign aid from strategic and diplomatic needs to development promotion in the aftermath of the Cold War.

Considering then that aid disbursement from United States before the 2000s was mainly politically motivated and probably lacking in transparency, this article intends to exploit this data and contribute to the aid-effectiveness literature by analysing the relationship between aid and poverty alleviation.

# 3 Summary Statistics

This study focuses on the impact of average U.S. aid for the period 1946 to 1999 on average values of poverty from 2000 to 2014. The dynamic constraint is related to data on multidimensional poverty, which is available from 2000, for only a few years, and, in some cases, there exists just one observation per country. Survey years for income poverty also differ across countries and across measures. Following Kuziemko and Werker (2006), I only consider developing countries that have at least spent one year as a temporary member of the UNSC during the period from 1946 to 1999. I match these countries with available data on multidimensional poverty, and end with a group of 64 developing countries, for which I build a cross-sectional database.[9] The sample includes 8 countries from Asia, 6 from Eastern

[9]Refer to table B.5 in the Appendix for detailed information on the survey years for multidimensional and income poverty by country and region, as well as the total number of years at the council and average aid

**Table 1: Summary Statistics of used variables**

| Explicative Variables | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| **Main endogenous explicative variable (avg 1946–1999)** | | | | | |
| Economic U.S. aid, millions | 64 | 143.7 | 303.5 | 1.6 | 1,948.7 |
| **The instrument (sum 1946–1999)** | | | | | |
| Total N° years at the UNSC | 64 | 3.8 | 2.9 | 1.0 | 16.0 |
| **Quality of Institutions** | | | | | |
| Polity2 (avg. 1946–1999) | 64 | -1.6 | 5.1 | -8.2 | 10.0 |
| Political Rights (avg. 1972–1999) | 64 | 4.6 | 1.5 | 1.0 | 6.9 |
| Civil Liberties (avg. 1972–1999) | 64 | 4.5 | 1.1 | 1.8 | 6.9 |
| Ethnic fractionalisation (1 year in 1979–2001, country specific) | 63 | 0.6 | 0.2 | 0.0 | 0.9 |
| Language fractionalisation (1 year in 1979–2001, country specific) | 63 | 0.5 | 0.3 | 0.0 | 0.9 |
| Religious fractionalisation (1 year in 1979–2001, country specific) | 64 | 0.4 | 0.3 | 0.0 | 0.8 |
| **Growth and size of the country (avg. 1960–1999)** | | | | | |
| Annualised per capita GDP growth (constant 2010 US$), % | 64 | 0.8 | 1.9 | -7.2 | 4.6 |
| Population Density | 64 | 65.2 | 96.5 | 1.3 | 652.3 |
| Per capita GDP (constant 2010 US$) | 64 | 2,448.3 | 3,156.9 | 263.3 | 16,394.7 |
| Trade (as % GDP), % | 64 | 58.4 | 29.3 | 13.5 | 147.4 |
| **Public consumption & relative size of aid received (avg 1960–1999)** | | | | | |
| Government Consumption (as % GDP), % | 63 | 14.4 | 5.3 | 6.0 | 31.8 |
| U.S aid (as % total received), % | 60 | 24.6 | 18.5 | 2.1 | 80.4 |
| **Dependent Variables (avg 2000–2014)** | | | | | |
| MPI, % | 64 | 19.5 | 17.2 | 0.0 | 62.3 |
| Multidimensional Poverty HR, % | 64 | 36.2 | 28.9 | 0.0 | 90.8 |
| Income Poverty Gap ($PPP3.10/day), % | 58 | 21.3 | 17.3 | 0.1 | 66.7 |
| Income HR ($PPP3.10/day), % | 58 | 46.2 | 30.0 | 0.1 | 94.5 |
| Income HR ($PPP1.90/day), % | 58 | 21.3 | 17.3 | 0.1 | 85.6 |
| Income Poverty Gap ($PPP1.90/day), % | 58 | 10.8 | 11.2 | 0.0 | 51.4 |

**Notes:** HR stands for headcount ratio. As explained variables, we also analyse the 10 indicators that compose the MPI and whose descriptive statistics are available in Table B.3 of the Appendix: years of schooling, child school attendance, child mortality, nutrition, electricity, improved sanitation, drinking water, flooring, cooking fuel and asset ownership.

Europe, 14 from Latin America and the Caribbean, 3 from the Middle East, 3 from North Africa and 30 from Sub-Saharan Africa. Table 1 gives descriptive statistics of the main dependent and explicative variables used in the study.[10]

## 3.1 Main dependent variables

The main dependent variables that are analysed are the MPI, which is transformed into a percentage for easier comparison across alternative measures; the multidimensional poverty (censored) headcount ratio; the income poverty gap and income headcount ratio at $1.90/day (PPP) and $3.10/day (PPP), which are comparable to the MPI and the headcount ratio for multidimensional poverty, respectively (Santos et al., 2017). The study also analyses the 10

received from the U.S.

[10]Table B.2 in the Appendix gives detailed information about the data, description and sources and table B.4 provides the correlation matrix.

indicators of the MPI.[11] Multidimensional poverty data is from OPHI.[12] Income poverty data is from the World Development Indicators database.

The MPI captures the severe deprivations that people face in three dimensions of poverty: education, health and living standards.[13] The deprivation score for each person is constructed based on a weighted average of the deprivation they experience in each indicator, and the person is considered multidimensionally poor if the deprivation score meets or exceeds the 33.33% threshold. The global MPI covers 110 countries and 5.4 billion people. On average, 30% of people are MPI poor, that is 50% more than income poor people using the $1.90/day (PPP) (Alkire et al., 2016).

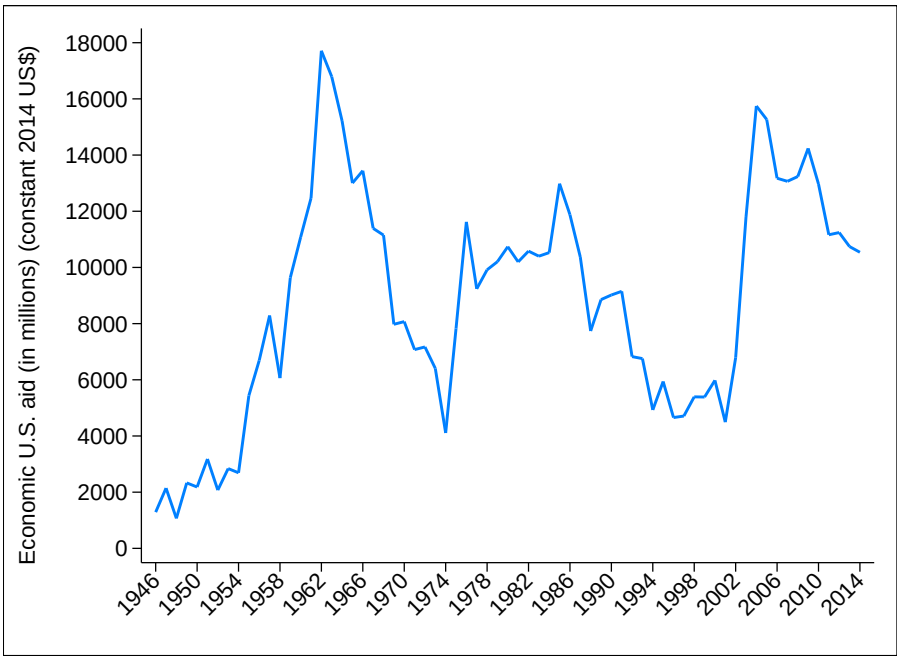
## 3.2 Endogenous explicative variable

Data on U.S. economic aid is extracted from the "Greenbook", which is the U.S. Overseas Loans and Grants database complied by the U.S Agency for International Development. Contrary to Kuziemko and Werker (2006), I only consider economic aid disbursements[14] and not military aid in order to focus the analysis on the role of aid intended for development[15]. U.S. data on aid is available since the creation of the United Nations in 1946. Thus, by using it, I am able to consider the total amount of economic aid given by the United States before the 'formalisation' of development assistance in the 1960s.[16]

Also, by using U.S. aid during the 1946–1999 period, I consider specific and politicised disbursements that were characterised by diplomatic decisions on international security (Meernik et al., 1998; Kuziemko and Werker, 2006), whereas the implementation of the MDGs in 2000 reoriented the aid strategy toward the countries with the greatest needs (Radelet, 2004). Figure 2 shows the evolution of U.S. economic aid towards developing countries between 1946 and 2014.

[11] Details of these indicators are given in table B.1 of the Appendix.
[12] For further information, please visit their website at http://www.ophi.org.uk/. Data is extracted from Table 7 'All Published MPI Results since 2010'.
[13] Table B.1 gives a detailed description and the cutoffs for each indicator considered in the MPI, and table B.3 provides the summary statistics.
[14] Only positive values of aid are considered, thus gross disbursements.
[15] This aid is classified within different purposes such as 'economic and security support assistance', 'food for education', 'refugees and migrations' and 'global health and child survival' to name a few. Therefore, it encompasses the whole amount of development aid given by the United States to each developing country.
[16] Although the study only considers U.S. aid as the main explicative variable, robustness of results is tested by adding the share of U.S. aid over the total official development assistance (ODA) received by each country over the 1960–1999 period (in %) as a control.

**Figure 2: Aid to countries in the sample**



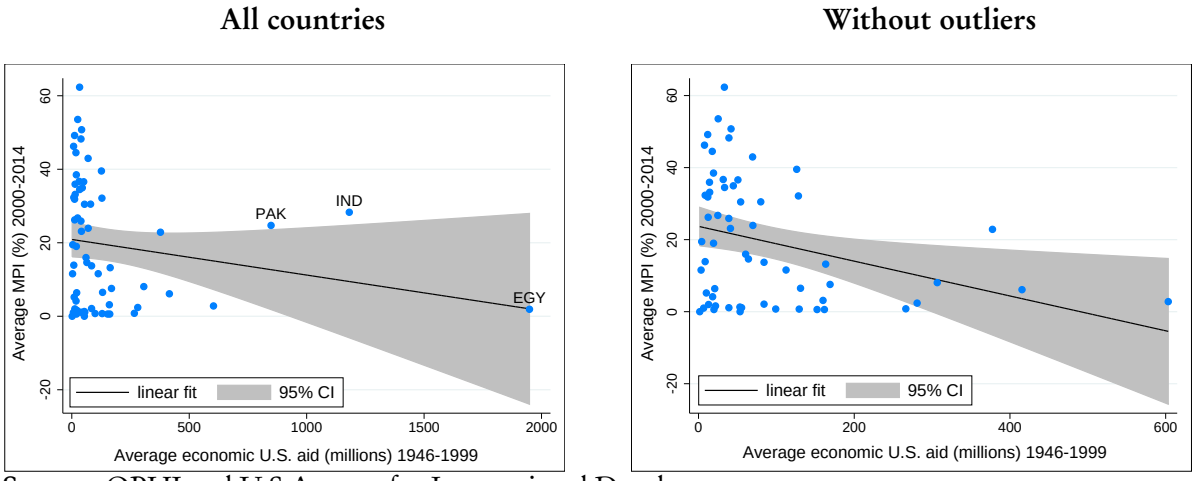

**Source:** U.S Agency for International Development

The first big increase in the aid program was in 1955, when Dwight D. Eisenhower became President of the United States and the Warsaw Pact was founded in Eastern Europe as a Communist military counterpart to NATO. Foreign aid from the U.S. starts to decrease and reach its first low in 1973, during the first oil crisis, then rises again before decreasing again in the 1990s. The main reasons for this decline that are stated in the World Bank (1998) report are increased control of fiscal deficits among OECD countries, the end of the Cold War and the rapid increase in private flows to developing countries. Flows reached their second low in 1997 before increasing drastically after the publication of the World Bank (1998) report and the implementation of the MDGs by the United Nations. Indeed, the main findings of this report underlined the importance of sound policies, institutions and economic management as key factors for aid effectiveness. Acknowledging the large decline in aid flows during the 1990s, the authors of the report firmly encouraged continued aid from the donor community, claiming that the 'climate for effective aid is the best that it has been in decades'.[17]

Figure 3 shows the relationship between the amount of U.S. aid received and the MPI. There

[17]Pp. 2 and 3 of the report state that a '$10 billion increase in aid would lift 25 million people a year out of poverty – but only if it favors countries with sound economic management' and 'there have been sharp improvements in governance and policies in the past decade, but further reform of the same magnitude would lift another 60 million people a year out of poverty'.

**Figure 3: U.S. economic aid and MPI**




**Source:** OPHI and U.S Agency for International Development
**Note:** country abbreviations are for Pakistan (PAK), India (IND) and Egypt (EGY).

are three outliers that seem to diminish the relationship between these two variables. Egypt, India and Pakistan have all three received significantly high amounts of U.S. aid, but Egypt registers a relatively low level of poverty whereas India and Pakistan have relatively high levels of poverty. Nonetheless, when controlling for these outliers, there seems to exist a negative and relatively high correlation between the amount of U.S. economic aid received and the level of multidimensional poverty of the country (-0.32).[18]

## 3.3 Potential macroeconomic determinants of poverty

Building on previous literature (Dalgaard et al., 2004; Burnside and Dollar, 2000; Lensink and White, 2001; Santos et al., 2017; Kuziemko and Werker, 2006), three sets of controls are used: quality of institutions, growth and size of the country, and public consumption and relative size of aid received.

The main measure of political and institutional quality is the polity 2 variable from the Polity Project of the Center for Systemic Peace (Marshall et al., 2017). Its score ranges from -10 to +10, and it examines qualities of democratic and autocratic authority in governing institutions that span from fully institutionalised autocracies (-10 to -6) to fully institutionalised democracies (+6 to +10), with an intermediate and mixed authority regime called anocracy (-5 to +5). As alternative measures of institutional quality I have used Political Rights and

[18]The outliers with respect to the income poverty-aid relationship are India and Pakistan (there is no data on income poverty for Egypt) (figures A.1 and A.2 in the Appendix).

Civil Liberties from Puddington and Roylance (2016). The ratings range between 1 for the most free conditions and 7 for the least free, and they assess the real-world rights and freedoms enjoyed by individuals rather than government performance.[19]. Other variables of political economy that are used are ethnic, language and religion fractionalisation, constructed and provided by Alesina et al. (2003). These measures represent the proportion (between zero and one) of each respective fragmentation within the population. The higher the percentage is, the higher the fragmentation.

Proxies for economic growth and the size of the country include population density, per capita GDP, per capita GDP growth and trade (as % of GDP). Data is drawn from the World Development Indicators (WDI) database. These control variables are not only relevant as potential poverty determinants, but also as potential factors explaining selection into the council. Therefore, controlling for these variables should reinforce the exclusion restriction condition for the validity of the instrument that I use. Finally, and as a robustness check, I include in the main equation the ratio of U.S. aid over the total amount of aid received by the country (OECD database) in order to control for its relative size and the potential crowd in/out effect on the amount of aid coming from other countries. I also test robustness by controlling for government consumption (as % of GDP) from the WDI database, as a proxy of public consumption and a factor that may affect the effectiveness of development aid (see for instance Addison and Tarp (2015).

# 4 The Instrument

Ten out of fifteen seats of the UNSC are held by rotating members serving two years. The other five are the permanent seats of the Russian Federation, France, the United States, the United Kingdom and China. Potential reasons lying behind the assignment of a temporary seat may be to increase attention to a country's needs, greater integration in the international community by the chosen country or as vote trading for political or financial favours. Kuziemko and Werker (2006) have intensively analysed these reasons for the period from 1946 to 2001 for a group of 83 developing countries and have found that some countries served during uneventful years while others did so during debates about key resolutions, i.e. when the vote of the elected country was more valuable: '(...) correlation is being driven by an unobserved, secular change in a country's international influence or diplomatic savoir faire'. Further, the authors find that the amount of U.S. aid that a country receives increases

[19]See Puddington and Roylance (2016) for further information about these variables.

sharply (by 59%) when it is elected into the UNSC and returns to previous levels upon completion of two-year term: 'the rapid return (…) suggests that aid is not due to a new-found awareness of the country's need'.

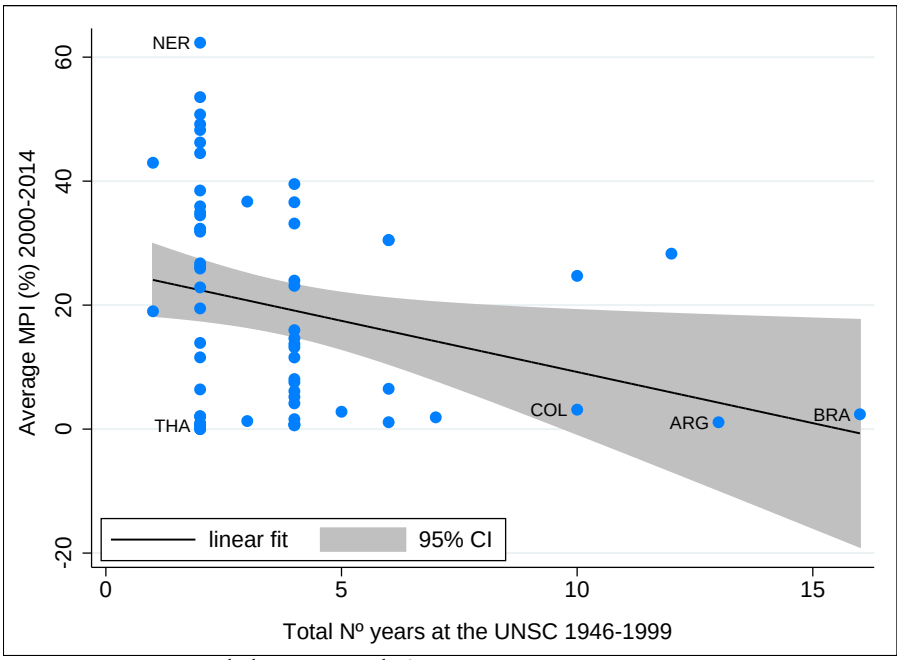
This is relevant to this study since one of the main assumptions in the instrumental variable method is the absence of a relationship between the instrument and the outcome other than through the first-stage channel (effect of instrument on the endogenous explicative variable) (Angrist and Pischke, 2008). This statement is called the *exclusion restriction* and has two parts: the first is the statement that the instrument is as good as randomly assigned (i.e., conditional on covariates, it is independent of the outcome) and the second is that the instrument should not be related to any other potential determinant of the dependent variable that remains unobserved (i.e., that the instrument is uncorrelated with the error term).

Indeed, one may think that selection into the council might be driven by the degree of development of the country – and thus by the level of poverty – so that poorer countries would tend to have a lower probability of rotating into the council. Assuming that income poverty levels have declined in the last three decades (United Nations, 2009), average poverty during the period from 2000 to 2014 would be less likely to explain selection onto the council between 1946 and 1999. Therefore, by design, we should not have any reason to believe that the outcome might explain the instrument. At the same time, being elected as a temporary member of the UNSC should not contribute to reduce poverty levels by itself. It might influence poverty levels – and this is what this study would like to find in the reduced-form relationship – but only if the country received additional funding as a consequence of being elected and this has, in turn, contributed to a reduction in poverty in the country (i.e., that there exists a relationship between the instrument and the outcome but only through the first-stage channel).

To better understand the relationship between poverty and years spent on the UNSC, I plot both variables in figure 4. Most of the countries in the sample have spent less than five years on the UN security council during the period from 1946 to 1999 but they nonetheless present large differences in their levels of MPI. For instance, Niger and Thailand have both spent two years (one service) at the UNSC but Niger presents an average MPI of 62.33%, whereas Thailand's is 0.60%. Moreover, we notice that the potential negative relationship between the instrument and the outcome is particularly led by three countries: Brazil, Argentina and Colombia. All three of them are the countries that have spent the most years on the UNSC and have enjoyed low levels of multidimensional poverty in the last decade.[20] Despite not

[20]Similar observations are drawn from the income poverty gap (at $1.90/day and $3.10/day) and UNSC rela-

**Figure 4: Multidimensional poverty and service on the UNSC**




**Source:** OPHI and the U.N website
**Note:** country abbreviations are for Niger (NER), Thailand (THA), Colombia (COL), Argentina (ARG) and Brazil (BRA).

having data for multidimensional poverty for the period from 1946 to 1999, there are strong reasons to believe that the level of poverty was not the main factor leading to their selection as rotating members but, instead, they might enjoy low levels of poverty today due to an increase of funding when rotating onto the council in the past. Indeed, U.S. foreign policy in Latin America during the Cold War was largely supported by 'a modest military aid program' to fight communism in the region (Hilton, 1981). Moreover, Brazil collaborated intimately with the United States during World War I and II and this 'justified and guaranteed, in the view of Brazilian policy makers, a postwar intensification of American aid' (Hilton, 1981).[21]

The second part of the exclusion restriction assumption (the absence of a correlation between the instrument and the error term), cannot, in general be tested (Angrist and Pischke, 2008) but can be argued by ruling out any effect caused by the omitted variables. This is tricky since estimations may exclude potential relevant determinants of poverty – in which case

tionship. Please refer to figures A.3 and A.4 in the Appendix.

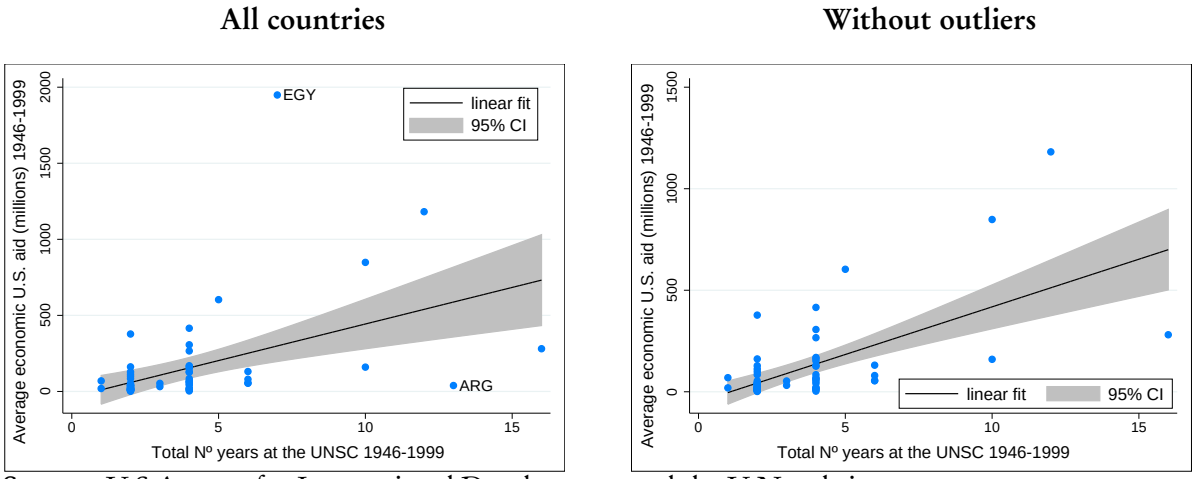
[21]Since the relationship between poverty levels and years on the council (reduced-form relationship) might be led by these three countries, I check for the robustness of results when controlling for Brazil and Colombia (I already control for Argentina as an outlier in the aid-poverty relationship (justification for this is found later in this section). I find that baseline results are indeed robust. I do not present them here, but they can be provided upon request.

the information would be kept in the residual term – and, if they are potentially related to the instrument, the condition would be violated. As unobserved time-invariant characteristics that could be related to the instrument, one can point out those specific to the region where the country is located. For instance, following previous arguments, Latin America was a specific region of influence for Washington during the Cold War period and, as such, countries like Colombia, Brazil and Argentina may have had a higher probability of being elected than countries in Eastern Europe that were already under the influence of the Soviet Union. Empirically, it is possible to control for these unobservable characteristics by including regional dummy variables (cf. results section) and thus avoid a potential correlation between the error term and the instrument.

Another potential determinant of poverty that might be related to the instrument is whether the country is endowed with natural resources. Indeed, the large literature on the political economy of the resource curse provides evidence of a negative relationship between natural resource endowment, economic growth and poverty (see, for instance, Sachs and Warner (1995); Sala-i-Martin and Subramanian (2008). Moreover, resource endowment could be a strategic factor influencing votes in the UNSC. If not measured, the instrument might invalidate the exclusion restriction statement. I therefore control for this issue in the robustness checks section. Finally, poverty as a multidimensional phenomenon might be affected by unemployment, health status, educational level, and housing conditions, for instance. However, including these variables in the equation may introduce another problem of reverse causality since most of them are measured in the MPI. Further, the instrument is less likely to be related to these factors.

Moving forward, the other main assumption in the instrumental variable method is a strong correlation between the instrument and the endogenous variable of interest. Figure 5, plots the relationship between the total number of years a country has spent on the UNSC and the average amount of economic aid received from the U.S., between the years 1946 and 1999. There seems to exist a large correlation between the two variables (0.46). However, two outliers are noticed, Egypt and Argentina, which have respectively received exceptionally high and relatively low amounts of aid in relation to their number of years on the council. When controlling for these outliers, the correlation between the two variables increases to 0.61. The relevance of the instrument in this sense can be empirically tested in the first stage of the regression (cf. results section). The theoretical argument that assumes a close relationship between both variables is, again, supported by evidence from previous studies, such as Alesina and Dollar (2000) and Meernik et al. (1998). Whereas the former underlines

**Figure 5: Total number of years at the UNSC and average U.S. economic aid received**




**Source:** U.S Agency for International Development and the U.N website
**Note:** country abbreviations are for Argentina (ARG) and Egypt (EGY).

that a colonial past, voting patterns in the United Nations and political alliances could be major determinants of foreign aid, the latter highlights that there was indeed a shift in the intentions of U.S. foreign aid from strategic and diplomatic needs to development promotion after the Cold War (cf. literature review section).

# 5 Empirical Strategy and Main Results

## 5.1 Empirical strategy

For country $i$, I estimate using Two-Stage Least-Squares (2SLS) and by Ordinary Least Squares (OLS), a cross-sectional linear model as follows:

$$y_i = \gamma_r + \alpha_1 AID_i + x_i'\zeta + \varepsilon_i, \tag{1}$$

where $y_i$ is the average value of poverty for country i=1, …, 64 between 2000 and 2014. $AID_i$ is the average U.S economic aid received by the country between 1946 and 1999. The coefficient $\alpha_1$ measures the association between U.S. aid and poverty – on average – which is the parameter of interest throughout the paper. I include dummy variables at the regional level, measured by the coefficient $\gamma_r$, accounting for the specific and unobserved characteristics of each region. $x_i'\zeta$ is the vector of covariates. And $\varepsilon_i$ is the error term assumed of mean 0 and variance $\sigma_\varepsilon^2$, clustered at the country level. $AID_i$ is treated as endogenous and

**Table 2: Main results of the OLS estimation**

**(a) Income Poverty $1.90/day**

| | (1) Gap | (2) H | (3) Gap | (4) H | (5) Gap | (6) H |
|---|---|---|---|---|---|---|
| AID | -0.013** | -0.022* | -0.030** | -0.078*** | -0.043* | -0.025 |
| | (0.005) | (0.013) | (0.012) | (0.026) | (0.012) | (0.024) |
| Observations | 58 | 58 | 58 | 58 | 58 | 58 |
| Covariates | NO | NO | YES | YES | YES | YES |
| Outliers | NO | NO | YES | YES | YES | YES |
| Regional dummies | NO | NO | NO | NO | YES | YES |

**(b) Income Poverty $3.10/day**

| | (7) Gap | (8) H | (9) Gap | (10) H | (11) Gap | (12) H |
|---|---|---|---|---|---|---|
| AID | -0.014 | -0.008 | -0.052*** | -0.088*** | -0.026 | -0.040 |
| | (0.009) | (0.017) | (0.017) | (0.028) | (0.016) | (0.026) |
| Observations | 58 | 58 | 58 | 58 | 58 | 58 |
| Covariates | NO | NO | YES | YES | YES | YES |
| Regional dummies | NO | NO | NO | NO | YES | YES |

**(c) Multidimensional Poverty**

| | (13) MPI | (14) H | (15) MPI | (16) H | (17) MPI | (18) H |
|---|---|---|---|---|---|---|
| AID | -0.0.10** | -0.016* | -0.059*** | -0.100*** | -0.018** | -0.034** |
| | (0.005) | (0.008) | (0.016) | (0.027) | (0.007) | (0.014) |
| Observations | 64 | 64 | 64 | 64 | 64 | 64 |
| Covariates | NO | NO | YES | YES | YES | YES |
| Regional dummies | NO | NO | NO | NO | YES | YES |

**Notes:** Robust standard errors clustered at country level in parentheses. Covariates include per capita GDP growth, population density, trade (% GDP), per capita GDP and polity 2. Outliers for income poverty regressions are India and Pakistan (India and Pakistan are the outliers in the income poverty-AID relationship (cf. figures A.1 and A.2 in the Appendix). Outliers for multidimensional poverty regressions are India, Pakistan and Egypt. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3). Regional dummies for income poverty regressions are Latin America, Europe and Asia (Africa is the reference dummy. There is no income poverty information for the Middle East economies considered in the study). Regional dummies for multidimensional poverty regressions are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

modelled as follows:

$$AID_i = \gamma_r + \delta\, UNSC_i + x_i'\zeta + \nu_i, \tag{2}$$

where $UNSC_i$ is the total number of years a country has spent on the UNSC between 1946 and 1999. The coefficient $\delta$ measures the average effect of an additional year on the UNSC on the average amount of aid received by the country. $x_i'\zeta$ is the vector of covariates. And $\nu_i$ is the error term assumed of mean 0 and variance $\sigma_\nu^2$.

## 5.2 Main results

Table 2 shows empirical results from OLS estimations of equation (1). Columns 1 to 12 present OLS regressions of income poverty – as measured by the poverty gap and the headcount ratio for $1.90/day and $3.10/day – for U.S. aid. Columns 13 to 18 show results from multidimensional poverty regressions – as measured by the MPI and the headcount ratio.

The two first columns of each measure report simple correlations, the third and fourth show results when adding controls for outliers and covariates and the last two report results when adding controls for specific regional characteristics. Comparing simple correlations for both income and multidimensional poverty measures, one observes that an increase in U.S. aid seems to be significantly related to a reduction in multidimensional poverty and severe income poverty (columns 1 to 2 and 13 to 14, respectively). This is true when introducing the set of covariates and outliers (columns 3 to 4 and 15 to 16, respectively). Columns 9 and 10 for the poverty gap and the headcount ratio at $3.10/day also report a significant relationship between aid and income poverty when accounting for outliers and covariates. However, when unobservable characteristics at the regional level are taken into account, the relationship seems to remain more significant when poverty is measured from a multidimensional rather than an income perspective. Indeed, when comparing results from columns 5 to 6, 11 to 12 and 17 to 18, aid is – on average – more significantly related to a decrease in the MPI and the multidimensional headcount ratio (columns 17 and 18) than to a decrease in income poverty, where only a negative relationship for the severe income poverty gap, significant at the 10% confidence level, is observed.

In order to control for potential reverse causality and endogeneity issues between poverty variables and aid, I run 2SLS regressions of equation (1). Results are presented in table 3 below. As previously stated, I use the total number of years a country has spent on the UNSC as an instrument for U.S. aid. Columns 1, 3, 5, 7, 9 and 11 show first-stage results. The UNSC coefficient is positive and statistically significant at the 1% confidence level in all of the specifications, suggesting that rotation onto the council is related to a higher amount of aid received by a country on average. The relevance of the instrument is tested in the first-stage regression. As a rule of thumb, Stock et al. (2002) and Angrist and Pischke (2008) suggest that the F-statistic of a joint test determining whether the excluded instrument is significantly different from zero should be bigger than 10 in the case of a single endogenous regressor. In the case of a single instrument and a single endogenous regressor, this implies that the t-value for the instrument should be bigger than 3.2 or the corresponding p-value below 0.002. Results in table 3 (t-test in brackets and F-test in the last row) show that these

requirements are indeed satisfied for both multidimensional poverty and income poverty.

Comparing OLS results in columns 5 and 11 of table 2 with 2SLS results in columns 4 and 8 of table 3, it is observed that $\alpha_1$ is no longer significant for the income poverty gap at \$1.90/day when accounting for potential endogeneity of the aid variable and the remaining coefficients do not differ in size across estimation methods. Nonetheless, the 2SLS estimated coefficient of the multidimensional poverty regression (column 12) is larger and more significant than the OLS regression (column 17).

First-stage results in column 11 of table 3 suggest that one additional year on the UNSC during 1946 to 1999 is related to a higher amount of economic aid received from the United States – almost US\$21 million, on average, among the 64 countries. In turn, U.S. aid seems to be associated with an MPI that is 0.08 percentage points lower but does not seem to be significantly related to a lower income poverty gap or a lower headcount ratio – at either \$1.90/day or \$3.10/day.[22] Because of potential reverse causality and endogeneity issues between poverty and aid, 2SLS results are preferred to OLS. I therefore proceed with 2SLS estimations in the remainder of the article.

Table 4 reports detailed 2SLS estimation results from equation (1) on the MPI. I go step by step, adding control variables and showing in each column first-stage statistics. In the last two rows of the table, one can observe that the F-test of excluded instruments and the t-test of the UNSC coefficient are larger than 10 and 3.2 in almost all the specifications. This already informs that the instrument passes the required statistical test for the validity of its correlation with the aid variable. Moreover, the coefficient of interest from equation (1), $\alpha_1$, remains highly significant and negative in all columns, independent of the additional control variable and the specific regional characteristics, suggesting a close average relationship between a higher amount of aid received by the country over the period from 1946 to 1999 and a lower MPI between 2000 and 2014. Columns 11 and 12 from table 3 and columns 7 and 8 from table 4 are the same and report baseline results from regressions on multidimensional poverty.

As previously noted, an additional year on the UNSC during 1946 to 1999 seems to be related to a US\$21 million increase – on average – in the amount of aid received from the United States among the 64 countries of the study. At the same time, an additional US\$1 million

[22]Results are robust when controlling for Brazil and Colombia as potential leaders of the UNSC-poverty relationship. I do this in order to check that the exclusion restriction assumption holds (i.e., that the only relationship that exists between the instrument and the outcome is through the first-stage channel [UNSC-aid relationship]) (cf. the instrument section). Results can be provided upon request.

**Table 3: Main results of 2SLS estimation**

**(a) Income Poverty Gap $1.90/day**

| | (1) AID 1st stage | (2) IP 2nd stage | (3) AID 1st stage | (4) IP 2nd stage |
|---|---|---|---|---|
| UNSC | 19.098*** | | 18.507*** | |
| | (3.686) | | (3.028) | |
| | [5.18] | | [6.11] | |
| AID | | -0.046** | | -0.023 |
| | | (0.023) | | (0.020) |
| Observations | 58 | 58 | 58 | 58 |
| Regional dummies | NO | NO | YES | YES |
| F-test | 26.84 | – | 37.34 | – |

**(b) Income Poverty Gap $3.10/day**

| | (5) AID 1st stage | (6) IP 2nd stage | (7) AID 1st stage | (8) IP 2nd stage |
|---|---|---|---|---|
| UNSC | 19.098*** | | 18.507*** | |
| | (3.686) | | (3.028) | |
| | [5.18] | | [6.11] | |
| AID | | -0.080** | | -0.038 |
| | | (0.036) | | (0.030) |
| Observations | 58 | 58 | 58 | 58 |
| Regional dummies | NO | NO | YES | YES |
| F-test | 26.84 | – | 37.34 | – |

**(c) Multidimensional Poverty Index**

| | (9) AID 1st stage | (10) MPI 2nd stage | (11) AID 1st stage | (12) MPI 2nd stage |
|---|---|---|---|---|
| UNSC | 20.981*** | | 20.314*** | |
| | (4.293) | | (3.543) | |
| | [4.89] | | [5.73] | |
| AID | | -0.128*** | | -0.083*** |
| | | (0.036) | | (0.032) |
| Observations | 64 | 64 | 64 | 64 |
| Regional dummies | NO | NO | YES | YES |
| F-test | 23.88 | – | 32.88 | – |

**Notes:** Robust standard errors clustered at country level in parentheses. T-values in brackets. Covariates and outliers are included in all the regressions. F-test is the first-stage test of excluded instruments. Covariates and outliers are included in all the regressions. Covariates include per capita GDP growth, population density, trade (% GDP), per capita GDP and polity 2. Outliers for income poverty regressions are India, Pakistan and Argentina. India and Pakistan are the outliers in the income poverty-AID relationship (cf. figure A.1 and A.2 in the Appendix); Argentina is the outlier in the UNSC-AID relationship (cf. figure 5). Outliers for multidimensional poverty regressions are India, Pakistan, Egypt and Argentina (India, Pakistan and Egypt are the outliers in the income poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies for income poverty regressions are Latin America, Europe and Asia (Africa is the reference dummy. There is no income poverty information for the Middle East economies considered in the study). Regional dummies for multidimensional poverty regressions are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

**Table 4: Step-by-step 2SLS estimation for MPI**

| | (1) 2nd stage | (2) 2nd stage | (3) 2nd stage | (4) 2nd stage | (5) 2nd stage | (6) 2nd stage | Baseline results (7) 2nd stage |
|---|---|---|---|---|---|---|---|
| AID | -0.126*** | -0.113*** | -0.100*** | -0.186*** | -0.146*** | -0.128*** | -0.083*** |
| | (0.037) | (0.035) | (0.034) | (0.055) | (0.048) | (0.036) | (0.032) |
| Polity 2 | | -1.194*** | -1.218*** | -0.694 | -0.082 | -0.386 | -0.003 |
| | | (0.443) | (0.398) | (0.660) | (0.619) | (0.568) | (0.301) |
| Growth | | | -1.940 | -1.935* | -1.013 | -1.310 | -0.799 |
| | | | (1.192) | (1.105) | (1.157) | (1.150) | (1.181) |
| Trade | | | | -0.387*** | -0.264*** | -0.235*** | -0.199*** |
| | | | | (0.139) | (0.089) | (0.076) | (0.057) |
| Pc GDP | | | | | -0.003*** | -0.003*** | -0.002** |
| | | | | | (0.001) | (0.001) | (0.001) |
| Population | | | | | | 0.027 | 0.018 |
| | | | | | | (0.019) | (0.015) |
| Observations | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| Regional dummies | NO | NO | NO | NO | NO | NO | YES |
| MPI mean | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 |
| AID mean | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 |
| F-test | 18.91 | 17.59 | 16.78 | 8.84 | 11.96 | 23.88 | 32.88 |
| T-test | 4.35 | 4.19 | 4.10 | 2.97 | 3.46 | 4.89 | 5.73 |

**Notes:** Robust standard errors clustered at country level in parentheses. Growth stands for per capita GDP growth, trade is as % of GDP and population stands for population density. Outliers are included in all regressions. F-test is the first-stage test of excluded instruments and T-test is from the UNSC variable. Outliers are India, Pakistan, Egypt and Argentina. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

(2014 US$) per year – US$53 million from 1946 to 1999 – is associated with a 0.08 percentage points lower MPI – on average. Since the average amount of aid received over the period was US$143.7 million (cf. table 4 and 1), it is possible to say that a country received roughly 14.6% more aid from the U.S. on average during the period 1946–1999 when rotating at least one additional year onto the council.[23] The elasticity of poverty to aid can be obtained as follows:

$$\eta^{P}_{AID} = \alpha_1 \frac{\overline{AID}}{\overline{P}}, \tag{3}$$

where $\eta^{P}_{AID}$ is the elasticity of poverty – as measured by the different specifications – to aid; $\alpha_1$ is the estimated coefficient of the aid variable; $\overline{AID}$ is the average amount of aid received from the U.S. among the sample of 64 countries between the period 1946–1999; and $\overline{P}$ is the average poverty value among the sample of 64 countries between 2000 and 2014. Considering the average amount of aid and the average value of MPI (cf. table 4 and 1), the elasticity of MPI to U.S. aid is 0.61, meaning that a 1% increase in the average amount of aid received from the U.S. over the period 1946–1999 is associated – on average – with a 0.61% reduction in the MPI. This suggests that poverty reduction does not move strictly in tandem with aid but only to a lesser extent.

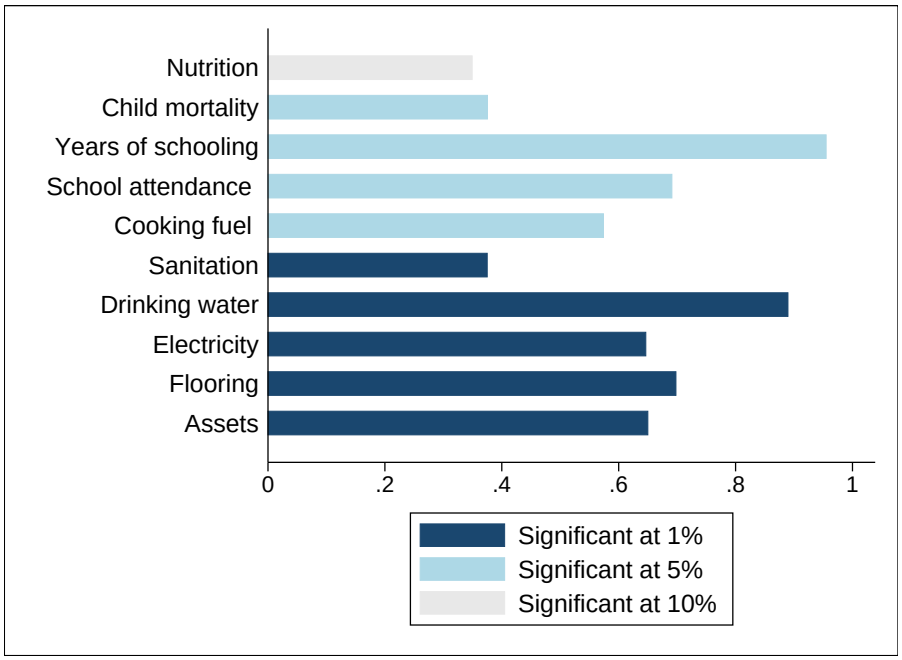
I am then interested in analysing the decomposed relationship between U.S. aid and each indicator considered in the MPI. For this purpose, I run previous regressions of equation (1), but I replace the global poverty measures by each indicator (years of schooling, nutrition, drinking water, etc.) as dependent variables. Results from 2SLS estimations are reported in table 5 and figure 6 represents the size of the elasticity of each indicator to aid, calculated following equation (3).

It is observed that aid is significantly related to all the indicators included in the MPI. The largest elasticity relates to the dimension on education, where a 1% increase in average aid received is associated with a 0.95% and 0.69% reduction in the percentage of multidimensionally poor people deprived in years of schooling and school attendance, respectively.

The second largest elasticity concerns the dimension of living standards, which ranges from the highest on drinking water (0.89) to the lowest on sanitation (0.38). On average among the sample, a 1% increase in the average amount of aid received from the U.S. over the period 1946–1999 is associated with a reduction of 0.64%, 0.36% and 0.82% in the percentage

[23] The relationship in percentages is calculated by dividing the estimated coefficient by the mean of the outcome variable.

**Figure 6: Size of MPI elasticities to aid: decomposition by indicator**




**Note:** Author's calculations.

**Table 5: Main results for MPI indicators (2SLS estimation)**

| | Education | | Health | | | Living Standard | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Schooling | (2) Attendance | (3) Mortality | (4) Nutrition | (5) Electricity | (6) Water | (7) Sanitation | (8) Flooring | (9) Fuel | (10) Assets |
| AID | -0.103** | -0.088** | -0.052** | -0.035* | -0.130*** | -0.077*** | -0.117*** | -0.119*** | -0.137** | -0.090*** |
| | (0.043) | (0.042) | (0.026) | (0.019) | (0.050) | (0.027) | (0.04) | (0.044) | (0.058) | (0.034) |
| Observations | 64 | 58 | 61 | 60 | 63 | 64 | 64 | 63 | 62 | 64 |
| Outcome mean | 15.5 | 18.3 | 19.9 | 14.4 | 28.9 | 29.5 | 18.9 | 24.5 | 34.3 | 19.9 |
| AID mean | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 |
| F-test | 32.88 | 25.80 | 34.86 | 26.30 | 34.25 | 32.88 | 32.88 | 33.36 | 43.74 | 32.88 |
| T-test | 5.73 | 5.08 | 5.90 | 5.13 | 5.85 | 5.73 | 5.73 | 5.78 | 6.61 | 5.73 |

**Notes:** Robust standard errors clustered at country level in parentheses. Covariates and outliers are included in all the regressions. F-test is the first-stage test of excluded instruments and T-test is from the UNSC variable. Covariates, regional dummies and outliers are included in all the regressions. Covariates include per capita GDP growth, population density, trade (% GDP), per capita GDP and polity 2. Outliers are India, Pakistan, Egypt and Argentina. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

of multidimensionally poor people deprived in living standards, health and education, on average, respectively.

# 6 Robustness Checks

In order to confirm or disprove the stability of the coefficients observed so far, I challenge the estimations results using three robustness checks. The first considers alternative measures of institutional quality; the second one includes the share of U.S. aid received – as a percentage of total aid received – and government consumption as additional controls in a 2SLS estimation of equation (1); and the third one controls for resource endowment of the country during the period 1960 and 1999.

## 6.1 Alternative proxies of institutional quality

Previous studies on aid have used different measures of institutional quality. For instance, Kuziemko and Werker (2006) and Kosack (2003) use the measure of Polity 2, which has the advantage of being available since 1946. Alternative measures such as political rights and civil liberties from the Freedom in the World survey (Puddington and Roylance, 2016) have been used by Galiani et al. (2017), Lensink and White (2001) and Alesina and Dollar (2000). And the measure of ethnic fractionalization appears in studies such as Dalgaard et al. (2004), Hansen and Tarp (2001) and Burnside and Dollar (2000). Apart from ethnic fractionalization, Alesina et al. (2003) have created measures of language and religious fractionalization. Correlations between these three variables range from 0.3 to 0.6.[24] I have decided to consider all three in this section in order to control for the potential role played by existing population divisions.

I proceed by replacing the polity 2 variable with alternative measures of institutional quality in the 2SLS estimations of equation (1). Table 6 reports baseline results for MPI in column 1 and robustness in columns 2 to 6. The coefficient of aid is statistically significant and remains quite stable in all the specifications, although significance is reduced in the last three columns. This suggest that aid is significantly associated with a decrease in the MPI on average, independently of the level of democracy (polity 2), the level of freedom in the country (political Rights and civil liberties) and the type of fractionalization (ethnic, language and re-

[24] Detailed correlations for these alternative measures of institutional quality can be provided upon request.

ligious) characterising the population.[25] Moreover, the first-stage results reported in the last two rows of table 6 show that the instrument still passes the relevant statistical tests (F-test of excluded instruments and t-test of UNSC).

**Table 6: Robustness checks: alternative measures of institutional quality**

| | Baseline results | Robustness of baseline results | | | | |
|---|---|---|---|---|---|---|
| | (1) MPI | (2) MPI | (3) MPI | (4) MPI | (5) MPI | (6) MPI |
| AID | -0.083*** | -0.083*** | -0.083*** | -0.086** | -0.077** | -0.082** |
| | (0.032) | (0.032) | (0.032) | (0.034) | (0.031) | (0.033) |
| Polity 2 | -0.003 | | | | | |
| | (0.301) | | | | | |
| Political Rights | | 0.483 | | | | |
| | | (1.270) | | | | |
| Civil Liberties | | | 0.313 | | | |
| | | | (1.554) | | | |
| Ethnic | | | | 11.308 | | |
| | | | | (7.934) | | |
| Religious | | | | | -6.951 | |
| | | | | | (7.286) | |
| Language | | | | | | 6.077 |
| | | | | | | (6.198) |
| Observations | 64 | 64 | 64 | 63 | 64 | 63 |
| F-test | 32.88 | 33.32 | 34.62 | 43.94 | 35.16 | 34.77 |
| T-test | 5.73 | 5.77 | 5.88 | 6.63 | 5.93 | 5.90 |

**Notes:** Robust standard errors clustered at country level in parentheses. Coefficients are estimated by 2SLS. Ethnic, religious and language stand for the 3 different types of fractionalisations. F-test is the first-stage test of excluded instruments and T-test is from the UNSC variable. Covariates and outliers are included in all the regressions. Covariates include per capita GDP growth, population density, trade (% GDP) and per capita GDP. Outliers are India, Pakistan, Egypt and Argentina. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies are included in all the regressions and include Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

## 6.2 Additional controls

Two potential additional determinants of poverty that might be correlated with selection onto the UNSC are the amount of aid received by other donors and government expenditure. Indeed, one may think that an increase in funds received from the U.S. due to rotation onto the council can influence the amount received from other donors. I control for this

[25]Results are also robust when regressing the 10 indicators considered in the MPI and the income poverty measures on alternative proxies of institutional quality. They can be provided upon request.

**Table 7: Robustness checks: additional controls (share US aid & government consumption)**

| | IP Gap $1.90/day | | | IP Gap $3.10/day | | | MPI | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) IP | (2) IP | (3) IP | (4) IP | (5) IP | (6) IP | (7) MPI | (8) MPI | (9) MPI |
| AID | -0.015 | -0.011 | 0.008 | -0.025 | -0.020 | 0.009 | -0.070** | -0.071** | -0.055* |
| | (0.022) | (0.019) | (0.020) | (0.032) | (0.028) | (0.028) | (0.033) | (0.031) | (0.032) |
| Gov. Cons. | -0.852*** | | -1.155*** | -1.219*** | | -1.665*** | -0.800** | | -0.857* |
| | (0.247) | | (0.313) | (0.296) | | (0.386) | (0.397) | | (0.498) |
| Share US aid | | -0.085 | -0.204** | | -0.134 | -0.313*** | | 0.006 | -0.070 |
| | | (0.109) | (0.086) | | (0.159) | (0.117) | | (0.126) | (0.114) |
| Observations | 57 | 54 | 53 | 57 | 54 | 53 | 63 | 60 | 59 |
| F-test | 31.72 | 32.98 | 29.61 | 31.72 | 32.98 | 29.61 | 29.48 | 34.08 | 32.59 |
| T-test | 5.63 | 5.74 | 5.44 | 5.63 | 5.74 | 5.44 | 5.43 | 5.84 | 5.71 |

**Notes:** Robust standard errors clustered at country level in parentheses. Coefficients are estimated by 2SLS. IP stands for income poverty. F-test is the first-stage test of excluded instruments and T-test is from the UNSC variable. Gov. Cons. stands for government consumption (as % GDP) and the share of US aid is as % of the total aid received. Covariates, outliers and regional dummies are included in all the regressions. Covariates include per capita GDP growth, population density, trade (% GDP), per capita GDP and polity 2. Outliers for income poverty regressions are India, Pakistan and Argentina. India and Pakistan are the outliers in the income poverty-AID relationship (cf. figure A.1 and A.2 in the Appendix); Argentina is the outlier in the UNSC-AID relationship (cf. figure 5). Outliers for multidimensional poverty regressions are India, Pakistan, Egypt and Argentina. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies for income poverty regressions are Latin America, Europe and Asia (Africa is the reference dummy. There is no income poverty information for the Middle East economies considered in the study). Regional dummies for multidimensional poverty regressions are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

by introducing in equation (1) the ratio of U.S. economic aid over the total (gross loans and grants) received from DAC donors, averaged over the period 1960–1999.

Concerning the second one, previous studies such as Celasun and Walliser (2008), Hudson (2015) and Bulíř and Hamann (2003, 2008) have pointed out that volatility of aid and government expenditure go hand in hand, growing with the degree of aid dependency. Authors have found that shortfalls in aid are most frequently followed by reductions in government spending and that the most volatile sectors are those linked to government, industry and program assistance (Hudson, 2015). Moreover, Celasun and Walliser (2008) found that when aid disbursements are at least 1% higher than what was expected for budget aid (relative to GDP), government consumption is significantly boosted, whereas aid shortfalls lead to cuts in investment spending. To control for these potential effects, I also introduce in equation (1) the average of government consumption (as % GDP) over the period 1960–1999. I then proceed to estimate equation (1) for the income poverty gap at $1.90/day and $3.10/day as well as for the MPI, replicating baseline estimations from table 3 (columns 3–4, 7–8 and 11–12) but with additional controls. Results are reported in table 7.

Three things are worth noting. First, columns 1 to 6 confirm that the relationship between U.S. aid and income poverty remains close to zero and non-significant, independent of additional controls. Second, independent of additional controls, higher aid is associated with

a lower MPI – although when simultaneously adding both variables the size and the significance of $\alpha_1$ are lower. And third, that government consumption seems to be significantly associated with a decrease in both the income gap and in the MPI, whereas the ratio of U.S. aid received over the total amount is related to the former.[26]

## 6.3 Natural resource endowment

The last robustness check that is carried out in order to confirm or disprove the stability of the coefficients observed so far is a control on the endowment of natural resources by a country during the period 1970–1999. I do this to control for potential factors that may be correlated simultaneously with the instrument and the outcome in order to ensure the validity of the exclusion restriction. As noted in the instrument section, countries endowed with natural resources tend to have lower levels of development and they can also be subject to international strategic interests, influencing votes in the UNSC.

To control for this, I include in equation (1) a dummy variable equal to one if the country's average total natural resource rents to GDP (in %) over the period 1970–1999 is higher than 10%, and zero otherwise (Collier, 2008).[27] Natural resource rents correspond to the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Following Collier (2008), I have used these rents instead of resource exports because primary commodity exports do not take into account the cost of production of natural resources, which are much lower, for instance, in oil than in coffee production. They are a 'poor guide to how valuable the resources really are'.[28] I thus classify 18 countries as resource-rich – 13 from Africa, 1 from Asia, 2 from Latin America and 2 from the Middle East. Then, I run 2SLS estimations of equation (1) for income poverty as measured by the \$1.90/day and \$3.10/day gap, for the MPI and the 10 indicators considered in the index. Table 8 reports results.

Two conceptual observations can be highlighted. The first is that resource-rich countries seem to present higher significant levels of both income and multidimensional poverty. One can observe that the coefficient of the dummy variable is large and statistically significant in

[26] Results are robust when replicating regressions on the 10 indicators considered in the MPI (except for deprivations in solid fuel and nutrition). They can be provided upon request.
[27] I have also considered a threshold of average natural resource rents equal to or higher than 20% of GDP and also the average amount of resource rents (as % of GDP) over the period 1970–1999. Results remain robust in all specifications. They can be provided upon request.
[28] '(...) \$1 million in oil exports generates a bigger surplus if it is coming from an easy-to-exploit onshore location than if it is deep offshore, and if the price per barrel is \$60 rather than \$10'. (Collier, 2008).

**Table 8: Robustness checks: endowment with natural resources**

| | Gap $1.90/day | Gap $3.10/day | Education | | | Health | | Living Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) IP | (2) IP | (3) MPI | (4) Schooling | (5) Attedance | (6) Mortality | (7) Nutrition | (8) Electricity | (9) Water | (10) Sanitation | (11) Flooring | (12) Fuel | (13) Assets |
| AID | -0.032 | -0.051 | -0.086** | -0.103** | -0.088** | –0.056** | -0.037* | -0.134** | -0.082*** | -0.121*** | -0.124*** | -0.141** | -0.094** |
| | (0.020) | (0.031) | (0.034) | (0.043) | (0.043) | (0.027) | (0.020) | (0.054) | (0.028) | (0.046) | (0.047) | (0.061) | (0.037) |
| Dummy RR | 8.524*** | 11.938*** | 5.886** | 0.958 | 2.674 | 9.257*** | 3.430* | 10.465** | 9.036*** | 7.552* | 10.500** | 7.885 | 8.970** |
| | (2.859) | (3.581) | (2.847) | (3.810 | (3.638) | (2.717) | (2.031) | (4.861) | (3.036) | (4.459) | (4.877) | (5.312) | (3.707) |
| Observations | 58 | 58 | 64 | 64 | 58 | 61 | 60 | 63 | 64 | 64 | 64 | 62 | 64 |
| Outcome mean | 10.8 | 21.3 | 19.5 | 15.5 | 18.3 | 19.9 | 14.4 | 28.9 | 29.5 | 18.9 | 24.5 | 34.3 | 19.9 |
| AID mean | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 | 143.7 |
| F-test | 33.65 | 33.65 | 34.09 | 34.09 | 29.97 | 36.08 | 28.92 | 35.39 | 34.09 | 34.09 | 34.43 | 57.08 | 34.09 |
| T-test | 5.80 | 5.80 | 5.84 | 5.84 | 5.47 | 6.01 | 5.38 | 5.95 | 5.84 | 5.84 | 5.87 | 7.56 | 5.84 |

**Notes:** Robust standard errors clustered at country level in parentheses. Coefficients are estimated by 2SLS. F-test is the first-stage test of excluded instruments and T-test is from the UNSC variable. Covariates, outliers and regional dummies are included in all the regressions. Covariates include per capita GDP growth, population density, trade (% GDP), per capita GDP and polity 2. Outliers for income poverty regressions are India, Pakistan and Argentina. India and Pakistan are the outliers in the income poverty-AID relationship (cf. figure A.1 and A.2 in the Appendix); Argentina is the outlier in the UNSC-AID relationship (cf. figure 5). Outliers for multidimensional poverty regressions are India, Pakistan, Egypt and Argentina. India, Pakistan and Egypt are the outliers in the multidimensional poverty-AID relationship (cf. figure 3); Argentina and Egypt are the outliers in the UNSC-AID relationship (cf. figure 5). Regional dummies for income poverty regressions are Latin America, Europe and Asia (Africa is the reference dummy. There is no income poverty information for the Middle East economies considered in the study). Regional dummies for multidimensional poverty regressions are Latin America, Europe, the Middle East and Asia (Africa is the reference dummy). *** p<0.01, ** p<0.05, * p<0.1.

almost all the specifications.

The second is that, even when accounting for this characteristic, baseline results remain robust. Indeed, the coefficients of aid and their (in)significance are quite stable, confirming that aid is associated with lower multidimensional poverty but not with lower income poverty.

Calculating elasticities for MPI and the indicators following equation (3), I find that a 1% increase in the average amount of aid received from the U.S. over the period 1946–1999 is associated – on average – with a 0.63% reduction in the MPI and with a 0.66%, 0.39% and 0.82% in the percentage of multidimensionally poor people deprived in living standards, health and education, on average, respectively. This is indeed pretty close to the results presented in the previous section – 0.61%, 0.64%, 0.36% and 0.82%, respectively – suggesting a robust, significant relationship between aid and multidimensional poverty alleviation.

# 7 Conclusions

In this study I have analysed the relationship between aid and poverty alleviation among 64 developing economies, accounting for reverse causality and endogeneity issues between poverty and aid by instrumenting aid with the total number of years a country has spent on the Security Council of the United Nations. Results have shown that countries received 14.6% more aid from the U.S. on average during the period 1946–1999 when rotating at least one additional year onto the council and that these flows seem to be significantly related to lower multidimensional poverty on average over the period 2000–2014. More precisely, a 1% increase in the average amount of aid received seems to be associated with a 0.61% reduction in the MPI – on average – among the sample.

Concerning results from the 10 indicators in the MPI, I find that an average increase of 1% in U.S. aid is related to lower percentages of multidimensionally poor people deprived in education, health and living standards (0.82%, 0.36% and 0.64%, respectively). However, the relationship between aid and income poverty, as measured by the gap and headcount ratio at $1.90/day and $3.10/day, does not seem to be statistically significant. All these results are robust to a wide range of specifications, including alternative measures of institutional quality, additional relevant control variables such as the share of U.S. aid over the total aid received by the country and the percentage of government consumption to GDP, and when considering whether the country is endowed with natural resources or not.

I conclude that alternative measures of poverty, such as the Multidimensional Poverty Index,

could help improve the understanding of the relationship between aid and poverty, other than through economic growth, as it has been mainly analysed in previous studies. Moreover, this might also contribute to improved targeting of aid disbursements.

Further research should focus on the impact of more precise dimensions of aid on the intended indicators over time. Enlarging the available data on poverty in order to be able to consider the temporal dimension should be a priority. Analysing the relationship between poverty and each of the different purposes of U.S. aid might also provide further insights. I finally hope that all these results might be relevant for policy making in developing countries in order to achieve the Sustainable Development Goals.

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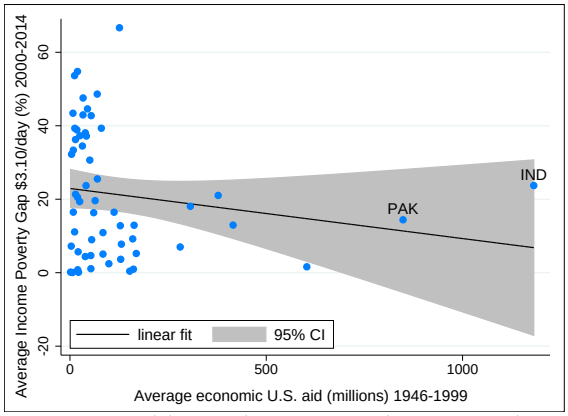
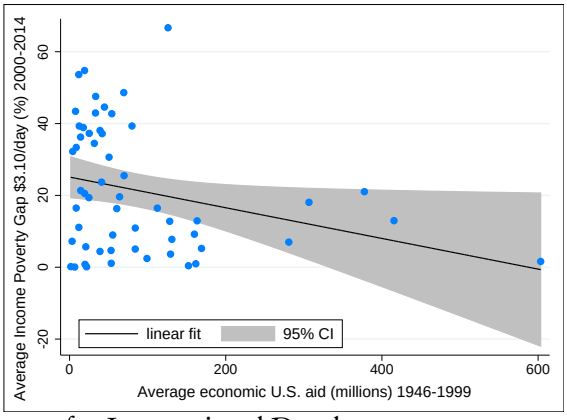
# A Figures

**Figure A.1: U.S. economic aid and income poverty gap ($PPP3.10/day)**

All countries



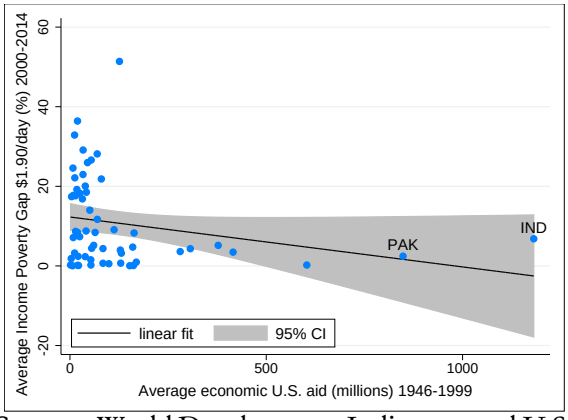

Without outliers



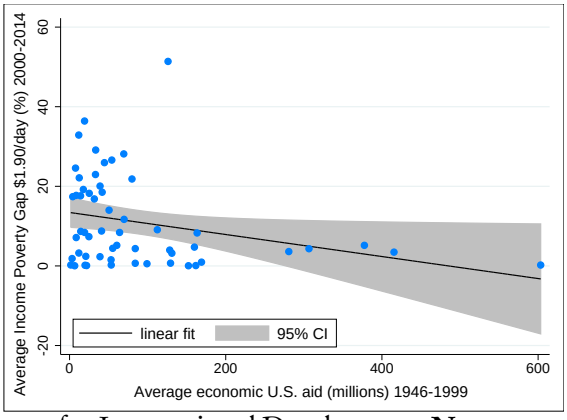

**Source:** World Development Indicators and U.S Agency for International Development
**Note:** country abbreviations are for Pakistan (PAK) and India (IND).

**Figure A.2: U.S. economic aid and income poverty gap ($PPP1.90/day)**

All countries

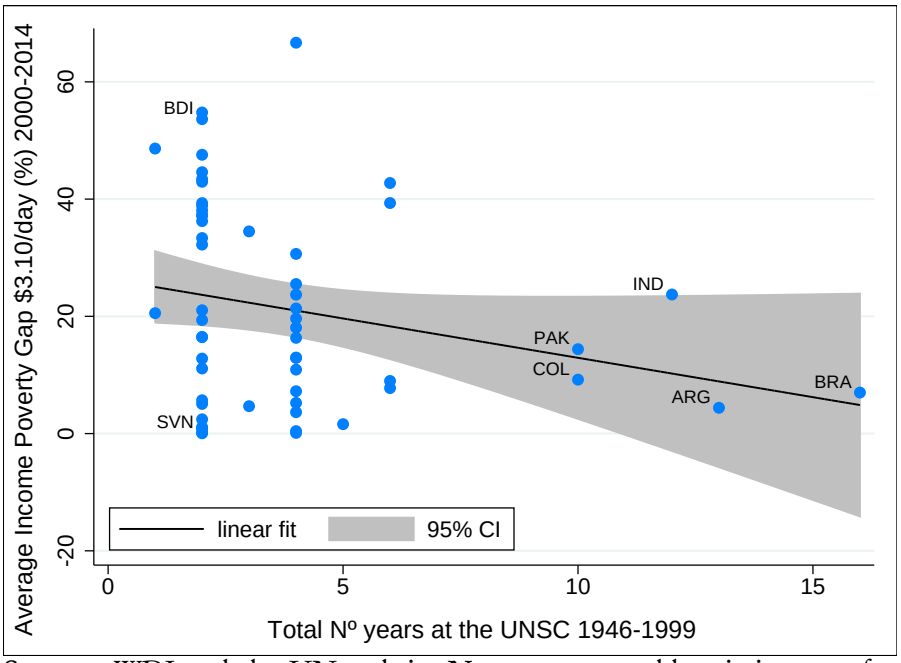



Without outliers



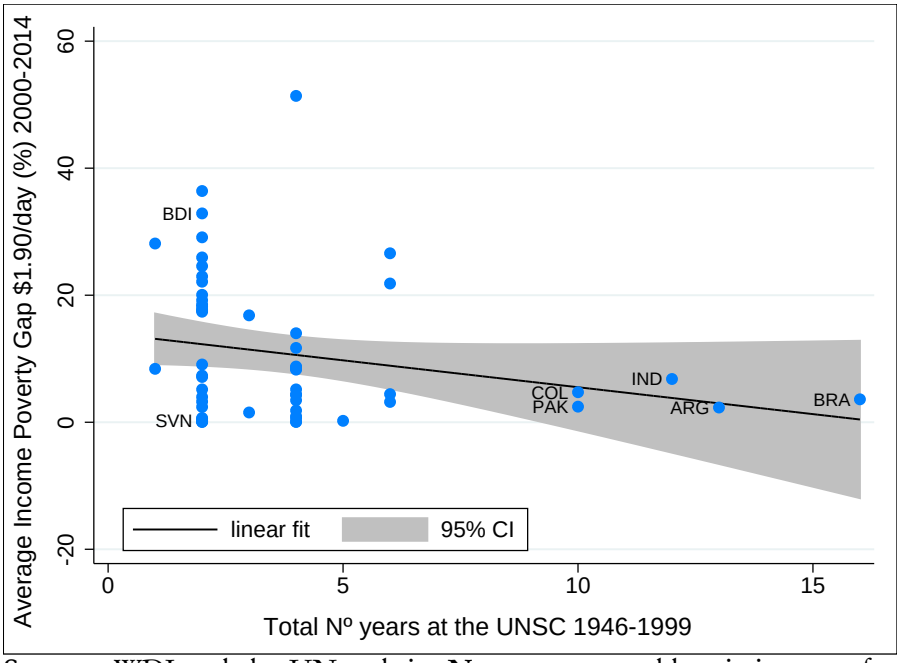

**Source:** World Development Indicators and U.S Agency for International Development **Note:** country abbreviations are for Pakistan (PAK) and India (IND).

**Figure A.3: Income poverty gap ($PPP3.10/day) and service on the UNSC**




**Source:** WDI and the UN website **Note:** country abbreviations are for Burundi (BDI), Slovenia (SVN), Pakistan (PAK), Colombia (COL), India (IND), Argentina (ARG) and Brazil (BRA).

**Figure A.4: Income poverty gap ($PPP1.90/day) and service on the UNSC**




**Source:** WDI and the UN website **Note:** country abbreviations are for Burundi (BDI), Slovenia (SVN), Pakistan (PAK), Colombia (COL), India (IND), Argentina (ARG) and Brazil (BRA).

# B Tables

**Table B.1: Dimensions, indicators, and deprivations cutoffs of the MPI**

| Dimensions of Poverty | Indicators | Deprived if: |
|---|---|---|
| HEALTH | Nutrition | Any adult under 70 years of age, or any child for whom there is nutritional information is undernourished in terms of weight-for-age |
| | Child mortality | Any child had died in the family in the 5-year period preceeding the survey |
| EDUCATION | Years of schooling | No household member aged 10 or older has completed 5 years of schooling |
| | School attendance | School-aged child is not attending school up to the age at which he/she would complete class 8 |
| LIVING STANDARDS | Cooking Fuel | The household cooks with dung, wood or charcoal |
| | Sanitation | The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households |
| | Drinking water | The household's does not have access to improved drinking water (according to MDG guidelines) or safe drinking water is at least 30-minute walk from home, roudtrip |
| | Electricity | The household has no electricity |
| | Flooring | The household has a dirt, sand dung, or 'other' (unspecified) type of floor |
| | Assets | The household does not own more than one radio, TV, telephone, bicycle, motorbike or refrigerator and does not own a car or truck |

**Source:** Alkire et al. (2016)

**Table B.2: Data description and sources**

| Variables | Description | Sources |
|---|---|---|
| MPI | Average of Multidimensional Poverty Index (%) 2000–2014 | OPHI |
| MPI H | Average of Multidimensional Poverty headcount ratio (%) 2000–2014 | OPHI |
| IP GAP $3.10/day | Average income poverty gap at $3.10 a day (2011 PPP) 2000–2014 | WDI |
| IP H $3.10/day | Average income poverty headcount ratio at $3.10 a day (2011 PPP) 2000–2014 | WDI |
| IP GAP $1.90/day | Average income poverty gap at $1.90 a day (2011 PPP) 2000–2014 | WDI |
| IP H $1.90/day | Average income poverty headcount ratio at $1.90 a day (2011 PPP) 2000–2014 | WDI |
| UNSC | Total number of years a country has spent on the Security Council of the United Nations 1946–1999 | UN website |
| AID | Average economic grants and loans from the United States 1946–1999 (in millions) | U.S. Agency for International Development |
| Growth | Annualised per capita growth rate, constant GDP (2010 US$)(%) 1960–1999 | WDI |
| Per capita GDP | Average per capita GDP, constant (2010 US$)(%) 1960–1999 | WDI |
| Trade | Average of trade (sum of exports and imports of goods and services) (% GDP) 1960–1999 | WDI |
| Polity 2 | Average of the revised combined polity score 1946–1999. The Polity score ranges from +10 (strongly democratic) to -10 (strongly autocratic) | Polity Project of the Center for Systemic Peace (Marshall et al., 2017) |
| Political Rights | Average of the Political Rights Score 1972–1999. The political rights score ranges from 1 (free) to 7 (not free) | Freedom House website |
| Civil Liberties | Average of the Civil Liberties Score 1972–1999. The civil liberties score ranges from 1 (free) to 7 (not free) | Freedom House website |
| Ethic Frac. | One year per country before 2001, country specific. The score ranges from 0 (not fractionalised) to 0.9 (highly fractionalised) | Alesina et al. (2003) |
| Language Frac. | One year per country before 2001, country specific. The score ranges from 0 (not fractionalised) to 0.9 (highly fractionalised) | Alesina et al. (2003) |
| Religious Frac. | One year per country before 2001, country specific. The score ranges from 0 (not fractionalised) to 0.9 (highly fractionalised) | Alesina et al. (2003) |
| Gov. Cons. | Average government consumption (% GDP) 1960–1999 | WDI |
| Share US aid | Average U.S. aid (as % total aid received) 1960–1999. Ratio U.S. economic aid over total ODA gross loans and grants from DAC countries | OECD and U.S. Agency for International Development |
| Population Density | Average population density 1960–1999 | WDI |
| Dummy RR | Dummy variable equal to 1 if the average total natural resources rents (% GDP) over 1970–1999 period is equal or larger than 10% | WDI |

**Table B.3: Summary statistics of the ten indicators considered in the MPI**

| Dimensions of Poverty | Indicators | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|---|
| HEALTH | Nutrition | 60 | 14.4 | 11.9 | 0 | 38.2 |
| | Child mortality | 61 | 19.9 | 16.5 | 0 | 55.9 |
| EDUCATION | Years of Schooling | 64 | 15.5 | 16.7 | 0 | 62.7 |
| | School Attendance | 58 | 18.3 | 17.1 | 0 | 63.7 |
| LIVING STANDARDS | Cooking Fuel | 62 | 34.3 | 29.7 | 0 | 90.7 |
| | Sanitation | 64 | 29.5 | 26.0 | 0 | 86.2 |
| | Drinking Water | 64 | 18.9 | 18.4 | 0 | 57.7 |
| | Electricity | 63 | 28.9 | 28.5 | 0 | 84.5 |
| | Flooring | 63 | 24.5 | 23.9 | 0 | 82.6 |
| | Assets | 64 | 19.9 | 18.8 | 0 | 67.2 |

**Table B.4: Correlation matrix for 59 observations**

| Variables | MPI | MPI H | AID | UNSC | Growth | Pc GDP | Trade | Polity 2 | Pop. dens. | AID/total |
|---|---|---|---|---|---|---|---|---|---|---|
| MPI H | 0.99 | | | | | | | | | |
| AID | -0.17 | -0.17 | | | | | | | | |
| UNSC | -0.27 | -0.27 | 0.46 | | | | | | | |
| Growth | -0.33 | -0.34 | 0.24 | 0.21 | | | | | | |
| Pc GDP | -0.54 | -0.56 | -0.14 | 0.12 | 0.23 | | | | | |
| Trade | -0.24 | -0.23 | -0.25 | -0.42 | -0.16 | 0.22 | | | | |
| Polity 2 | -0.43 | -0.44 | 0.13 | 0.17 | 0.06 | 0.44 | 0.00 | | | |
| Pop. dens. | -0.08 | -0.07 | 0.22 | -0.04 | 0.11 | 0.00 | -0.19 | 0.32 | | |
| AID/total | -0.39 | -0.41 | 0.36 | 0.15 | 0.08 | -0.00 | 0.04 | 0.32 | 0.09 | |
| Gov. Consumption | -0.18 | -0.18 | -0.10 | -0.19 | -0.23 | 0.20 | 0.67 | -0.05 | -0.26 | -0.16 |

**Table B.5: Years at the UNSC, average U.S. aid, average multidimensional and income poverty**

| Country | Code | Survey Year | MPI (%) (00-14) | Survey Year | IP GAP $3.10/day (%) (00-14) | Years UNSC (46-99) | U.S. Eco. Aid (mill.) (46-99) |
|---|---|---|---|---|---|---|---|
| **Sub-Saharan Africa** | | | | | | | |
| Benin | BEN | 2006, 2011/12 | 35.9 | 2003, 2011 | 36.2 | 2 | 14.1 |
| Burkina Faso | BFA | 2006, 2010 | 53.6 | 2003, 2009, 2014 | 37.3 | 2 | 25.2 |
| Burundi | BDI | 2005, 2010 | 49.2 | 2006 | 53.6 | 2 | 11.8 |
| Cameroon | CMR | 2004, 2011 | 26.7 | 2001, 2007, 2014 | 19.4 | 2 | 24.8 |
| Congo, Democratic Rep. | COD | 2007, 2010, 2013/14 | 39.5 | 2004, 2012 | 66.7 | 4 | 126.1 |
| Congo, Rep. | COG | 2009, 2011/12 | 19.5 | 2005, 2011 | 32.2 | 2 | 4.1 |
| Côte d'Ivoire | CIV | 2005, 2011/12 | 33.2 | 2002, 2008 | 21.4 | 4 | 14.3 |
| Djibouti | DJI | 2006 | 13.9 | 2002, 2012 2013 | 16.5 | 2 | 8.5 |
| Gabon | GAB | 2000, 2012 | 11.6 | 2005 | 7.2 | 4 | 3.3 |
| Gambia | GMB | 2005/06, 2013 | 32.3 | 2003 | 33.4 | 2 | 8.5 |
| Ghana | GHA | 2008, 2011, 2014 | 14.6 | 2005 | 19.6 | 4 | 64.1 |
| Guinea | GIN | 2005, 2012 | 48.3 | 2002, 2007, 2012 | 38.1 | 2 | 39.1 |
| Guinea-Bissau | GNB | 2006 | 46.2 | 2002, 2010 | 43.4 | 2 | 7.7 |
| Kenya | KEN | 2003, 2008/09, 2014 | 24.0 | 2005 | 25.5 | 4 | 69.8 |
| Liberia | LBR | 2007, 2013 | 43.0 | 2007 | 48.6 | 1 | 69.4 |
| Madagascar | MDG | 2004, 2008/09 | 38.5 | 2001, 2005, 2010, 2012 | 54.8 | 2 | 19.2 |
| Mali | MLI | 2006, 2012/13 | 50.8 | 2001, 2006 2009 | 37.2 | 2 | 41.8 |
| Mauritania | MRT | 2007, 2011 | 31.9 | 2000, 2004, 2008, 2014 | 11.1 | 2 | 11.9 |
| Namibia | NAM | 2006/07, 2013 | 19.0 | 2003, 2009 | 20.5 | 1 | 19.3 |
| Niger | NER | 2006, 2012 | 62.3 | 2005, 2007, 2011, 2014 | 43.0 | 2 | 33.2 |
| Nigeria | NGA | 2003, 2008, 2011, 2013 | 30.5 | 2003, 2009 | 39.3 | 6 | 79.9 |
| Rwanda | RWA | 2005, 2010 2014/15 | 34.5 | 2000, 2005, 2010, 2013 | 47.6 | 2 | 33.5 |
| Senegal | SEN | 2005, 2010/11, | 36.6 | 2001, 2005, | 30.6 | 4 | 50.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2012/13, 2014 | | 2011 | | | |
| Sierra Leone | SLE | 2005, 2008, 2010, 2013 | 44.5 | 2003, 2011 | 38.9 | 2 | 17.7 |
| Sudan | SDN | 2010 | 32.1 | 2009 | 12.8 | 2 | 128.3 |
| Tanzania | TZA | 2008 | 35.0 | 2000, 2007, 2011 | 44.6 | 2 | 44.7 |
| Togo | TGO | 2006, 2010, 2013/14 | 26.2 | 2006, 2011 | 39.3 | 2 | 12.4 |
| Uganda | UGA | 2006, 2011 | 36.7 | 2002, 2005, 2009, 2012 | 34.5 | 3 | 31.7 |
| Zambia | ZMB | 2007, 2013/14 | 30.5 | 2002, 2004, 2006, 2010 | 42.7 | 6 | 54.1 |
| Zimbabwe | ZWE | 2006, 2010/11, 2014 | 16.0 | 2011 | 16.3 | 4 | 60.5 |
| **North Africa** | | | | | | | |
| Egypt | EGY | 2008, 2014 | 1.9 | – | – | 7 | 1948.7 |
| Morocco | MAR | 2004, 2007, 2010/11 | 7.6 | 2000, 2006 | 5.2 | 4 | 169.0 |
| Tunisia | TUN | 2003, 2011/12 | 0.7 | 2000, 2005, 2010 | 3.6 | 4 | 129.3 |
| **Middle East** | | | | | | | |
| Iraq | IRQ | 2006, 2011 | 5.2 | – | – | 4 | 10.0 |
| Jordan | JOR | 2007, 2009 2012 | 0.8 | – | – | 4 | 266.3 |
| Yemen | YEM | 2006, 2013 | 25.9 | – | – | 2 | 38.9 |
| **Latin America and the Caribbean** | | | | | | | |
| Argentine | ARG | 2005 | 1.1 | 2000-2014 | 4.2 | 13 | 39.0 |
| Bolivia | BOL | 2003, 2008 | 13.2 | 2000-2002, 2004-2009 2011-2014 | 12.9 | 4 | 163.3 |
| Brazil | BRA | 2003, 2006, 2014 | 2.4 | 2001-2009, 2011-2014 | 7.0 | 16 | 280.8 |
| Colombia | COL | 2005, 2010 | 3.1 | 2000-2005, 2008-2014 | 9.2 | 10 | 159.9 |
| Ecuador | ECU | 2003, 2013/14 | 1.1 | 2000, 2003-2014 | 9.0 | 6 | 55.3 |
| Guyana | GUY | 2005, 2009 | 4.2 | – | – | 4 | 18.1 |
| Honduras | HND | 2005/06, 2011/12 | 11.6 | 2001-2014 | 16.5 | 2 | 112.4 |
| Jamaica | JAM | 2010, 2012 | 0.7 | 2002, 2004 | 2.4 | 2 | 99.2 |
| Mexico | MEX | 2006, 2012 | 1.3 | 2000, 2002, | 4.7 | 3 | 53.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 2004, 2006, 2008, 2010, 2012, 2014 | | | |
| Nicaragua | NIC | 2001, 2006/07, 2011/12 | 13.7 | 2001, 2005, 2009, 2014 | 10.9 | 4 | 84.1 |
| Paraguay | PRY | 2002/03 | 6.4 | 2001-2014 | 5.7 | 2 | 20.8 |
| Peru | PER | 2004, 2008, 2012 | 6.5 | 2000-2014 | 7.8 | 6 | 131.0 |
| Trinidad and Tobago | TTO | 2006 | 2.0 | – | – | 2 | 12.9 |
| Uruguay | URY | 2002/03 | 0.6 | 2000-2014 | 0.8 | 2 | 19.8 |
| **Eastern Europe** | | | | | | | |
| Belarus | BLR | 2005 | 0.0 | 2000-2014 | 1.1 | 2 | 53.4 |
| Czech Republic | CZE | 2002/03 | 1.0 | 2004-2012 | 0.1 | 2 | 6.6 |
| Hungary | HUN | 2003 | 1.6 | 2000-2005, 2007-2012 | 0.1 | 4 | 21.8 |
| Slovenia | SVN | 2003 | 0.0 | 2002-2012 | 0.2 | 2 | 1.6 |
| Turkey | TUR | 2003 | 2.8 | 2002-2013 | 1.6 | 5 | 603.3 |
| Ukraine | UKR | 2007, 2012 | 0.6 | 2002-2014 | 0.4 | 4 | 152.3 |
| **Asia** | | | | | | | |
| Bangladesh | BGD | 2007, 2011, 2012/13, 2014 | 22.9 | 2000, 2005, 2010 | 21.0 | 2 | 377.6 |
| India | IND | 2005/06 | 28.3 | 2004, 2009 2011 | 23.7 | 12 | 1181.4 |
| Indonesia | IDN | 2007, 2012 | 8.1 | 2000-2014 | 18.1 | 4 | 306.6 |
| Nepal | NPL | 2006, 2011, 2014 | 23.1 | 2003, 2010 | 23.7 | 4 | 41.0 |
| Pakistan | PAK | 2006/07, 2012/13 | 24.7 | 2001, 2004, 2005, 2007, 2010, 2011 2013 | 14.4 | 10 | 848.4 |
| Philippines | PHL | 2003, 2008, 2013 | 6.1 | 2000, 2003, 2006, 2009, 2012 | 13.0 | 4 | 415.5 |
| Sri Lanka | LKA | 2003 | 2.1 | 2002, 2006, 2009, 2012 | 5.1 | 2 | 84.1 |
| Thailand | THA | 2005/06 | 0.6 | 2000, 2002, 2004, 2006-2013 | 1.0 | 2 | 161.7 |