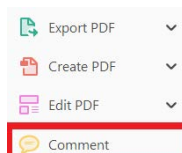


Required software to e-Annotate PDFs: **Adobe Acrobat Professional** or **Adobe Reader** (version 11 or above). (Note that this document uses screenshots from **Adobe Reader DC**.)

The latest version of Acrobat Reader can be downloaded for free at: <http://get.adobe.com/reader/>

Once you have Acrobat Reader open on your computer, click on the **Comment** tab (right-hand panel or under the Tools menu).

This will open up a ribbon panel at the top of the document. Using a tool will place a comment in the right-hand panel. The tools you will use for annotating your proof are shown below:




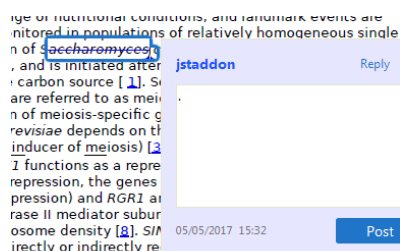
### 1. Replace (Ins) Tool – for replacing text.



Strikes a line through text and opens up a text box where replacement text can be entered.

#### How to use it:

- Highlight a word or sentence.
- Click on .
- Type the replacement text into the blue box that appears.




### 2. Strikethrough (Del) Tool – for deleting text.



Strikes a red line through text that is to be deleted.

#### How to use it:

- Highlight a word or sentence.
- Click on .
- The text will be struck out in red.

experimental data if available. For ORFs to be had to meet all of the following criteria:



1. Small size (35-250 amino acids).
2. Absence of similarity to known proteins.
3. Absence of functional data which could not be the real overlapping gene.
4. Greater than 25% overlap at the N-terminus terminus with another coding feature; over both ends; or ORF containing a tRNA.


### 3. Commenting Tool – for highlighting a section to be changed to bold or italic or for general comments.



Use these 2 tools to highlight the text where a comment is then made.

#### How to use it:

- Click on .
- Click and drag over the text you need to highlight for the comment you will add.
- Click on .
- Click close to the text you just highlighted.
- Type any instructions regarding the text to be altered into the box that appears.

informal invariance:  for  
A: Math. Gen., Vol. 12, N

lified theory for a matrix  
'ol. 8, 1984, pp. 305-323

id manuscript, 1984.

ching fractions for  $D_0 \rightarrow K+K$

relation in  $D_0$  decays' Phys




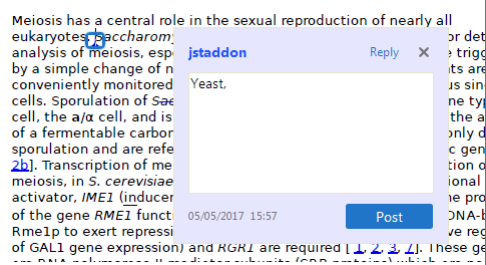
### 4. Insert Tool – for inserting missing text at specific points in the text.



Marks an insertion point in the text and opens up a text box where comments can be entered.

#### How to use it:

- Click on .
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the box that appears.




### 5. Attach File Tool – for inserting large amounts of text or replacement figures.



Inserts an icon linking to the attached file in the appropriate place in the text.

#### How to use it:

- Click on  .
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.

The attachment appears in the right-hand panel.


chondrial preparator  
ative damage injury  
the extent of membra  
malondialdehyde (TBARS) formation.  
used by high perform

### 6. Add stamp Tool – for approving a proof if no corrections are required.



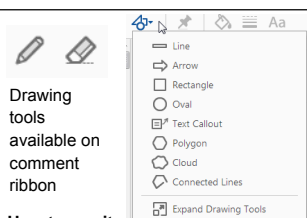
Inserts a selected stamp onto an appropriate place in the proof.

#### How to use it:

- Click on  .
- Select the stamp you want to use. (The [Approved](#) stamp is usually available directly in the menu that appears. Others are shown under *Dynamic*, *Sign Here*, *Standard Business*).
- Fill in any details and then click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

of the business cycle, starting with the  
on perfect competition, constant ret  
production. In this environment goods  
extra costs are incurred to make marks  
he total cost of production is deter  
etermined by the model. The New-Key  
otaki (1987), has introduced produc  
general equilibrium models with nomin  
and real variables. Most of this litera

**APPROVED**

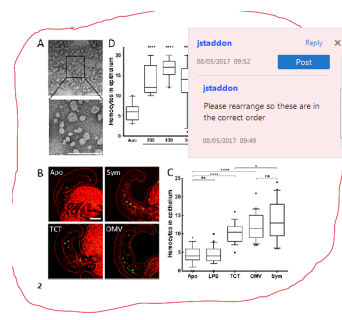


#### How to use it:

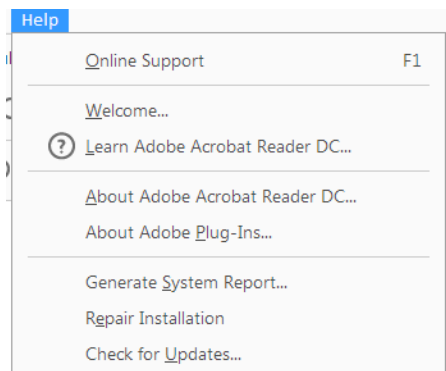
- Click on one of the shapes in the [Drawing Markups](#) section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, right-click on shape and select *Open Pop-up Note*.
- Type any text in the red box that appears.

### 7. Drawing Markups Tools – for drawing shapes, lines, and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines, and freeform annotations to be drawn on proofs and for comments to be made on these marks.



For further information on how to annotate proofs, click on the [Help](#) menu to reveal a list of further options:



# Author Query Form

WILEY

Journal: TWEC

Article: 12636

Dear Author,

During the copyediting of your manuscript the following queries arose.

Please refer to the query reference callout numbers in the page proofs and respond to each by marking the necessary comments using the PDF annotation tools.

Please remember illegible or unclear comments and corrections may delay publication.

Many thanks for your assistance.

Query reference	Query	Remarks
1	AUTHOR: Please check that authors and their affiliations are correct.	✓
2	AUTHOR: Please confirm that given names (red) and surnames/family names (green) have been identified correctly.	✓
3	AUTHOR: Please suggest whether the phrase “with these their shares” can be changed to “with their shares” in the sentence “It does so ... of global poverty” in Abstract..	✓
4	AUTHOR: Please check and confirm the edit made in the sentence “Poverty is ... poverty line”.	✓
5	AUTHOR: OECD (2017) has not been included in the Reference List, please supply full publication details.	See below
6	AUTHOR: World Bank (2017) has not been included in the Reference List, please supply full publication details.	See below
7	AUTHOR: Please check the clarity of the sentence “Verification or ... further research”.	✓
8	AUTHOR: Please check and confirm the edits made in the sentence “The biases in ... global poverty shares”. ✓	See below
9	AUTHOR: Table B4 has been changed to Figure B4. Please check.	✓
10	AUTHOR: The phrase “that which the design” has been changed to “that the design” in the sentence “This is ... to provide”. Kindly check and approve.	✓

OECD (2017), Internatioanl Development Statistics On-line Database, Paris: OECD

World Bank (2017), World Development Indicators 2017, Washington DC: World Bank

11	AUTHOR: Please suggest whether the term “Viet Nam” could be changed as “Vietnam” throughout the article.	✓
12	AUTHOR: Table B3 has been changed to Figure B3. Please check.	✓

Please also add the following acknowledgement to the paper:

An earlier version of the paper was presented at the Festschrift Conference in Honour of Professor Chris Milner, held at the University of Nottingham in June 2017. The authors are grateful for comments from the conference participants, those from Vaalmikki Arjoon and Adrian Wood in particular. The usual disclaimer applies. Financial support from the Australian Research Council (Grant DP120101781) is also acknowledged.

# Fairness in the international allocation of development aid

Mark McGillivray<sup>1</sup> | Matthew Clarke<sup>2</sup>

<sup>1</sup>Alfred Deakin Institute, Deakin University, Geelong, Vic., Australia

<sup>2</sup>School of Humanities and Social Sciences, Deakin University, Burwood, Vic., Australia

## 1 | INTRODUCTION

Donor country governments to seek to justify the not insubstantial amounts of tax payer money allocated to foreign development aid by reference to poverty levels in developing countries. Aid is justified as a response to poverty levels and their attempts to sustainably reduce poverty. Such a response is generally supported by tax payers within donor countries that effectively fund these aid flows (see Milner & Tingley, 2013).


It is fitting, therefore, that two literatures evaluate the allocation of aid among developing countries from a needs perspective. The first assesses donor allocative performance (e.g., Baulch, 2006; Easterly & Pfitze, 2008; McGillivray, 1989, 1992; Nunnenkamp & Thiele, 2006; Rao, 1994, 1997; White, 1992).<sup>1</sup> To these studies, the amount of aid allocated to any given country should be an increasing function of its relative need for aid. Donor performance is assessed against this normative criterion, with performance being an increasing function of the consistency of the allocation of its aid among countries with their relative needs. Some studies also take into account the capacity of recipient countries to use aid to reduce need, recognising that the case to allocate aid to needy countries is diminished in the absence of this capacity. The second category of studies seeks to prescribe the amounts of aid that developing countries should receive according to need (e.g., Collier & Dollar, 2001, 2002; Wood, 2008).<sup>2</sup> Put another way, these studies seek to derive decision rules to guide allocation among recipient countries. Some of these studies also take into account absorptive capacity, as just defined.

This paper seeks to contribute to both literatures: to both assess donor allocative performance and provide an aid allocation decision rule. Aside from explicitly linking these literatures, the paper differs from previous studies through one substantive aspect.<sup>3</sup> Previous studies have used income per capita or income per capita and population as indicators of need. It is reasonable to assume that most would have preferred to use poverty data, given donor statements on aid and voter preferences, if it was not for data availability issues. Noting that the coverage of poverty data has improved considerably in recent years, this paper uses poverty as its indicator of the need for

<sup>1</sup>Clist (2015), McGillivray (2004) and White and McGillivray (1995) provide reviews of this literature.

<sup>2</sup>McGillivray (2004) and Clist (2015) provide reviews of this literature.

<sup>3</sup>Baulch (2006) also uses poverty along with a number of other indicators to assess the allocative performance of donors. This paper uses a much larger sample of countries to assess donor performance and provides explicit aid allocation decision rules based on poverty levels of recipient countries.

	T W E C	12636	WILEY	Dispatch: 13.2.18	CE: Durga Devi S PE: Pravin Kumar A
	Journal Code				
	Manuscript No.				

aid. The allocation decision rule proposed is based on the notion of a fair share of aid based on poverty headcount, one in which the shares of global aid to each recipient country equal each recipient's share of global poverty. The decision rule, and allocative performance index built around it, is designed with a view to simplicity and transparency so that it can inform donor allocation decisions. Notwithstanding, this decision rule satisfies various desirable aid allocation properties identified in the literature.

The paper is structured as follows. Section 2 outlines an index of donor performance, highlighting the allocation decision rule on which it is based. Section 3 discusses data issues, while Section 4 reports the results of calculating the index and departures from fairness to which it points. Section 5 concludes.

## 2 | A “FAIR SHARE” INDEX OF DONOR PERFORMANCE

The “fair share” index is written as follows:

$$P_i = 1 - \sum_{j=1}^n |\Pi_j - \Phi_j| \quad j = 1, \dots, n \quad (1)$$

where  $P_i$  is the allocative performance of donor  $i$ ,  $\Pi_j$  is the share of donor  $i$ 's aid to developing country  $j$ , and  $\Phi_j$  is  $j$ 's share of global poverty. Poverty is defined in terms of a headcount, the number of people in  $j$  with an income below a given international poverty line. The index has a maximum theoretical value of unity, which occurs  $\Pi_j = \Phi_j$  for all  $j$ . Its minimum theoretical value is zero, which occurs if the donor  $i$  allocates the entirety of its aid to a country or countries in which there is no poverty.

Various desirable properties of donor performance indices have been identified in the literature. Perhaps the most fundamental and relevant to (1) is that a regressive allocation should not improve donor performance (White & McGillivray, 1995) and its corollary, vertical equity, that a progressive allocation should improve donor performance (Rao, 1994, 1997). A regressive allocation is one in which the donor takes aid from a poor country and gives it to richer one. A progressive allocation is the opposite. Our fair share index violates this principal, in that taking aid from one country and giving to one with lower poverty need not reduce its value. Taking aid from a poor country and giving it to a rich country will increase the index if this results in their shares of aid being closer to their shares of global poverty. This reflects the defensible proposition that a poor country can be receiving too much aid, and a relatively richer country can be receiving too little. This in turn leads one to question what exactly is a regressive allocation of aid and the corresponding property identified in previous research. This should be viewed as one that results in a deviation from a fair allocation of aid, even if it involves taking aid from a relatively richer country and allocating it to a poorer one. A progressive allocation should be viewed as one which reduces any deviation from the international fair share of aid, as defined above by (1).<sup>4</sup>

<sup>4</sup>Other desirable properties include the following: (i) the performance index should not be maximised by giving all aid to a single recipient; (ii) no anti-concentration bias, in which the index should not penalise donors for failing to give aid to all recipients; (iii) scale neutrality, so that the index should not be affected by the scale of the aid programme; and (iv) horizontal equity, which is satisfied if aid to any two recipients with the same income per capita should be such that the corresponding amount of aid per capita is the same, so that the aid in question is sensitive to recipient country population. The index defined in (1) satisfies each of these properties except (ii), the desirability of which is questionable. It allows a donor to allocate zero aid to the very poorest of countries, but receive no performance penalty for doing so.



Our index is based on four assumptions. The first two are closely aligned: that the average poverty gap in each country is the same and that aid is equally effective at reducing poverty in each country. Both assumptions may be incorrect, but they reflect the empirical reality that there is insufficient information to factor them into the allocation rule. This is particularly so with effectiveness, as is evident from the still unsettled debate in the empirical aid effectiveness literature on whether this effectiveness is conditional on the quality of policies and institutional performance in recipient countries. There is good reason to expect that it is, and this is supported by clear recipient country-specific evidence. Yet there is also evidence that aid has been effective in many countries with low-quality policies and institutional performances, at least in the short to medium term. The key issue for an aid allocation rule is that there is robust quantification of the extent to which policy and institutional performance matters across countries.

The third comment relates to the operational relevance of the decision rule on which Equation (1) is based. We do not propose that donors should rigidly apply the decision rule so that developing countries always receive a fair share as defined. There are plenty of valid country-specific reasons for divergence between actual and fair shares (e.g., the pursuit of foreign policy or strategic objectives in aid allocation). They can also involve humanitarian responses to conditions not reflected in official poverty data, such as refugee crisis, impacts of conflict and natural disasters. They can also involve donor responses to country-specific information on the likely effectiveness of aid.

The fourth comment relates to weighting. The index defined in (1) treats deviations as equally undesirable. Put another way, it sees an under-allocation of aid to a poor country as just as bad as an over allocation to a richer one. It also sees an over allocation to a poor country as just as bad to one to a richer country. This reflects the core thinking of which the index is based in that a poor person in a country with relatively few poor people is just as deserving as support from international donors as a poor person in a country with a greater number of poor people.<sup>5</sup>

### 3 | DATA

Aid data were obtained from the OECD International Development Statistics Database (OECD, 2017). The aid variable used to calculate aid shares was official development assistance (ODA) gross disbursements. Careful consideration was given to the sample of recipient countries. It comprises of all that received ODA in at least 1 year from 2010 onward. ODA data were collected for the period 2010–15, with 2015 being the latest year for which data were available, for the following donors or groups thereof: (i) all ODA donors that report aid data to the OECD-DAC; all donors that are members of the OECD-DAC; (ii) all multilateral donor agencies; (iii) all non-DAC donors; (iv) the EU; and (v) the five largest bilateral donors (in terms of ODA volume) during this period (France, Germany, Japan, the United Kingdom and the United States).<sup>6</sup> In the cases of the DAC members, non-DAC members, the EU, France, Germany, Japan, the United Kingdom and the United States, it is their bilateral ODA flows that were used to calculate aid shares.

<sup>5</sup>Kanbur (2017) makes a very similar point in the context of determining developing country eligibility for aid. He argues that this eligibility ought not be based on the average living standards of a nation, but the number of poor people within it. Kanbur also provides an incisive survey of relevant literature.

<sup>6</sup>Aid flows from China and India are excluded as neither report aid data to the OECD-DAC. Non-DAC donors include Estonia, Israel, Kuwait, Russia, Saudi Arabia and the UAE. It includes many countries that have recently become donors and have in recent decades been aid recipients. Full details can be found in OECD (2017).

Poverty shares were calculated using the World Bank's extreme poverty indicator, the \$1.90 (2011 PPP) poverty headcount, from *World Development Indicators 2017* (World Bank, 2017). Data for this were available for 114 countries. These are countries that had at least one poverty headcount statistic available between 2005 and the latest year for which data on this indicator were available, 2014. In cases in which poverty data could be obtained from a reasonably authoritative alternative source, poverty headcount was estimated using a simple empirical technique.<sup>7</sup> This increased the sample to 144 countries (Appendix A) with ODA to them accounting for between 98% and 100% of total bilateral ODA.

## 4 | RESULTS

Results of calculating the fair share index of donor performance are shown in Table 1. Wide variation in performance is observed, from zero to unity. Interestingly, the overall group performance of the international donor community, assessed using the aggregate of all donor ODA allocations to each of recipient in the 144 countries, is higher than subgroups and of individual donors. This is based on the index score for all donors (0.095). Overall performance of DAC member countries and multilateral agencies is also better than that of each of the seven individual donors. The respective index values for these two groups are 0.079 and 0.060. This might imply an international division of effort among donors, with different donors seeking to respond to the relative needs among recipients delineated by region or other grouping. Verification or otherwise of this would require further research.

By far, the lowest performance is that of the non-DAC group, with a fair share index of  $-0.727$ . As noted above, many in this group of donors have in the recent past been aid recipients. Of our six individual donors, the United Kingdom records the best performance. France displays the worst and the EU the second worst.

**TABLE 1** Fair share index of donor performance

	Index	% of ODA
All donors	0.095	99.46
DAC members	0.079	99.48
Multilateral donors	0.060	99.98
Non-DAC members	$-0.727$	99.98
EU	$-0.234$	99.97
France	$-0.331$	97.99
Germany	$-0.061$	100.00
Japan	$-0.096$	99.96
United Kingdom	0.085	97.97
United States	$-0.106$	100.00

<sup>7</sup>Estimates were obtained by initially estimating an OLS regression of extreme poverty headcount (as a ratio of the total population) on the natural logarithm of \$PPP GNI per capita for those countries for which both variables were available. The estimated values of the intercept and regression coefficient were used to estimate extreme income poverty ratios for those countries for which \$PPP GNI per capita and population but not poverty data were available. These estimated ratios were then multiplied by population levels to finally obtain estimated poverty headcounts.



Table 2 and Figures B1–B10 in Appendix B provide insight into the index scores shown in Table 1. This shows the average difference between global aid and poverty shares by recipient country poverty quintiles for all donors and donor groups. Quintile 1 consists of the poorest countries, those with the highest global poverty shares, while Quintile 5 consists of the richest countries, those with the lowest such shares. The dominant message from Table 2 is a large bias against the poorest countries. The largest bias against these countries is exhibited by the EU, while the lowest is that of the United Kingdom. The biases in aid allocation shown to all other quintiles by all donors are positive, indicating that on average, Quintiles 2–5 have received more that would be considered fair based on global poverty shares. There is one exception, however, the shares of non-DAC donor ODA to Quintile 2, which on average, are less than the shares of global poverty for recipients that belong to this group. Indeed, it would appear that biases against the two poorest country groups, Quintiles 1 and 2, have primarily driven the comparatively very poor performance of the non-DAC donor group.

Figures B1–B10 show the deviation between aid and poverty shares for each individual recipient country ranked by poverty share. The vertical axis is a line of equality, along which aid shares equal poverty shares. They reveal what has driven the bias against the poorest quintile, a substantial bias in aid allocation against India.

India dominates the global share of income poverty, with just under 30% of the world's extremely poor. This is, by a large margin, the largest share of global poverty of any one country. Nigeria and the Democratic Republic of Congo rank second and third, with ten and six per cent, respectively. As shown in Figure B1, the all donor aid group share of aid to India is 26 percentage points less than the latter's share of global poverty. The greatest shortfall in aid to India, compared to its share of global poverty, is exhibited by the non-DAC group (see Figure B4). It is 29 percentage points less than India's share of global poverty. The smallest is Japan, a shortfall of 18 percentage points (see Figure B8). All donor groups and individual donors under consideration significantly under-allocate to India.

Donors will understandably be reluctant to provide such a large share of their aid to a single country, especially one that is a net donor in its own right (The New Indian Express, 2018). Yet as Fuchs and Vadlamannati (2013) note, it is both unsurprising that India still receives aid and puzzling that it has emerged as an aid donor, not only because of its very high poverty level, but

**TABLE 2** Differences between aid and poverty shares by poverty quintile<sup>a</sup>

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
All Donors	−1.161	0.325	0.435	0.188	0.220
DAC Members	−1.086	0.318	0.400	0.181	0.195
Multilateral Agencies	−1.374	0.440	0.492	0.189	0.262
Non-DAC Members	−0.566	−0.313	0.424	0.252	0.210
EU	−1.902	0.065	0.973	0.295	0.588
France	−1.769	0.773	0.616	0.266	0.119
Germany	−0.990	0.092	0.436	0.217	0.254
Japan	−1.009	0.230	0.429	0.256	0.097
United Kingdom	−0.416	0.251	0.039	0.040	0.089
United States	−1.027	0.275	0.422	0.131	0.207

<sup>a</sup>Numbers shown are the mean of  $(\Pi_j - \Phi_j) \times 100$  by poverty quintile.

because it ranks below each of its neighbours in South Asia in terms of life expectancy, access to sanitation, infant immunisation and underweight children. Donors will have a range of valid motives for providing aid to India beyond poverty reduction, yet it would seem difficult to justify such a large gap. It must, though, be acknowledged that this is an extremely difficult issue over which donors need to grapple, with this difficulty made greater by the fact that India is an aid donor in its own right and the related issue of moral hazard.

Another key message from Figures B1–B10 is the incidence of what can be described as “outlier” recipients in addition to India. There are five countries whose aid receipts deviate by at least ten percentage points from their shares of global poverty. Yet unlike India, each receives more than their fair shares. The two largest deviations, of 20% and 32%, are in aid allocations from non-DAC countries. All others come from individual bilateral donors.

Tables C1–C10 provide additional information on deviations from fair shares. This is precisely that the design of the performance index outlined in (1) is intended to provide. And in turn, this is intended to facilitate comparisons that can inform actual aid allocation decision-making. Each table compares actual ODA against that which is considered fair, as obtained by simple multiplication, taking each recipient country’s share of global poverty and multiplying it by the total of each donor or donor group total ODA during the period in question, which is 2010–15.

The information in Tables C1–C10 is for the ten most under-allocated and ten most over-allocated recipient countries. What matters most from a recipient need perspective is all donor support (see Table C1). In addition to India, the two other most under-allocated countries are Nigeria and the Democratic Republic of the Congo. At the other end of the scale, the three most over-allocated countries are Afghanistan, Viet Nam and Turkey. What is interesting is whether the most under- and over-allocated countries also fall into these categories for the donor groups and individual donors in question. This potentially provides insight into the allocative source of the under- and over-allocations at the global level. Of the countries identified in Table 1C in addition to India, Nigeria, the Democratic Republic of Congo, the Democratic People’s Republic of Korea, Bangladesh and Ethiopia are the most consistently under-allocated across these groups and individual donors. Of the over-allocated countries, Viet Nam and West Bank and the Gaza Strip are the most consistently so among these donors and donor groups. This is not to imply that aid allocations to each of these countries are not warranted based on the full range of motives pursued by donors, or in the under-allocated countries on operational challenges of providing aid to them. It does, however, imply donors ought to look closely at these allocations and consider on the basis of the full range of motives they pursue whether the deviations from a fair share based on extreme poverty levels are warranted.

## 5 | CONCLUSION

This paper has assessed donor allocative performance against an aid allocative decision rule. This rule is based on the assumption that a poor person should have an equal right to aid regardless of the number of other poor (or rich) people in their own country. As such, the aid allocative decision rule is based on poverty headcount. Application of this decision rule indicates which countries are receiving a “fair share” of aid based on the number of people in poverty within their country as a proportion of total levels of poverty and compares this to the proportion of aid they receive. Having applied this decision rule, the paper found there is a wider variation in performance. While total aid flows are relatively “fair,” aid flows from DAC members and multilateral donors are less

fairly allocated. When poorer countries are assessed in quintile groups, though, it is evident that the poorest countries receive less aid than is “fair” compared to relatively richer countries.

As this paper uses empirical data, it also demonstrates the dollar value amount by which donors “over”- or “under”-allocate aid to recipient countries. India, Nigeria and the Democratic Republic of Congo were found to be the most under-allocated aid recipients across all DAC donors, while Afghanistan, Viet Nam and Turkey were the most over-allocated.

The findings of this paper will be of value to both donor countries (and multilateral agencies) and recipient countries. Donors will be better placed to understand the fairness of their aid allocation decision-making and either reallocate aid flows or publically justify these allocations to their own citizens (in terms of political, geographic, security or historical justifications), while under-allocated recipient countries will be able to argue for higher allocations based on “fairness.”

## REFERENCES

- Baulch, B. (2006). Aid distribution and the MDGs. *World Development*, 34(6), 933–995. <https://doi.org/10.1016/j.worlddev.2005.11.013>
- Clist, P. (2015). Do performance measures of donors’ aid allocation underperform? *The World Economy*, 38(5), 805–824. <https://doi.org/10.1111/twec.12165>
- Collier, P., & Dollar, D. (2001). Can the world cut poverty in half? How policy reform and effective aid can meet international development goals. *World Development*, 29(11), 1787–1802. [https://doi.org/10.1016/S0305-750X\(01\)00076-6](https://doi.org/10.1016/S0305-750X(01)00076-6)
- Collier, P., & Dollar, D. (2002). Aid allocation and poverty reduction. *European Economic Review*, 46, 1475–1500. [https://doi.org/10.1016/S0014-2921\(01\)00187-8](https://doi.org/10.1016/S0014-2921(01)00187-8)
- Easterly, W., & Pfutze, T. (2008). Where does the money go? Best and worst practices in foreign aid. *Journal of Economic Perspectives*, 22(2), 29–52. <https://doi.org/10.1257/jep.22.2.29>
- Fuchs, A., & Vadlamannati, K. C. (2013). The needy donor: An empirical analysis of India’s aid motives. *World Development*, 44(4), 110–128. <https://doi.org/10.1016/j.worlddev.2012.12.012>
- Kanbur, R. (2017). Citizenship, migration and opportunity. *Journal of Human Development and Capabilities*, 18(4), 429–441. <https://doi.org/10.1080/19452829.2017.1349088>
- McGillivray, M. (1989). The allocation of aid among developing countries: A multidonor analysis using a per capita aid index. *World Development*, 17(4), 561–568. [https://doi.org/10.1016/0305-750X\(89\)90262-3](https://doi.org/10.1016/0305-750X(89)90262-3)
- McGillivray, M. (1992). Reply. *World Development*, 20(11), 1699–1702. [https://doi.org/10.1016/0305-750X\(92\)90025-Q](https://doi.org/10.1016/0305-750X(92)90025-Q)
- McGillivray, M. (2004). Descriptive and prescriptive approaches to aid allocation: Approaches, issues and consequences. *International Review of Economics and Finance*, 13, 275–292. <https://doi.org/10.1016/j.iref.2003.11.005>
- Milner, H., & Tingley, D. (2013). Public opinion and foreign aid: A review essay. *International Interactions*, 39(3), 389–401. <https://doi.org/10.1080/03050629.2013.784090>
- Nunnenkamp, P., & Thiele, R. (2006). Targeting aid to the needy and deserving: Nothing but promises? *The World Economy*, 29(9), 1177–1201. <https://doi.org/10.1111/j.1467-9701.2006.00836.x>
- Rao, J. (1994). Judging givers: Equity and scale in aid allocation. *World Development*, 22(10), 1579–1584. [https://doi.org/10.1016/0305-750X\(94\)90039-6](https://doi.org/10.1016/0305-750X(94)90039-6)
- Rao, J. (1997). Ranking foreign donors: An index combining the scale and equity of aid giving. *World Development*, 25(6), 947–961. [https://doi.org/10.1016/S0305-750X\(97\)00001-6](https://doi.org/10.1016/S0305-750X(97)00001-6)
- The New Indian Express (2018). *Emerging power India gives more aid than it receives*. January 7
- White, H. (1992). The allocation of aid among developing countries: A comment on McGillivray’s performance index. *World Development*, 20(11), 1697–1698. [https://doi.org/10.1016/0305-750X\(92\)90024-P](https://doi.org/10.1016/0305-750X(92)90024-P)
- White, H., & McGillivray, M. (1995). How well is aid allocated? Descriptive measures of aid allocation: A survey of methodology and results. *Development and Change*, 26(1), 163–183. <https://doi.org/10.1111/j.1467-7660.1995.tb00547.x>
- Wood, A. (2008). Looking ahead optimally in allocating aid. *World Development*, 36(7), 1135–1151. <https://doi.org/10.1016/j.worlddev.2007.08.002>

**How to cite this article:** McGillivray M, Clarke M. Fairness in the international allocation of development aid. *World Econ.* 2018;00:1–19. <https://doi.org/10.1111/twec.12636>

## APPENDIX A

### RECIPIENT COUNTRY SAMPLE

Afghanistan <sup>a</sup>	Ghana	Pakistan
Albania	Grenada	Palau <sup>a</sup>
Algeria <sup>a</sup>	Guatemala	Panama
Angola	Guinea	Papua New Guinea
Antigua and Barbuda	Guinea-Bissau	Paraguay
Argentina	Guyana <sup>a</sup>	Peru
Armenia	Haiti	Philippines
Azerbaijan	Honduras	Rwanda
Bangladesh	India	Samoa <sup>a</sup>
Barbados	Indonesia	Sao Tome and Principe
Belarus	Iran, Islamic Rep.	Senegal
Belize	Iraq <sup>a</sup>	Serbia
Benin	Jamaica <sup>a</sup>	Seychelles
Bhutan	Jordan <sup>a</sup>	Sierra Leone
Bolivia	Kazakhstan	Solomon Islands <sup>a</sup>
Bosnia and Herzegovina	Kenya <sup>a</sup>	Somalia
Botswana	Kiribati	South Africa
Brazil	Korea, Dem. People's Rep. <sup>a</sup>	South Sudan
Burkina Faso	Kosovo	Sri Lanka
Burundi <sup>a</sup>	Kyrgyz Republic	St. Kitts and Nevis <sup>a</sup>
Cabo Verde	Lao PDR	St. Lucia <sup>a</sup>
Cambodia	Lebanon <sup>a</sup>	St. Vincent and the Grenadines
Cameroon	Lesotho	Sudan
Central African Republic <sup>a</sup>	Liberia	Suriname
Chad	Libya <sup>a</sup>	Swaziland
Chile	Macedonia, FYR <sup>a</sup>	Syrian Arab Republic
China	Madagascar	Tajikistan
Colombia	Malawi	Tanzania

(Continues)



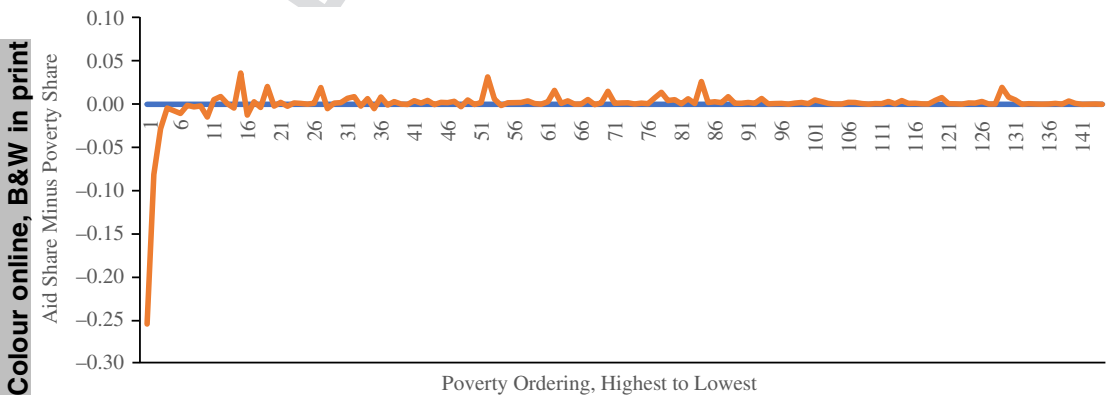
# APPENDIX A (Continued)

Comoros <sup>a</sup>	Malaysia	Thailand
Congo, Dem. Rep.	Maldives	Timor-Leste
Congo, Rep.	Mali	Togo
Costa Rica	Marshall Islands	Tonga
Cote d'Ivoire	Mauritania	Trinidad and Tobago
Croatia	Mauritius	Tunisia
Cuba	Mexico	Turkey
Djibouti	Micronesia, Fed. States	Turkmenistan <sup>a</sup>
Dominica <sup>a</sup>	Moldova	Tuvalu
Dominican Republic	Mongolia	Uganda
Ecuador	Montenegro	Ukraine
Egypt, Arab Rep. <sup>a</sup>	Morocco	Uruguay
El Salvador	Mozambique	Uzbekistan <sup>a</sup>
Equatorial Guinea	Myanmar <sup>a</sup>	Vanuatu
Eritrea <sup>a</sup>	Namibia	Venezuela, RB <sup>a</sup>
Ethiopia	Nepal	Vietnam
Fiji	Nicaragua	West Bank and Gaza
Gabon	Niger	Yemen, Rep. <sup>a</sup>
Gambia, The <sup>a</sup>	Nigeria	Zambia
Georgia	Oman <sup>a</sup>	Zimbabwe

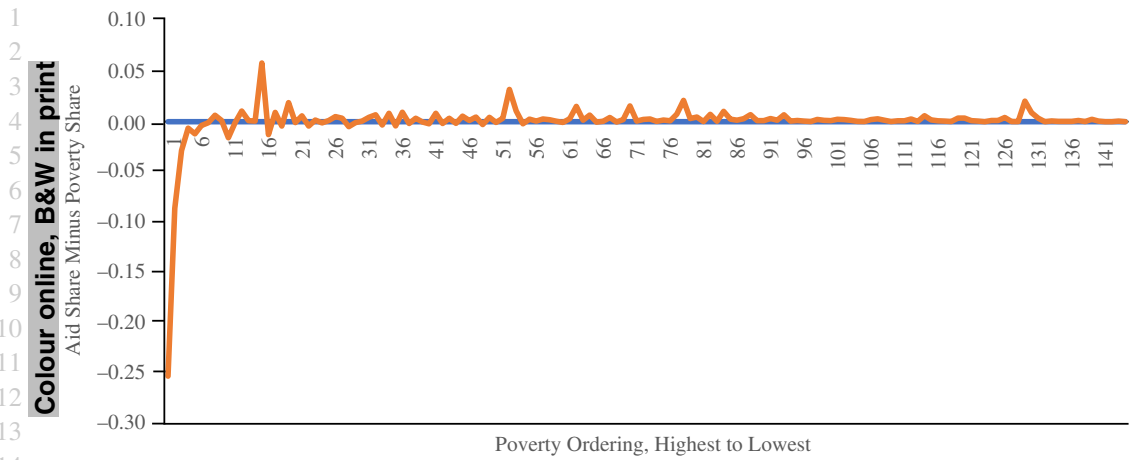
<sup>a</sup>Indicates that poverty data were estimated.

## APPENDIX B

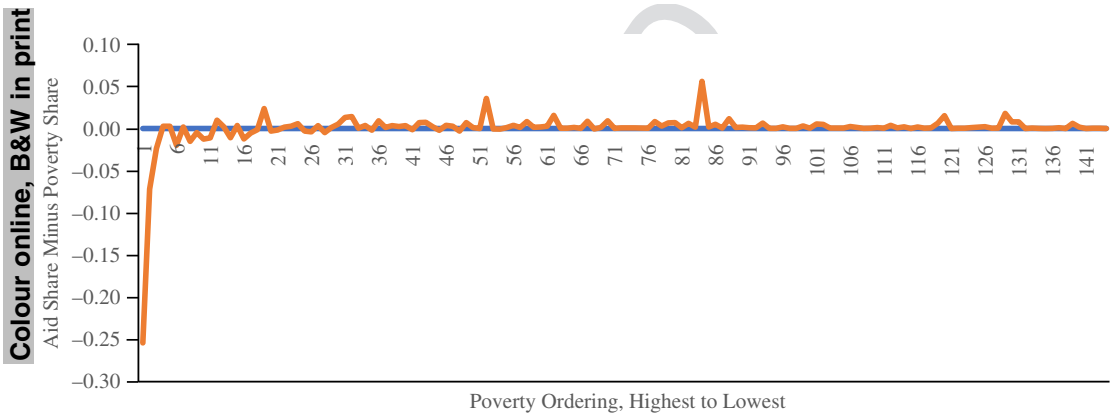
### ACTUAL MINUS FAIR AID CHARTS



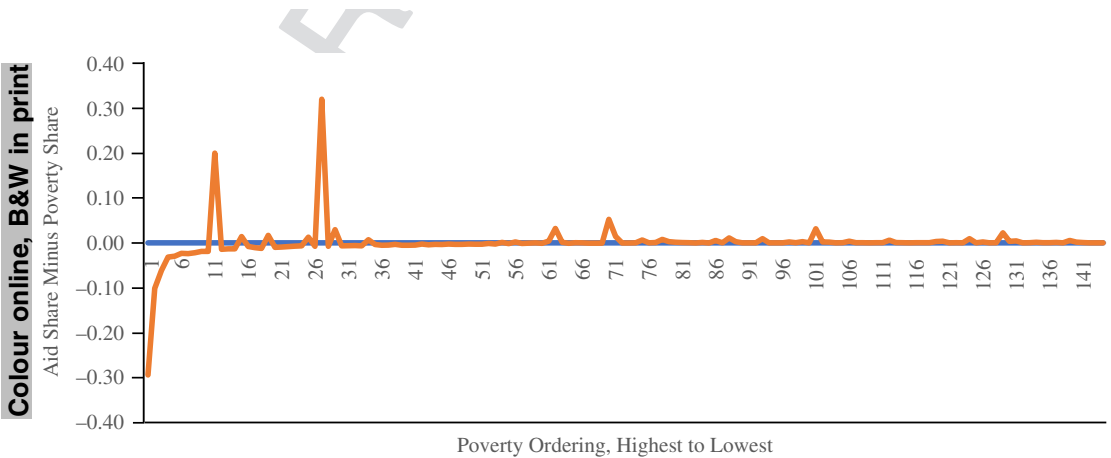
**FIGURE B1** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), all donors, 2010–15



**FIGURE B2** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), DAC members, 2010–15



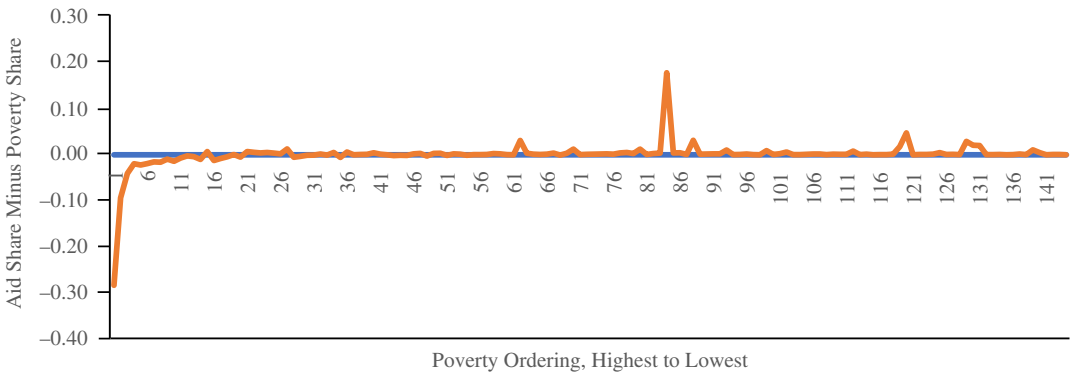
**FIGURE B3** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), multilateral agencies, 2010–15



**FIGURE B4** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), non-DAC members, 2010–15

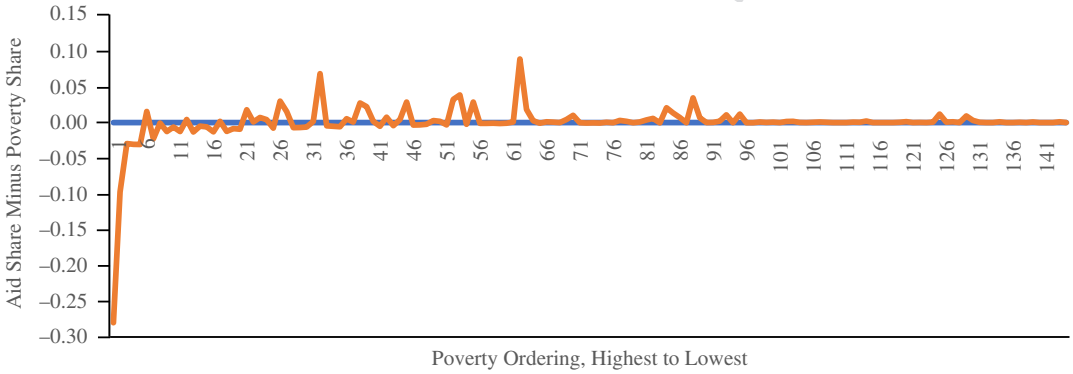


Colour online, B&W in print



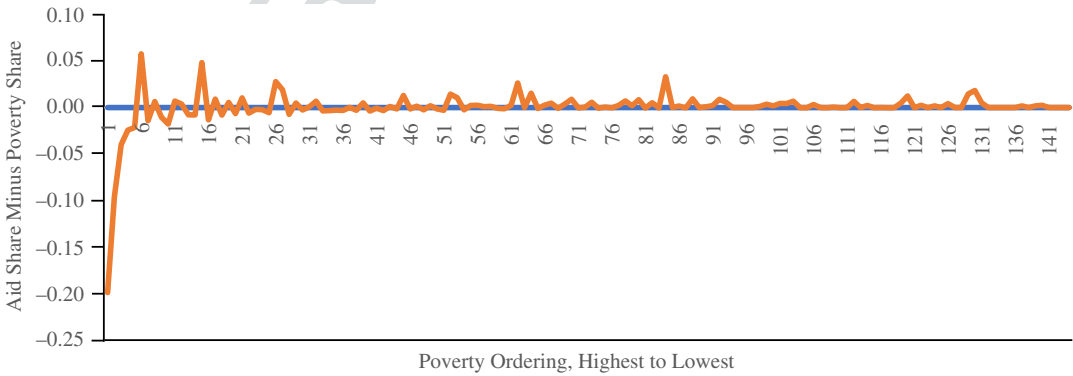
**FIGURE B5** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), EU, 2010–15

Colour online, B&W in print



**FIGURE B6** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), France, 2010–15

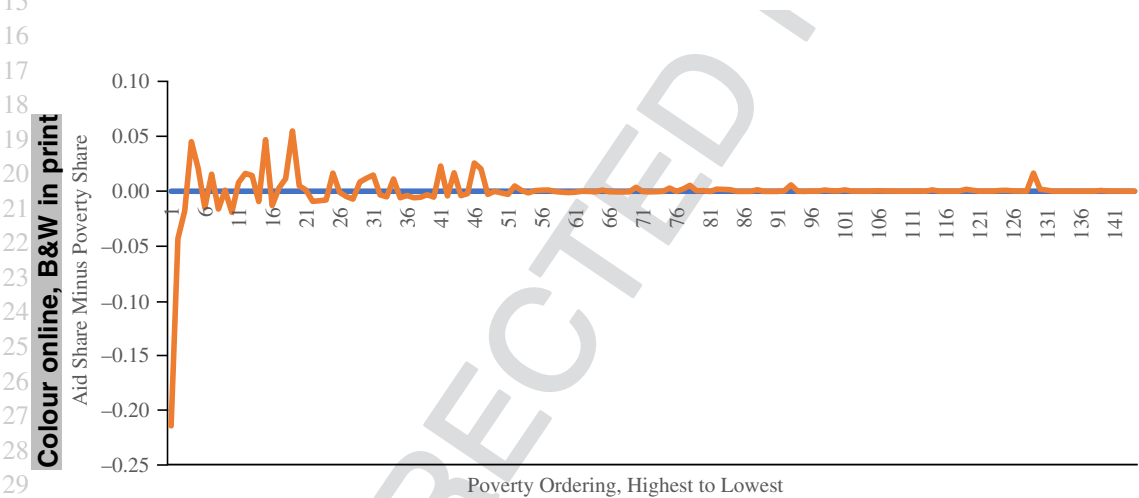
Colour online, B&W in print



**FIGURE B7** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), Germany, 2010–15



**FIGURE B8** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), Japan, 2010–15



**FIGURE B9** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), United Kingdom, 2010–15



**FIGURE B10** Differences between aid and poverty shares ( $\Pi_j - \Phi_j$ ), United States, 2010–15





## APPENDIX C

## DEPARTURE OF ACTUAL FROM FAIR AID ALLOCATIONS

**TABLE C1** Ten most under- and over-allocated recipient countries, all donors 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	25,900	194,033	–168,133
Nigeria	13,183	66,959	–53,776
Democratic Republic of the Congo	21,990	40,724	–18,734
Madagascar	3,166	12,946	–9,781
Democratic People's Republic of Korea	612	8,829	–8,218
China (People's Republic of)	10,854	17,809	–6,955
Bangladesh	15,806	20,788	–4,982
Uzbekistan	765	4,133	–3,368
Angola	1,807	5,151	–3,344
Ethiopia	20,055	22,946	–2,891
Kenya	16,113	10,157	5,956
Iraq	9,433	273	9,160
Jordan	10,350	408	9,943
Morocco	11,428	747	10,682
Egypt	18,129	5,302	12,827
West Bank and Gaza Strip	12,930	3	12,926
Pakistan	21,500	7,925	13,574
Turkey	17,547	181	17,366
Viet Nam	22,855	1,959	20,896
Afghanistan	32,783	8,886	23,897

**TABLE C2** Ten most under- and over-allocated recipient countries, DAC Members 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	16,204	114,043	–97,839
Nigeria	6,037	39,355	–33,318
Democratic Republic of the Congo	12,822	23,935	–11,113
Madagascar	1,430	7,609	–6,180
Democratic People's Republic of Korea	195	5,190	–4,994
Bangladesh	7,545	12,218	–4,673
Ethiopia	10,987	13,487	–2,499
Angola	1,106	3,027	–1,922
Malawi	3,210	4,910	–1,700

(Continues)

TABLE C2 (Continued)

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
Niger	1,952	3,623	−1,670
Turkey	4,061	106	3,955
Kenya	10,043	5,970	4,073
Colombia	5,278	1,126	4,152
Morocco	6,321	439	5,883
Jordan	6,251	240	6,012
Pakistan	11,979	4,658	7,321
West Bank and Gaza Strip	7,873	2	7,871
Iraq	8,352	160	8,191
Viet Nam	13,545	1,151	12,393
Afghanistan	27,778	5,223	22,555

TABLE C3 Ten most under- and over-allocated recipient countries, multilateral agencies 2010–15, \$US millions, constant 2015 prices

Multilateral agencies	Actual ODA	Fair ODA	Actual minus fair ODA
India	9,682	70,478	−60,797
Nigeria	7,137	24,321	−17,184
Democratic Republic of the Congo	9,154	14,792	−5,638
China (People's Republic of)	1,722	6,469	−4,746
Indonesia	1,723	5,380	−3,657
Madagascar	1,718	4,703	−2,985
Democratic People's Republic of Korea	239	3,207	−2,968
Syrian Arab Republic	1,195	3,849	−2,654
Philippines	703	3,331	−2,628
Myanmar	1,937	3,199	−1,262
Kenya	6,035	3,689	2,346
Tunisia	2,839	56	2,783
Ghana	4,851	1,729	3,122
Côte d'Ivoire	5,048	1,648	3,400
Serbia	3,647	3	3,643
Morocco	4,004	271	3,733
West Bank and Gaza Strip	4,307	1	4,306
Pakistan	8,562	2,879	5,683
Viet Nam	9,260	712	8,549
Turkey	13,445	66	13,380



**TABLE C4** Ten most under- and over-allocated recipient countries, non-DAC members 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	14	9,847	−9,833
Nigeria	8	3,398	−3,390
Democratic Republic of the Congo	13	2,067	−2,053
Ethiopia	98	1,164	−1,067
Bangladesh	62	1,055	−993
Tanzania	63	865	−801
China (People's Republic of)	123	904	−781
Indonesia	11	752	−741
Madagascar	18	657	−639
Mozambique	37	670	−633
Afghanistan	921	451	470
Cuba	495	20	475
Pakistan	959	402	556
West Bank and Gaza Strip	750	0	749
Yemen	1,232	259	973
Kyrgyzstan	1,050	3	1,047
Morocco	1,103	38	1,065
Jordan	1,763	21	1,742
Syrian Arab Republic	7,212	538	6,674
Egypt	10,954	269	10,685

**TABLE C5** Ten most under- and over-allocated recipient countries, European Union 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	750	21,418	−20,668
Nigeria	563	7391	−6,828
Democratic Republic of the Congo	1,536	4,495	−2,959
Bangladesh	679	2,295	−1,616
Ethiopia	1,119	2,533	−1,414
China (People's Republic of)	573	1,966	−1,393
Indonesia	452	1,635	−1,183
Tanzania	737	1,881	−1,144
Madagascar	403	1,429	−1,026
Democratic People's Republic of Korea	58	975	−916
Georgia	922	28	894
Egypt	1,515	585	930

(Continues)

TABLE C5 (Continued)

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
Kosovo	1,299	1	1,298
Bosnia and Herzegovina	1,457	0	1,456
Ukraine	1,509	0	1,509
West Bank and Gaza Strip	2,129	0	2,129
Morocco	2,350	82	2,268
Tunisia	2,296	17	2,279
Serbia	3,458	1	3,457
Turkey	13,010	20	12,990

TABLE C6 Ten most under- and over-allocated recipient countries, France 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	501	10,274	−9,774
Nigeria	163	3,546	−3,383
Bangladesh	31	1,101	−1,070
Ethiopia	155	1,215	−1,060
Democratic Republic of the Congo	1,133	2,156	−1,023
Tanzania	116	902	−787
Uganda	31	489	−458
Democratic People's Republic of Korea	18	468	−449
Syrian Arab Republic	123	561	−438
Mozambique	263	699	−436
Cameroon	980	204	776
Senegal	1,168	208	960
Congo	1,064	62	1,002
Mexico	1,144	142	1,002
Brazil	1,333	282	1,051
Viet Nam	1,232	104	1,129
Tunisia	1,216	8	1,208
Colombia	1,454	101	1,352
Côte d'Ivoire	2,629	240	2,389
Morocco	3,144	40	3,104



**TABLE C7** Ten most under- and over-allocated recipient countries, Germany 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	4,096.81	1,2615.82	−8,519.01
Nigeria	245.64	4,353.59	−4,107.95
Democratic Republic of the Congo	940.85	2,647.82	−1,706.97
Ethiopia	455.82	1,491.93	−1,036.11
Bangladesh	437.46	1,351.60	−914.14
Madagascar	90.53	841.77	−751.24
Tanzania	505.55	1,107.91	−602.36
Democratic People's Republic of Korea	14.93	574.08	−559.15
Mozambique	414.69	858.29	−443.60
Malawi	197.59	543.12	−345.53
Viet Nam	746.80	127.37	619.43
West Bank and Gaza Strip	629.12	0.22	628.90
Peru	706.17	44.48	661.69
Ukraine	788.10	0.21	787.89
Egypt	1,167.01	344.74	822.27
Morocco	1,181.84	48.55	1,133.29
Brazil	1,543.03	346.03	1,197.00
Turkey	1,429.19	11.74	1,417.45
Afghanistan	2,650.98	577.77	2,073.21
China (People's Republic of)	3,636.62	1,157.90	2,478.72

**TABLE C8** Ten most under- and over-allocated recipient countries, Japan 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	7,385	18,197	−10,812
Nigeria	227	6,279	−6,053
Democratic Republic of the Congo	1,119	3,819	−2,700
Ethiopia	477	2,152	−1,675
Madagascar	210	1,214	−1,005
Syrian Arab Republic	115	994	−878
Tanzania	737	1,598	−861
Mozambique	390	1,238	−848
Democratic People's Republic of Korea	0	828	−828
Malawi	201	783	−583
Malaysia	659	6	654
Turkey	1,243	17	1,226

(Continues)

TABLE C8 (Continued)

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
Philippines	2,254	860	1,393
Sri Lanka	1,605	26	1,579
Thailand	1,621	2	1,619
Iraq	1,879	26	1,854
Afghanistan	2,904	833	2,071
Indonesia	4,207	1,389	2,818
Myanmar	5,128	826	4,302
Viet Nam	7,621	184	7,437

TABLE C9 Ten most under- and over-allocated recipient countries, United Kingdom 2010–15, \$US millions, constant 2015 prices

United Kingdom	Actual ODA	Fair ODA	Actual minus fair ODA
India	2,939.49	10,830.32	−7,890.83
Nigeria	2,144.47	3,737.43	−1,592.96
Madagascar	10.66	722.63	−711.97
Democratic Republic of the Congo	1,612.79	2,273.08	−660.29
Indonesia	226.25	826.78	−600.53
China (People's Republic of)	437.69	994.02	−556.33
Democratic People's Republic of Korea	6.23	492.83	−486.60
Philippines	164.23	511.88	−347.65
Niger	4.21	344.02	−339.81
Mali	8.40	331.41	−323.01
Somalia	909.65	302.39	607.26
West Bank and Gaza Strip	610.04	0.19	609.85
Nepal	784.95	166.34	618.61
Zimbabwe	880.38	128.50	751.88
Bangladesh	1,927.45	1,160.31	767.14
South Sudan	1,045.19	200.36	844.83
Sierra Leone	1,079.49	130.16	949.33
Ethiopia	2,942.99	1,280.78	1,662.21
Afghanistan	2,224.33	496.00	1,728.33
Pakistan	2,467.29	442.37	2,024.92



**TABLE C10** Ten most under- and over-allocated recipient countries, United States 2010–15, \$US millions, constant 2015 prices

Recipient country	Actual ODA	Fair ODA	Actual minus fair ODA
India	645	34,646	–34,000
Nigeria	2,895	11,956	–9,061
Democratic Republic of the Congo	4,012	7,271	–3,259
China (People's Republic of)	307	3,180	–2,873
Bangladesh	1,188	3,712	–2,524
Madagascar	485	2,312	–1,827
Democratic People's Republic of Korea	17	1,577	–1,560
Indonesia	1,404	2,645	–1,241
Myanmar	384	1,573	–1,189
Brazil	163	950	–787
Colombia	2,098	342	1,756
South Africa	3,043	1,128	1,915
Sudan	3,223	740	2,483
Haiti	3,397	718	2,679
Kenya	4,689	1,814	2,875
West Bank and Gaza Strip	3,525	1	3,524
Jordan	4,042	73	3,969
Pakistan	5,571	1,415	4,156
Iraq	4,940	49	4,892
Afghanistan	14,777	1,587	13,190