

A Service of



Leibniz-Informationszentrum Wirtschaft Leibniz Information Centre for Economics

Eger, Jens; Öhler, Hannes; Rudolph, Alexandra

Working Paper Is the sectoral aid allocation within countries needoriented?

Discussion Paper, No. 17/2018

Provided in Cooperation with: German Institute of Development and Sustainability (IDOS), Bonn

Suggested Citation: Eger, Jens; Öhler, Hannes; Rudolph, Alexandra (2018) : Is the sectoral aid allocation within countries need-oriented?, Discussion Paper, No. 17/2018, ISBN 978-3-96021-073-3, Deutsches Institut für Entwicklungspolitik (DIE), Bonn, https://doi.org/10.23661/dp17.2018

This Version is available at: https://hdl.handle.net/10419/199537

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



WWW.ECONSTOR.EU





Deutsches Institut für Entwicklungspolitik German Development Institute

Discussion Paper

17/2018

Is the Sectoral Aid Allocation within Countries Need-Oriented?

Jens Eger Hannes Öhler Alexandra Rudolph

Is the sectoral aid allocation within countries need-oriented?

Jens Eger

Hannes Öhler

Alexandra Rudolph

Bonn 2018

Discussion Paper / Deutsches Institut für Entwicklungspolitik ISSN 1860-0441

Die deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.d-nb.de abrufbar.

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the Internet at http://dnb.d-nb.de.

ISBN 978-3-96021-073-3 (printed edition)

DOI:10.23661/dp17.2018

Printed on eco-friendly, certified paper

Jens Eger is an evaluator at the German Institute for Development Evaluation, DEval (Deutsches Evaluierungsinstitut der Entwicklungszusammenarbeit). He worked for the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) as an intern and consultant.

Dr Hannes Öhler is a researcher in the research programme "Inter- and Transnational Cooperation" of the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).

Email: Hannes.oehler@die-gdi.de

Dr Alexandra Rudolph is an employee at the Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung). During the time that she contributed to this paper, she was a researcher at the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).



Abstract

The paper focuses on an important dimension of donor aid allocation, which has largely been neglected in the empirical literature: the need orientation of donors when deciding on the sectoral composition of their recipient country portfolios. Employing sector-specific need indicators in logit and zero-one inflated beta estimations our results show that the degree of need orientation of donors depends on the sector. While in the sectors of governance, transport, environment protection, sexually transmitted diseases control including HIV/AIDS and emergency response, the analysis clearly points to a need-based allocation of resources, it is striking that need considerations seem not to play a role in the health and water and sanitation sectors. Remarkably, we find evidence for donor coordination within countries, in that donors took other donors' sector activities into account when deciding on the sectoral composition of their country portfolios.

Contents

Abstract

Abbreviations

1	Introduction	1
2	Data, stylised facts and method	3
3	Results	5
4	Conclusion	7
Reference	es	9
Tables		11
Table 1:	Distribution of ODA across sectors by all bi- and multilateral DAC-donors (%)	11
Table 2:	Distribution of ODA across sectors by the five largest bilateral donors and the two main multilateral donors (EU and IDA) in 2000-2015 (%)	11
Table 3:	Logit estimations for the 15 largest bilateral donors and the two main multilateral donors (EU and IDA)	12
Table 4:	Zero-one inflated beta estimations with the 15 largest bilateral donors and the two main multilateral donors (EU and IDA)	13
Appendix		
Table A.1	: Definition of variables and data sources	14

Abbreviations

CO ₂	carbon dioxide
CRS	Creditor Reporting System
DAC	Development Assistance Committee
EU	European Union
GDP	gross domestic product
IDA	International Development Association
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goal
STD	sexually transmitted disease

1 Introduction

Recent studies on the allocation and effectiveness of aid provide evidence for aid being more effective if allocated according to need rather than political motives (Dreher, Eichenauer, & Gehring, 2018; Dreher, Klasen, Vreeland, & Werker, 2013). So far the question of how need-oriented aid has been allocated has mainly been investigated by looking at the cross-country allocation of aid (e.g. Alesina & Dollar, 2000). However, two important aspects are not considered in these studies. First, the geographical allocation of aid within recipient countries matters in terms of need orientation: does aid flow to the regions where the poor and needy are located or is aid rather concentrated in economic centres, where it is more easily implemented and more visible? Few studies deal with this question, while those that do arrive at rather discouraging results (Briggs, 2017, 2018; Nunnenkamp, Öhler, & Sosa Andres, 2017; Öhler, Negre, Smets, Massari, & Bogetic, 2017; Öhler & Nunnenkamp, 2014).

The second important aspect of donors' need orientation, which has largely been neglected in the empirical literature and is the focus of this paper, is the question of to what extent donors take sector-specific needs into account when deciding on the sectoral composition of their country aid portfolios. Arguably, donors can help achieve the Sustainable Development Goals (SDGs) of the 2030 Agenda by focusing on the areas where the respective recipient country still lags far behind the targets. Previously, Thiele, Nunnenkamp and Dreher (2007, p. 598) pointed out that the scant attention which the sectoral composition of aid has received "is surprising once it is taken into consideration that the sectoral composition of aid should have an important say on whether or not donors help achieving MDGs [Millennium Development Goals] other than the general target of halving absolute poverty".

In line with Öhler et al. (2017), assessing donors' sectoral allocation of aid within countries with respect to needs requires the consideration of a number of caveats. First of all, donors' within-country allocations are influenced by recipient country preferences and, therefore, not entirely at the donors' own discretion. Related to this, aid has been found to be (at least partly) fungible across sectors at country level (Collier & Dollar, 2002; Feyzioglu, Swaroop, & Zhu, 1998; Pack & Pack, 1993).¹ Insofar as aid is fungible, donors may not be able to target specific sectors where need is most urgent. Whether donors use information or not on the government's budgetary allocation is likely to affect the sectoral aid composition displayed by donors. However, causality may run in both directions. The government may adapt its allocation in response to that of the international donor community or the other way around, with donors allocating aid to those sectors where the government investments relative to needs are lowest.² Furthermore, not all aid modalities are meant to target specific sectors within countries. In particular, general budget support cannot be attributed to specific sectors and is, therefore, not considered in this study.

¹ Van de Sijpe (2013), however, finds limited fungibility in the case of education and health aid in the form of technical cooperation.

² In a robustness test, we account for government expenditure in the health and education sector. Data limitations, however, prevent us from considering this variable for the other sectors.

Importantly, efficiency concerns may play a role in deciding the sectoral allocation of development assistance. That is, it may be inefficient to invest in sectors where the expected returns to aid are low (Dillinger, 2007), and this may lead to very different sectoral aid allocations than those solely based on needs (Carter, 2014). Related to this, the bureaucratic capacity and the quality of governance may vary substantially across sectors, implying different costs of implementation and different returns to aid. In addition, assessing the sectoral within-country aid allocation of donors by looking at the needs in the different sectoral aid allocation patterns may have different effects on economic co-benefits, such as increased growth.

Within recipient countries, aid fragmentation and lack of donor coordination pose important challenges: well documented are the high transaction costs associated with fragmented aid (Negre & Klingebiel, 2016) and the negative impact of fragmentation on bureaucratic quality (Knack & Rahman, 2007), growth (e.g. Kimura, Mori, & Sawada, 2012) and aid tying (Knack & Smets, 2013).³ Indeed, the international development community has committed themselves to better coordination on numerous occasions – the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action, and the Busan Partnership for Effective Development Cooperation – although with limited results (Nunnenkamp, Öhler, & Thiele, 2013). Nevertheless, we assess donor coordination within countries, that is whether donors take other donors' aid activities into account when deciding on the sectoral composition of their country aid portfolios.

In our empirical analysis, we draw on sectorally disaggregated official development assistance (ODA) data of the 15 largest bilateral Development Assistance Committee (DAC)-donors (in terms of the absolute size of their ODA budgets) and the two main multilateral donors (the European Union (EU) and the World Bank's International Development Association (IDA)) for 2000-2015.⁴ We use two dependent variables: the first one is a binary variable equal to one if a donor is engaged in a given sector in a given recipient country. Importantly, we also control for a donor's overall aid funds to a recipient country because a higher aid budget is expected to typically spread over a higher number of sectors. The second dependent variable we employ is a donor's sector-specific share in its overall aid budget to a recipient country. We use this variable, rather than sector-specific aid amounts, in order to focus exclusively on the donors' decisions on the sectoral composition of their country budgets.⁵ We focus on 10 aid sectors and employ one need indicator for each sector as our variable of interest in order to estimate the degree of need orientation in the different sectors.⁶

³ However, Gehring, Michaelowa, Dreher and Spörri (2017) find no systematic negative effect of aid fragmentation on the effectiveness of aid.

⁴ In order to classify aid flows according to sectors we use the Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System (CRS) purpose codes.

⁵ The amount of aid a donor allocates to a specific sector in a recipient country is determined, partly, by the decision on the overall aid volume the respective recipient country receives and, partly, by the decision as to how the previously decided aid budget is allocated across the different sectors.

⁶ See Section 2 on the sectors and the corresponding need indicators employed.

Our results show that the degree of need orientation of donors depends on the sector. In the sectors of governance, transport, environment protection, sexually transmitted diseases (STD) control including HIV/AIDS⁷ and emergency response, the analysis clearly indicates that the needs in these sectors play a significant role in whether donors decide to engage in these sectors and in the share of aid funds (of the overall country budget) they receive. However, it is striking that need considerations seem not to play a role in the health and water and sanitation sectors. On the positive side, our results show that donors typically take other donors' aid activities into account when deciding on the sectoral composition of their country portfolios.

Our paper proceeds as follows: Section 2 describes the data and method employed, while we present our results in Section 3; we conclude with a summary and discussion of our findings in Section 4.

2 Data, stylised facts and method

The data on ODA come from the Creditor Reporting System (CRS) database provided by the Organisation for Economic Co-operation and Development (OECD) DAC. The database contains detailed information on the sector-specific aid allocation of donors. As mentioned previously, we focus on the 15 largest bilateral DAC-donors and the two main multilateral donors (EU and IDA).⁸ With respect to aid sectors, we chose those which account for a considerable share of overall aid and for which we were able to identify meaningful need indicators. These sectors and the corresponding (preferred) need indicators are: education (primary school enrolment); health (under-five mortality); water supply and sanitation (access to improved water source); government and civil society (control of corruption); transport and storage (paved roads); energy (access to electricity); agriculture, forestry and fishing (agricultural land); general environmental protection (carbon dioxide (CO₂) emissions); STD control including HIV/AIDS (HIV prevalence); and emergency response (disaster-related deaths).⁹ Our analysis covers the 2000-2015 period.

Before introducing our method, we present some stylised facts on the sectoral composition of donors' aid portfolios. Table 1 shows how the sectoral composition of aid developed from 2000 until 2015. While the share of aid provided for economic infrastructure projects (transport, energy) increased over time, the trend in the social infrastructure sectors is more ambiguous. We see a slight decline in the share of aid going to the education sector. In contrast, the share of aid for water and sanitation increased slightly and the increase in health

^{7 &}quot;STD control including HIV/AIDS" is a subsector of "Population policies/programmes and reproductive health". However, as STD control including HIV/AIDS constitutes 70.6 per cent of the sector and in order to use relevant need indicators which match the sectors employed, we decided to use the subsector in this case.

⁸ The 15 bilateral DAC-donors are Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States. These donor countries, plus the two multilateral donors, accounted for over 95 per cent of the overall DAC aid budget in 2000-2015.

⁹ Taken together, they represent 58.4 per cent of total aid in 2000-2015. See Appendix for the complete list of the need indicators, the exact definitions and the data sources.

aid is even more pronounced. Interestingly, the importance of governance and civil society increased until the 2008-2011 period, but decreased in more recent years. Aid for HIV/AIDS shows a similar trajectory, with a steep increase until 2008-2011. As expected, the aid share for environmental protection increased over time. Finally, a steady increase can also be observed in the share of humanitarian aid.

Table 2 shows the sectoral composition over the whole 2000-2015 period for the five highest contributing bilateral donors and the two multilateral donors. The figures reveal relatively pronounced differences in the donors' emphasis on the various aid sectors. While France and Germany clearly put most emphasis on education, Japan stands out when it comes to the share of aid for water and sanitation and transport. Health is not that important for any of the donors, with the United Kingdom (UK) and IDA having the highest share (below 8 per cent). In contrast, we see large differences among the donors in the case of governance and civil society: while the sector does not figure highly in the aid budgets of France and Japan (the share is below 2 per cent), the United States (US), IDA and the UK spend a significant share of their funds in that sector (above 13 per cent). When it comes to the fight against STDs including HIV/AIDS and emergency response, the US clearly stands out with respect to the share of aid money spent for these purposes.

While these figures are informative for a general assessment of donors' development foci, they cannot tell us anything about the need orientation of donors when it comes to the sectoral composition of their country portfolios. For this purpose, we need to rely on a more sophisticated empirical estimation strategy, which consists of two parts. In the first part, we analyse whether donors' selection of aid sectors in recipient countries is according to needs. For this purpose, we estimate a logit model where the dependent variable is a dummy variable (*Aid*) set equal to one if donor i is engaged in sector s in recipient country r in period t.

In the second part, we examine the need orientation of donor budgets in recipient countries. Thus, the dependent variable is the share of aid allocated by donor i towards sector s in recipient country r in period t (*Aid share*). Sector shares are used rather than sector-specific aid amounts to focus exclusively on donors' sectoral aid allocation decisions within countries. We estimate a zero-one inflated beta regression, because the dependent variable is bound between zero and one and has positive probability masses at both extremes, especially at zero.¹⁰ Because of the high volatility of aid, we average our dependent as well as our independent variables over four year periods. In line with previous studies, we use aid commitments, rather than disbursements, because donors are expected to exert more control over this variable (Neumayer, 2003).

The estimation equations are as follows:

 $Aid_{irts} = \beta_0 + \beta_1 need_{rts} + \beta_2 ODA of other donors_{irts} + \beta_3 X'_{rt} + ODA_{irt} + \delta_i + \eta_r + \theta_t + \varepsilon_{irt}$ (1)

Aid Share_{irts} = $\beta_0 + \beta_1 need_{rts} + \beta_2 ODA$ of other donos_{irts} + $\beta_3 X'_{rt} + ODA_{irt} + \delta_i + \eta_r + \theta_t + \varepsilon_{irt}$ (2)

where *need* is our variable of interest (i.e. the sector-specific need indicators). *ODA of other donors* represents the log of total ODA allocated to the specific sector in

¹⁰ See, for example, Ospina and Ferrari (2012). We use Maarten Buis' "zoib" estimator in Stata.

the respective recipient country by other bi- and multilateral DAC donors. By including this variable, we can test whether donors take other donors' activities in the respective sector into account when deciding on their engagement in the sector. X' is a vector of standard control variables in the aid allocation literature (the log of gross domestic product (GDP) per capita, the log of the population and control of corruption). With respect to our analysis, the level of development, the size and the quality of governance of a recipient country may influence donors' decisions on which sectors to engage in. Importantly, we account for total ODA of the donor allocated to the specific recipient country (ODA_{irt}) in all estimations because a larger budget can be expected to spread, on average, over a larger number of sectors. In addition, we include recipient country (δ_i), donor (η_r) and period fixed effects (θ_t). Standard errors are clustered at the level of recipient countries.

In our estimation strategy, we introduce the explanatory variables mentioned above in a stepwise process. In a first specification, we introduce the sector-specific need indicator and the log of the overall ODA allocated by a donor to a specific recipient country in a given period. In a second specification, sector-specific ODA of other donors is included, and in a third specification, GDP per capita, population and control of corruption are included as additional control variables.

3 Results

Logit estimations

In the first part of our econometric analysis, we investigate whether donors' selection of aid sectors in recipient countries has been need-oriented. For this purpose, we perform sector-specific logit estimations with a dummy variable as the dependent variable, which takes the value of one if a donor has been active in a given sector in a given recipient country and period. The logit estimations in Table 3 include the sector-specific need indicator and total ODA of the donor to the respective recipient country as explanatory variables. In addition, we introduce the log of sector-specific ODA of other donors in column (2) and other control variables in column (3) (GDP per capita, population and control of corruption).

The results in Table 3 show robust evidence of need orientation for some sectors: education, STD control including HIV/AIDS and emergency response.¹¹ For instance, the significant and negative coefficient of primary school enrolment suggest that a higher percentage of primary school enrolment leads to a lower likelihood of donors engaging in the education sector. With respect to the log of ODA of other donors, we find a significant and negative effect in most sectors (columns (2) and (3) of Table 3). This means that we find some coordination among donors taking place within countries. The calculation of marginal effects (not shown) reveals that the magnitude of the effect is significant. According to column (3), a 10 percent increase in ODA of other donors leads to a decrease in the likelihood that a donor engages in a certain sector by 0.20-0.66 percentage points, depending

¹¹ The significant and positive coefficient of *access to improved water sources* is rather counterintuitive. However, the variable is only significant at 10 per cent and loses its significance in column (3), where other control variables are included. There is also no sign of need orientation in this sector when we use *access to improved sanitation facilities* as an alternative need indicator.

on the sector.¹² The only sector where the variable turns out to be insignificant in both columns (2) and (3) is the government and civil society sector.¹³ By contrast, ODA of other donors turns out to be significant and positive in the estimation of emergency response, where herding among donors is perceived as beneficial (Frot & Santiso, 2011).

Estimations with the aid share as the dependent variable

In the second part of our empirical analysis, we examine whether the sectoral composition of donors' aid budgets in recipient countries is need-oriented. In doing so, we use the sector-specific aid shares as our dependent variable. Results from zero-one inflated beta regressions are presented in Table 4. In column (1), we only include the sector-specific need indicator and total ODA of the donor to the respective recipient country as explanatory variables. The results with respect to the sectors of environment protection, STD control including HIV/AIDS and emergency response are in line with the findings of the logit regressions and show evidence for a need-oriented allocation of resources within recipient countries. These results are also robust to the introduction of the sector-specific ODA of other donors in column (2) and other control variables in column (3) (GDP per capita, population and control of corruption).

In addition, the results show robust evidence for need orientation in the transport sector, where a higher percentage of paved roads leads to a lower share of aid going into this sector, although at the 10 per cent significance level only. According to column (3), need considerations also appear to be present in the governance sector, where donors allocate higher shares of their aid funds when corruption is high. However, the results with respect to the social infrastructure sectors are puzzling. Whereas the coefficients on the need indicators for the education and water and sanitation sectors turn out to be insignificant,¹⁴ the coefficient on under-five mortality is even counter-intuitive, as it turns out to be significant and negative in columns (1) and (2).¹⁵ These results are no doubt surprising. However, the analysis does not take into account the government expenditures in the different sectors. It may be the case that donors take government expenditures in these sectors into account when deciding on the share of aid going into them, which would imply a potential omitted variable bias in our estimations. However, when we include government expenditures in education and health in the respective estimations (not shown), the results on the need indicators remain qualitatively the same. Of course, one cannot rule out some form of reverse causality either, as the donors' share of aid going into a sector may in fact improve the situation in that sector. Indeed, the coefficient of under-five mortality loses its significance when we lag the variable for one period.

¹² The extreme values correspond to 7.2 and 20.4 per cent of the mean of the dependent variable, respectively.

¹³ This finding may not necessarily be negative as Ziaja (2014) finds positive effects of aid fragmentation in the field of democracy promotion.

¹⁴ An exception is column (3) in the case of the water and sanitation sector, where *access to improved water sources* turns out to be positive and significant at the 10 per cent level. The coefficient of the need indicator in the case of the education sector stays insignificant if we use primary completion rate, secondary school enrollment or secondary completion rate instead of primary school enrollment.

¹⁵ There is also no evidence of need orientation if we consider infant mortality or maternal health (percentage of births attended by skilled health staff) instead.

With respect to the question on donor coordination, the results clearly show that donors take other donors' aid activities in the different sectors into account when deciding on the sectoral composition of their country portfolios. With the exception of emergency response, all coefficients of ODA by other donors enter significantly negative throughout the specifications. Hence, donors allocate a lower share of their aid budgets to a sector where other donors are already heavily engaged.

4 Conclusion

In this paper, we focus on an important dimension of donors' aid allocation, which has largely been neglected in the empirical literature: the need orientation of donors' country portfolios. Employing sector-specific need indicators we are able to examine the need orientation of donors in various sectors. Logit and zero-one inflated beta estimations show that the degree of need orientation of donors depends on the sector. While in the sectors of governance, transport, environment protection, STD control including HIV/AIDS and emergency response, the analysis clearly points to a need-based allocation of resources, it is striking that need considerations seem not to play a role in the health and water and sanitation sectors. Our mixed results are in line with Thiele et al. (2007) who also find need considerations to matter in some but not in all sectors.

On the positive side, our results show that donors take other donors' aid activities into account when deciding on the sectoral composition of their country portfolios. This is an important finding as cross-country studies came to rather negative conclusions in terms of donor coordination (e.g. Davies & Klasen, 2013). In contrast, our findings suggest that donor coordination takes place within recipient countries.

In summary, we conclude that donors could improve their aid allocation by taking greater account of sector-specific need indicators within recipient countries. This is particularly the case in the social infrastructure sectors. Only when donors allocate their country budgets according to need, can aid be used in the best way to help achieve the SDGs of the 2030 Agenda.

References

- Alesina, A., & Dollar, D. (2000). Who gives foreign aid to whom and why? *Journal of Economic Growth*, 5(1), 33-63.
- Briggs, R. C. (2017). Does foreign aid target the poorest? International Organization, 71(1), 187-206.
- Briggs, R. C. (2018). Poor targeting: A gridded spatial analysis of the degree to which aid reaches the poor in Africa. *World Development*, *103*(2018), 133-148.
- Carter, P. (2014). Aid allocation rules. European Economic Review, 71, 132-51.
- Collier, P., & Dollar, D. (2002). Aid allocation and poverty reduction. *European Economic Review*, 46(8), 1475-1500.
- CRED (Centre for Research on the Epidemiology of Disasters). (2017). EM-DAT. The International Disaster Database. Retrieved from www.emdat.be/
- Davies, R. B., & Klasen, S. (2013). Of donor coordination, free-riding, darlings, and orphans: The dependence of bilateral aid on other bilateral giving (CESifo Working Paper Series No. 4177). Munich: Munich Society for the Promotion of Economic Research (CESifo).
- Dillinger, W. (2007). Poverty and regional development in Eastern Europe and Central Asia. (World Bank Working Paper No. 118). Washington, DC: World Bank.
- Dreher, A., Eichenauer, V., & Gehring, K. (2018). Geopolitics, aid and growth: The impact of UN Security Council membership on the effectiveness of aid. *World Bank Economic Review*, *32*(2), 268-286.
- Dreher, A., Klasen, S., Vreeland, J. R., & Werker, E. (2013). The costs of favoritism: Is politically-driven aid less effective? *Economic Development and Cultural Change*, 62(1), 157-91.
- Feyzioglu, T., Swaroop, V., & Zhu, M. (1998). A panel data analysis of the fungibility of foreign aid. World Bank Economic Review, 12(1), 29-58.
- Frot, E., & Santiso, J. (2011). Herding in aid allocation. Kyklos, 64(1), 54-74.
- Gehring, K., Michaelowa, K., Dreher, A., & Spörri, F. (2017). Aid fragmentation and effectiveness: What do we really know? *World Development*, *99*, 320-34.
- Kimura, H., Mori, Y., & Sawada, Y. (2012). Aid proliferation and economic growth: A cross-country analysis. *World Development*, 40(1), 1-10.
- Knack, S., & Rahman, A. (2007). Donor fragmentation and bureaucratic quality in aid recipients. *Journal of Development Economics*, 83(1), 176-97.
- Knack, S., & Smets, L. (2013). Aid tying and donor fragmentation. World Development, 44, 63-76.
- Negre, M., & Klingebiel, S. (2016). Assessing the costs and benefits of reducing fragmentation: Coordination in European aid. In S. Klingebiel, T. Mahn & M. Negre (Eds.), *The fragmentation of aid: Concepts, measurements, and implications for development cooperation* (pp. 277-94). Rethinking International Development Series. Basingstoke, UK: Palgrave Macmillan.
- Neumayer, E. (2003). *The pattern of giving aid: The impact of good governance on development assistance*. (Routledge Studies in Development Economics 34). London: Routledge.
- Nunnenkamp, P., Öhler, H., & Sosa Andres, M. (2017). Need, merit and politics in multilateral aid allocation: A district-level analysis of World Bank projects in India. *Review of Development Economics*, 21(1), 126-156.
- Nunnenkamp, P., Öhler, H., & Thiele, R. (2013). Donor coordination and specialization: Did the Paris Declaration make a difference? *Review of World Economics*, 149(3), 537-563.
- OECD (Organisation for Economic Co-operation and Development). (2017). *CRS Aid Activity database*. Retrieved from https://stats.oecd.org/Index.aspx?DataSetCode=CRS1/
- Öhler, H., Negre, M., Smets, L., Massari, R., & Bogetic, Z. (2017). Putting your money where your mouth is: Geographic targeting of World Bank projects to the bottom 40 percent. (World Bank Policy Research Working Paper No. 8247). Washington, DC: World Bank.

- Öhler, H., & Nunnenkamp, P. (2014). Needs-based targeting or favoritism? The regional allocation of multilateral aid within recipient countries. *Kyklos*, 67(3), 420-446.
- Ospina, R., & Ferrari, S. L. P. (2012). A general class of zero-or-one inflated beta regression models. *Computational Statistics & Data Analysis*, 56(6), 1609-1623.
- Pack, H., & Pack, J. R. (1993). Foreign aid and the question of fungibility. *Review of Economics and Statistics*, 75(2), 258-65.
- Thiele, R., Nunnenkamp, P., & Dreher, A. (2007). Do donors target aid in line with the millennium development goals? A sector perspective of aid allocation. *Review of World Economics*, 143(4), 596-630.
- Van de Sijpe, N. (2013). Is foreign aid fungible? Evidence from the education and health sectors. *World Bank Economic Review*, 27(2), 320-56.
- World Bank (2017). World Development Indicators. Retrieved from https://datacatalog.worldbank.org/ dataset/world-development-indicators/
- Ziaja, S. (2014). A nudge too far? The effects of democracy aid on democratization and political instability. (PhD thesis, University of Essex, Essex, United Kingdom).

Is the sectoral aid allocation within countries need-oriented?

Table 1: Distribution of ODA across sectors by all bi- and multilateral DAC-donors (%)						
Sectors	2000-2003	2004-2007	2008-2011	2012-2015		
Education	7.79	7.72	7.72	6.81		
Health	4.71	5.46	6.01	6.86		
Water & sanitation	4.40	4.73	4.75	4.78		
Governance & civil society	9.42	12.08	12.37	10.20		
Transport & storage	6.28	5.77	8.00	8.56		
Energy	4.09	4.63	5.81	8.30		
Agriculture, forestry and fishing	5.13	4.24	5.50	5.75		
General environmental protection	2.40	2.29	3.40	3.19		
STD control including HIV/AIDS	1.94	3.96	5.29	4.07		
Emergency response	6.08	6.20	6.63	7.28		
Source: Authors' calculations based on OECD-DAC CRS data						

Tables

Table 2: Distribution of ODA across sectors by the five largest bilateral donors and the two main multilateral donors (EU and IDA) in 2000-2015 (%)							
Sectors	EU	France	Germany	Japan	UK	USA	IDA
Education	4.99	17.21	14.17	4.95	7.80	3.15	10.52
Health	2.91	2.99	2.61	2.47	7.57	5.04	6.99
Water & sanitation	3.51	5.22	6.94	10.14	2.16	2.04	7.56
Governance & civil society	15.15	1.54	9.68	1.89	13.50	15.81	13.55
Transport & storage	9.09	6.97	2.49	24.59	1.95	2.69	11.82
Energy	5.67	4.80	10.96	12.63	2.02	3.56	10.74
Agriculture, forestry and fishing	5.16	4.23	3.75	5.33	2.99	3.97	10.04
General environmental protection	2.45	5.47	3.87	2.66	3.54	1.58	1.69
STD control including HIV/AIDS	0.16	0.16	0.63	0.05	2.91	12.41	1.01
Emergency response	8.77	1.72	3.08	2.25	8.58	14.62	0.29
Source: Authors' calculations based on OECD-DAC CRS data							

Table 3: Logit estimations for the 15 largest bilateral donors and the two main multilateral donors (EU and IDA)					
Sector/need indicator	(1)	(2)	(3)		
Education					
Primary school enrolment	-0.0208**	-0.0228**	-0.0193*		
• Ln ODA of other donors		-0.266**	-0.247**		
Health					
• Under-five mortality	-0.00201	-0.00334	-0.000518		
• Ln ODA of other donors		-0.0936	-0.134*		
Water & sanitation					
Access to improved water sources	0.0255*	0.0273*	0.0216		
• Ln ODA of other donors		-0.113**	-0.137***		
Government & civil society					
Control of corruption	-0.140	-0.138	-0.350		
• Ln ODA of other donors		-0.00484	-0.0577		
Transport & storage					
Paved roads	0.00667	0.00527	0.00642		
• Ln ODA of other donors		-0.336**	-0.336**		
Energy					
Electricity access	-0.00458	-0.00396	-0.00248		
• Ln ODA of other donors		-0.0703	-0.0950*		
Agriculture, forestry and fishing					
Agricultural land	0.00786	0.00651	0.00383		
• Ln ODA of other donors		-0.113	-0.156**		
General environmental protection					
• CO ₂ emissions	0.194	0.276	0.314		
• Ln ODA of other donors		-0.188***	-0.207***		
STD control including HIV/AIDS					
• HIV prevalence	0.122**	0.102*	0.148**		
• Ln ODA of other donors		-0.267***	-0.290***		
Emergency response					
• Ln disaster-related deaths	0.171**	0.165**	0.175**		
• Ln ODA of other donors		0.726***	0.681***		

Notes: Ln = natural logarithm.

Regressions are performed for each sector separately.

Column (1): need indicator and donor's total ODA to the respective country; column (2): (1) + Ln of ODA of other donors; column (3): (2) + GDP per capita, population and control of corruption.

Standard errors are clustered at the level of the recipient countries.

* p<0.1, ** p<0.05, *** p<0.01.

Source: Authors' estimations based on OECD-DAC CRS data

multilateral donors (EU and IDA)					
Sector/need indicator	(1)	(2)	(3)		
Education					
Primary school enrolment	0.00292	0.00235	0.000730		
• Ln ODA of other donors		-0.151***	-0.148***		
Health					
• Under-five mortality	-0.00285**	-0.00364***	-0.00190		
• Ln ODA of other donors		-0.0731***	-0.0779***		
Water & sanitation					
Access to improved water sources	0.0140*	0.00902	0.0137*		
• Ln ODA of other donors		-0.0399***	-0.0438***		
Government & civil society					
Control of corruption	-0.117	-0.0786	-0.0241		
• Ln ODA of other donors		-0.0650***	05953**		
Transport & storage					
Paved roads	-0.0106*	-0.0104*	-0.0108*		
• Ln ODA of other donors		-0.0930***	-0.0902***		
Energy					
Electricity access	-0.00468	-0.00426	-0.00417		
• Ln ODA of other donors		-0.0334***	-0.0401***		
Agriculture, forestry and fishing					
Agricultural land	0.0168	0.0150	0.00916		
• Ln ODA of other donors		-0.0923***	-0.0982***		
General environmental protection					
• CO ₂ emissions	0.180***	0.213***	0.196***		
• Ln ODA of other donors		-0.0802***	-0.0844***		
STD control including HIV/AIDS					
HIV prevalence	0.0691***	0.0581**	0.0683*		
• Ln ODA of other donors		-0.169***	-0.175***		
Emergency response					
Ln disaster-related deaths	0.137***	0.115***	0.107**		
• Ln ODA of other donors		0.203***	0.185***		

 Table 4: Zero-one inflated beta estimations with the 15 largest bilateral donors and the two main

Notes: Regressions are performed for each sector separately.

Column (1): need indicator and donor's total ODA to the respective country; column (2): (1) + Ln of ODA of other donors; column (3): (2) + GDP per capita, population and control of corruption.

Standard errors are clustered at the level of the recipient countries.

* p<0.1, ** p<0.05, *** p<0.01.

Source: Authors' estimations based on OECD-DAC CRS data

Appendix

r

Table A.1: Definition of variables and data sources								
Sector (OECD CRS)	Variable	Definition	Source					
	Dependent variables							
	Aid	Dummy variable equal to 1 if a recipient country received any amount of ODA in a specific sector by a specific donor	OECD (2017)					
	Aid share	Recipient- and sector-specific ODA share allocated by a specific donor Ranges between 0 and 1	OECD (2017)					
		ODA-related control variables						
	Donor's total ODA	The recipient-specific ODA by a donor	OECD (2017)					
	ODA of other donors	The sector-specific total ODA by other donors	OECD (2017)					
		Sector-specific need indicators						
I,1, Education, Total	Primary enrolment	Total number of students in the theoretical age group for primary education enrolled in that level, expressed as a percentage of the total population in that age group	World Bank (2017)					
I,2, Health, Total	Under-five mortality	Under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to age-specific mortality rates of the specified year.	World Bank (2017)					
I,4, Water Supply & Sanitation, Total	Access to improved water sources	Access to an improved water source refers to the percentage of the population using an improved drinking water source.	World Bank (2017)					
I,5, Government & Civil Society, Total	Control of corruption	Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	World Bank (2017)					
II,1, Transport & Storage, Total	Paved roads	Paved roads are those surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones, as a percentage of all the country's roads, measured in length.	World Bank (2017)					
II,3, Energy, Total	Electricity access	Access to electricity is the percentage of population with access to electricity. Electrification data are collected from industry, national surveys and international sources.	World Bank (2017)					
III,1, Agriculture, Forestry, Fishing, Total	Agricultur al land	Agricultural land refers to the share of land area that is arable, under permanent crops and under permanent pastures.	World Bank (2017)					
IV,1, General Environment Protection, Total	CO ₂ emissions	CO ₂ emissions are those stemming from the burning of fossil fuels and the manufacture of cement.	World Bank (2017)					
STD control including HIV/AIDS	HIV prevalence	Prevalence of HIV refers to the percentage of people aged 15-49 who are infected with HIV.	World Bank (2017)					

VIII,1, Emergency Response, Total	Ln disaster- related deaths	Logarithm of the total number of deaths through natural disasters	CRED (2017)
	·	Standard control variables	
	Ln population	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.	World Bank (2017)
	Ln GDP per capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 US dollars.	World Bank (2017)
	Control of corruption	Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	World Bank (2017)

Publications of the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE)

Studies

- 98 Duguma, Mesay K., Michael Brüntrup, & Daniel Tsegai. (2017). Policy options for improving drought resilience and its implication for food security: The cases of Ethiopia and Kenya (87 pp.). ISBN 978-3-96021-048-1.
- 97 Reeg, Caroline. (2017). Spatial development initiatives potentials, challenges and policy lesson: With a specific outlook for inclusive agrocorridors in Sub-Sahara Africa (176 pp.). ISBN 978-3-96021-048-1.

[Price: EUR 10.00; publications may be ordered from the DIE or through bookshops.]

Discussion Papers

- 16/2018 Groß, Lisa. Assessing the impact of governance programmes: GIZ support to citizen participation in local governance in Benin (59 pp.). ISBN 978-3-96021-072-6. DOI:10.23661/dp16.2018
- 15/2018 Bohnet, Michael, Stephan Klingebiel, & Paul Marschall. Die Struktur der deutschen öffentlichen Entwicklungszusammenarbeit: Hintergründe, Trends und Implikationen für das BMZ und andere Bundesressorts (84 pp.). ISBN 978-3-96021-071-9. DOI:10.23661/dp15.2018
- 14/2018 Högl, Maximilian. Enabling factors for cooperation in the climate negotiations a comparative analysis of Copenhagen 2009 and Paris 2015 (70 pp.). ISBN 978-3-96021-070-2. DOI: 10.23661/dp14.2018
- 13/2018 Hilbrich, Sören, & Jakob Schwab. *Towards a more accountable G20? Accountability mechanisms of the G20 and the new challenges posed to them by the 2030 Agenda* (39 pp.). ISBN 978-3-96021-069-6. DOI:10.23661/dp13.2018
- 12/2018 Fues, Thomas. Investing in the behavioural dimensions of transnational cooperation: a personal assessment of the Managing Global Governance (MGG) Programme (53 pp.). ISBN: 978-3-96021-068-9. DOI: 10.23661/dp12.2018
- 11/2018 Lütkenhorst, Wilfried. Creating wealth without labour? Emerging contours of a new techno-economic landscape (71 pp.). ISBN 978-3-96021-067-2. DOI:10.23661/dp11.2018.
- 10/2018 Dombrowsky, Ines, Ariunaa Lkhagvadorj, & Mirja Schoderer. *River basin management and fiscal decentralisation: Mutually supportive or counterproductive? A case study of Mongolia* (64 pp.). ISBN 978-3-96021-066-5. DOI: 10.23661/dp10.2018.
- 9/2018 Dick, Eva, & Benjamin Schraven. *Regional migration governance in Africa and beyond: a framework of analysis* (28 pp.). ISBN 978-3-96021-065-8. DOI:10.23661/dp9.2018
- 8/2018 Marschall, Paul. *Evidence-oriented approaches in development cooperation: Experiences, potential and key issues* (61 pp.). ISBN 978-3-96021-064-1. DOI:10.23661/dp8.2018.
- 7/2018 Baumann, Max-Otto. *Mission impossible? Country-level coordination in the UN development system* (41 pp.). ISBN 978-3-96021-063-4. DOI:10.23661/dp7.2018.

[Price: EUR 6.00; publications may be ordered from the DIE or through bookshops.]

For a complete list of DIE publications: www.die-gdi.de