Conflict and Aid Dependency – An Explorative Study Motivated by the Case of Palestine

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Confronted with external and internal conflict, aid dependency has become Palestine's lifeline. Yet, the interaction between aid and conflict is unclear from two perspectives. First, common aid dependency concepts ignore dynamic accumulation effects. We therefore develop a concept of aid dependency that takes them into account. Second, while aid is given under the assumption that both donors and recipients want to build peace, shirking for the purpose of generating income from aid cannot be ruled out. Motivated by Palestine's case, we then explore cumulative aid dependency as a function of cumulative conflict from a cross-sectional perspective. Our results suggest both a long and short term relationship between aid dependency and conflict. As for the latter, we find that aid dependency and conflict Granger-cause each other. We conclude that it cannot be ruled out that aid is less effective in reducing conflict than conflict is in securing income.

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JEL Codes: D74, E01, F51, F52, N45

1. Introduction

This paper has several objectives. First, it introduces a concept of cumulative aid dependency. Eventually, the concept of aid dependency, unlike many other national accounting metrics, has no universally accepted definition. Second, our concept of cumulative aid dependency can be used to answer the question of whether a country becomes more or less aid-dependent over time. This concept is motivated by and illustrated using the case of Palestine. Palestine is one of the few countries in the world that have negative gross domestic savings and positive gross capital formation rates. The difference between negative savings and positive gross capital formation rates is largely financed by aid flows, increasing the country's aid dependency. Third, we explore conflict as an explanatory factor of aid dependency, which is both a controversially discussed topic in general and a development issue of great relevance to Palestine in particular.

In order to contribute to this last objective, we apply our concept of cumulative aid dependency to all aid-receiving countries and calculate for all of them their cumulative aid dependency between 2004 and 2014. In our empirical analysis, this variable is then used as the dependent variable and run against indicators of conflict and control variables. Our findings suggest that conflict and aid dependency mutually enforce each other.

The remainder of this paper is organized as follows: In section two we briefly review the relevant literature. In section three we introduce our theoretical framework for estimating cumulative aid dependency. Section four applies our theoretical framework to the case of Palestine. Section five discusses our data and methodology. We present our empirical results and major conclusions in section six.

2. Literature Review

The literature on the relationship between aid and conflict is sparse. A search on "EconLit" for "Aid Dependency" (July 2, 2018) yields only 48 hits, 18 of which are classified as academic journal articles. All others are working papers, books, book chapters, and reports. As for journal articles, almost all articles (17 out of 18) focus on "international linkages to development" and "the role of international organizations." Adding the search term "Conflict" to "Aid Dependency" reduces the number of hits to one, classified as a report. While a similar search for "Aid Effectiveness" yields 499 hits, 230 of which are published in academic journals, the number of hits reduces to 24 when adding the search term "Conflict." Only 11 of these are classified as academic journal articles. Combining the search terms "Aid Dependency" and "Palestine" or "Aid Effectiveness" and "Palestine" yields zero results. The small amount of research on the relationship is surprising in light of the fact that many aid recipients have some form of conflict. Eventually, conflict and post-conflict situations are a major driver of international aid.

Despite the fact that the literature on the nexus of aid and conflict is scarce, one important strand can be highlighted. This strand is about the question of whether aid is a conflict reducer or driver. Collier and Hoeffler (2002) analyze the effect of economic policy and the receipt of foreign aid on the risk of civil war. They conclude that neither aid nor economic policy affect conflict directly. Yet, aid reduces conflict if combined with "good" economic policy that leads to economic growth (Collier & Hoeffler, 2002). For economic recovery to happen after conflict, aid combined with policy reforms has been found to be very effective (Collier et al., 2008). In line with the argument that aid is effective when combined with

domestic institutional changes, Savon et al. (2011) argue that especially aid for democratic reforms decreases the risk of conflict.

De Ree and Nillesen (2009) consider the impact of foreign aid flows on the continuation and the onset of civil conflict. The authors suggest that aid is effective in reducing ongoing armed conflict, but not a significant factor in preventing the onset of conflict. One explanation for aid reducing the continuation probability is that it can decisively affect the balance of military power in a way that makes a ceasefire more likely. Why aid is non-significant in explaining the onset probability is an unanswered question. A possible answer might be that the dynamics underlying the onset of conflict are more complex than the dynamics determining actual warfare. Thus, aid can address less complex dynamics more effectively.

Besides complementary domestic efforts, another important determinant of aid-effectiveness is the donor community's time commitment. Collier et al. (2008) note that for aid and policy reforms to have a lasting impact, a long term commitment by the donor community is necessary. This is particularly true for UN peacekeeping missions, which can significantly reduce the risk of renewed war.

The literature that finds that aid increases conflict emphasizes problems associated with the asymmetric distribution of aid in divided societies (Tahir, 2017). For example, when aid is given to a government that fights marginalized militarized insurgents, armed violence will likely increase (Crost et al., 2014; Dube & Naidu, 2015; Wood & Sullivan, 2015)

Aid withdrawal is another factor that can promote conflict (Nielsen et al, 2011). This, for example, could be the case when aid leads to the build-up of a donor economy. The presence

of aid organizations then creates allocative distortions in local economies. Such distortions are manifold. Donors, which are often concentrated in urban centers, drive up prices for local housing, which benefits landlords but harms renters. Aid organizations also demand goods and services that the economy will no longer produce once they leave. Besides housing, typical donor-economy goods and services are armored vehicles, catering, and recreational services.

The existing literature therefore suggests that when aid is inclusively allocated and complemented by conflict-reducing domestic institutional changes, aid can support positive peace. On the other hand, aid that prioritizes one group over the other, such as in Palestine, likely conserves societal divisions that may turn into conflict when aid is withdrawn. Nevertheless, asymmetric aid may help bring about negative peace if aid becomes a decisive element on the battle field.

Most of the literature on the relationship between aid dependency and conflict argues qualitatively. This literature, while insightful in many aspects related to country-specific conflict dynamics, often lacks conceptual clarity in terms of what constitutes aid dependency and conflict.

3. Aid Dependency Conceptualized

As opposed to other macroeconomic indicators, which are usually clearly defined, there is no generally accepted macroeconomic definition of aid dependency. Most aid dependency concepts are static concepts, meaning that they look at aid flows like overseas development assistance (ODA) or country programmable aid (CPA) relative to a macroeconomic indicator like GDP or gross capital formation. Yet, over time, aid dependency has cumulative effects,

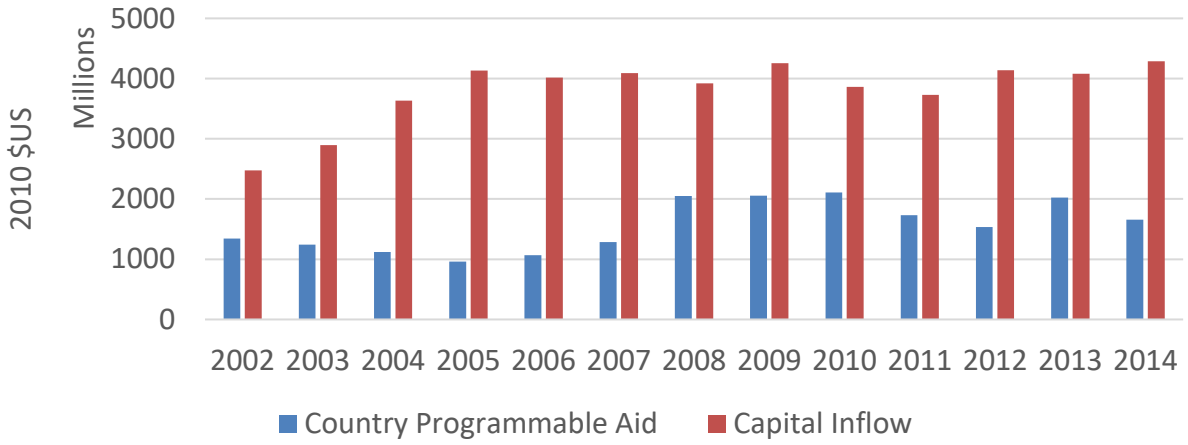
which are not captured by commonly used aid dependency indicators. We therefore want to propose a methodology that captures these cumulative effects over time.

Aid helps conflict countries with negative savings rates to generate positive capital formation rates. Countries in conflict are often trapped in a vicious cycle. Because of conflict, they are unable to finance themselves through capital markets, or only at prohibitively high interest rates; and because they do not have access to capital, they cannot build an economy that supports peace and economic development.

The difference between positive gross capital formation and negative gross domestic savings rate is equal to a country's capital imports. Such capital imports consist of foreign direct investment, remittances, and aid. In the case of Palestine, the total capital imports (% GDP) averaged 48.8% between 2002 and 2014. Country programmable aid received during the same period accounted for 41.2% of all capital imports.

We focus in this paper on country programmable aid rather than overseas development assistance because country programmable aid "tracks the proportion of ODA over which recipient countries have, or could have, significant say. As such, CPA is closer to capturing actual aid flows to countries than the concept of official development assistance, and has been proven a good proxy for aid recorded at the country level" (OECD, 2018). Figure 1 illustrates Palestine's total capital imports and country programmable aid received (in constant $2010).

Figure 1: Palestine's Inflows of Capital and Country Programmable Aid



Capital imports that are substantially financed by aid, such as in the case of Palestine, will lead to an increase in aid dependency. Figure 2 illustrates with the help of two different counterfactual and one actual capital stock trajectory our understanding of aid dependency. Essentially, we perceive aid dependency as the ratio of the difference between the actual and the counterfactual capital stock to the actual capital stock. We define the counterfactual capital stock as follows:

$$K_{cf_t} = K_{cf_{t-1}} + \frac{gds}{100} \times \left(Y_{t-1} - CPA_{t-1}\right) - \delta \times K_{cf_{t-1}} \; \forall t \in [2002, 2003, \ldots, 2014] \qquad (1)$$

where

gds = gross domestic savings (% GDP)

K = capital stock

Y = GDP

CPA = country programmable aid

δ = capital depreciation rate (% K)

cf = counterfactual

t = time

To hold the gross domestic savings rate constant under the assumption of the absence of aid is, of course, problematic. However, aid affects both saving and income, so that the gross domestic savings rate can be written as follows:

$$gds = \frac{S(Aid)}{Y(Aid)} \tag{2}$$

where

S = total savings

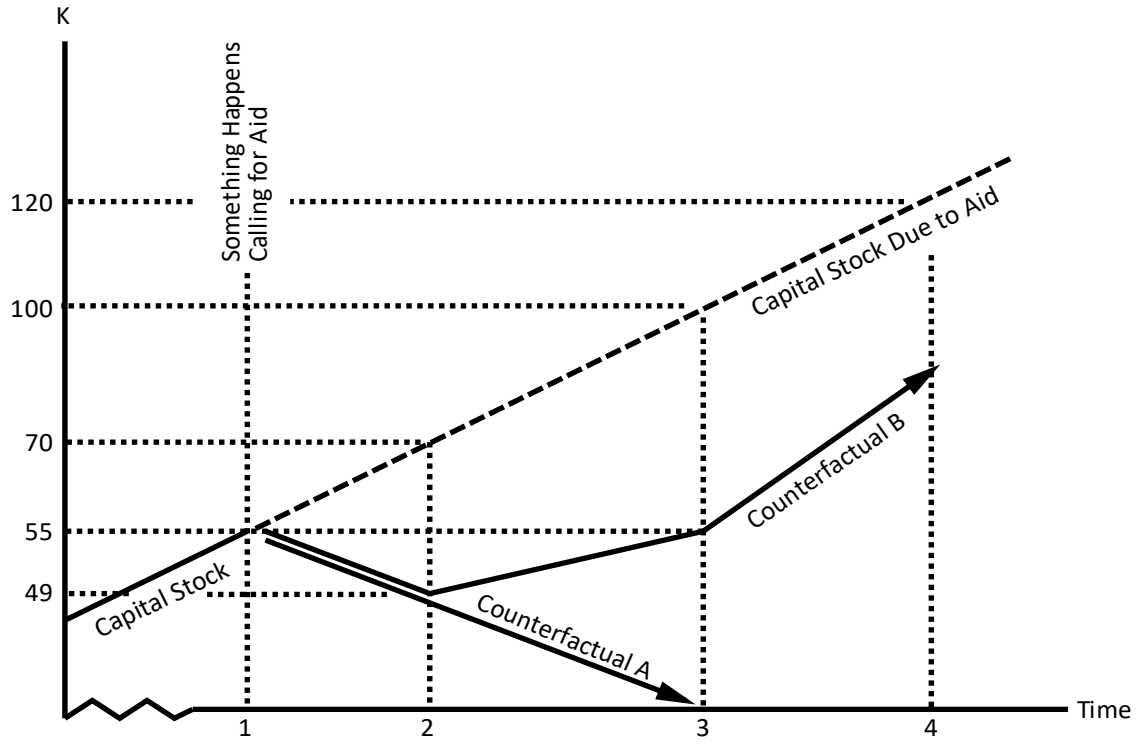
Aid, it can be assumed, then substitutes for domestic savings needs, which reduces domestic savings. On the other hand, aid increases income, which allows for more savings. The marginal net effect can therefore not easily be determined because

$$\frac{dgds}{dAid} = \underbrace{\frac{dgds}{dS}\frac{dS}{dAid}}_{<0} + \underbrace{\frac{dgds}{dY}\frac{dY}{dAid}}_{>0} = ? \tag{3}$$

Assuming that the gross domestic savings rate stays constant, at least for the short run, seems to be not unrealistic.

In Figure 2, the economy has zero aid dependency in period one. In period two, aid dependency increases to 30% ([70-49]/70]). The economy associated with trajectory A becomes even more aid dependent while the economy associated with trajectory B eventually outgrows aid dependency. In period three, economy A is 100% and economy B 45% aid dependent, but economy B increasingly closes the gap between the actual and counterfactual capital stock development.

Figure 2: The Concept of Aid Dependency



With the above in mind, we can formalize aid dependency as follows:

$$Aid\ Dependency = \begin{cases} \dfrac{K - K_{cf}}{K} \times 100 \ \ \forall K_{cf} > 0 \\ 100\ otherwise \end{cases} \tag{4}$$

4. Palestine's Aid Dependency

As for the literature on Palestine's aid dependency, Wilderman and Tartir (2014) argue that aid has neither led to development nor peace. They attribute this failure to the fact that "donors remain transfixed on a long failed 'Investment in Peace' framework that was designed for economic development by the World Bank back in 1993." Similarly, Taghdisi Rad (2015) argues that donors are captured by a narrow neoclassical world view that does not prevent effective aid, but fosters conflict. Ibrahim and Beaudet (2012) also do not find that aid has a meaningful effect on development and peace in Palestine. They argue that this

is due to the absence of Palestinian statehood and that aid has been "instrumentalized to stabilize the occupation."

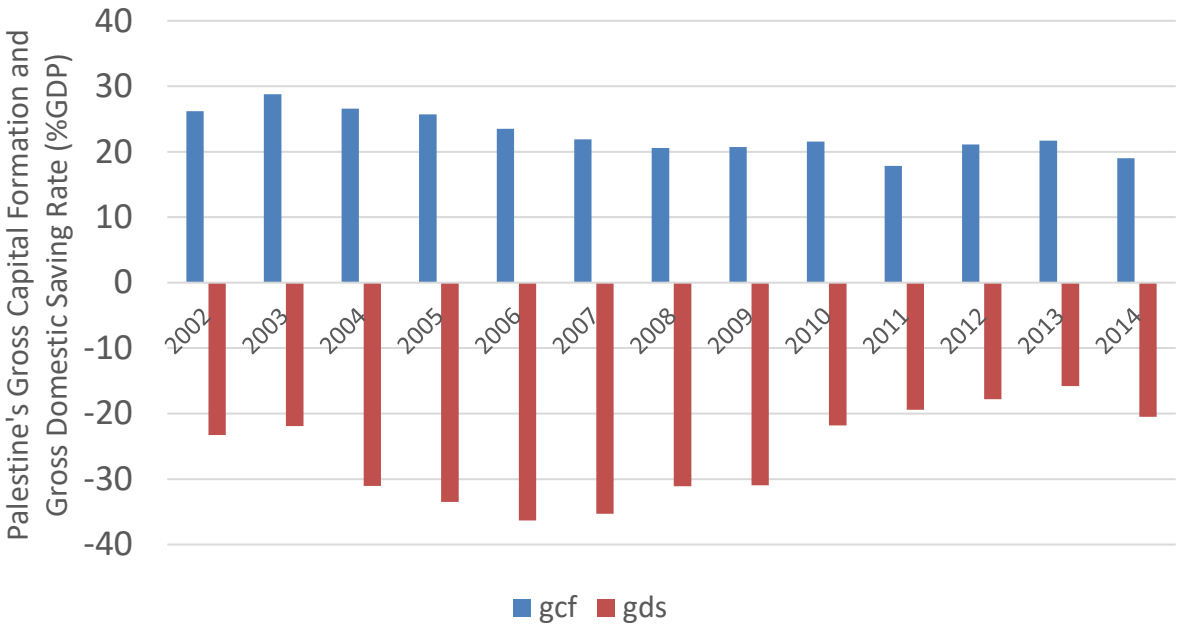
Despite a substantial amount of literature that blames donors for misguided aid policies, there is also a small amount of literature that finds that governance deficits of the Palestinian Authority contribute, at least partially, to lack of development and conflict. Turner (2006), for example, points at the high level of corruption as a source of Hamas' 2006 election victory, but also highlights that this is "merely a symptom, not the cause, of the crisis." The cause is not corruption per se, but the limited political and economic viability of the Palestinian State. Rubin (2006) also acknowledges the constraints imposed on Palestinian governance by the occupation, but argues that they should not be considered the cause of Palestine's "relative democratic failure." Instead, the author argues that political elite formation, lack of democratic values, outside intervention by a strong diaspora, and the exploitation of coercive means by the Palestinian Authority are to be blamed.

Palestine is captured in a vicious cycle of conflict, low domestic savings, and small autonomous economic development potential. Conflict undermines the incentives to save and the lack of savings prevents economic development, which in turn creates grievances that keep fueling conflict.

Ideally, aid is meant to help build a sustainable economic basis and reduce conflict through the creation of a peace prospect dividend. As far as the establishment of a sustainable autonomous economic base is concerned, however, Palestine is not on a track of self-sustainability.

This is illustrated in Figure 3, which shows that Palestine's average gross capital formation rate (%GDP) between 2002 and 2014 was 22.7% while its gross domestic savings rate (%GDP) was -26.0%. The difference between positive gross capital formation and negative gross domestic savings rates must be financed by capital imports, a substantial part of which is aid.

Figure 3: Palestine's GDS and GCF



As a result of aid, Palestine's capital stock has continuously increased since 2002. Without aid and assuming that negative savings rates would also prevail in the absence of aid, Palestine would have dismantled its capital stock, but because of aid inflows, the country's actual capital stock and aid dependency increased. These three dynamics are summarized in Figure 4. Figure 4 assumes that Palestine had zero percent aid dependency in 2002. Then, within the 12 years, between 2003 and 2014, Palestine accumulated an aid dependency level of 88.1%.

Figure 4: Palestine's Actual and Counterfactual Capital Stock

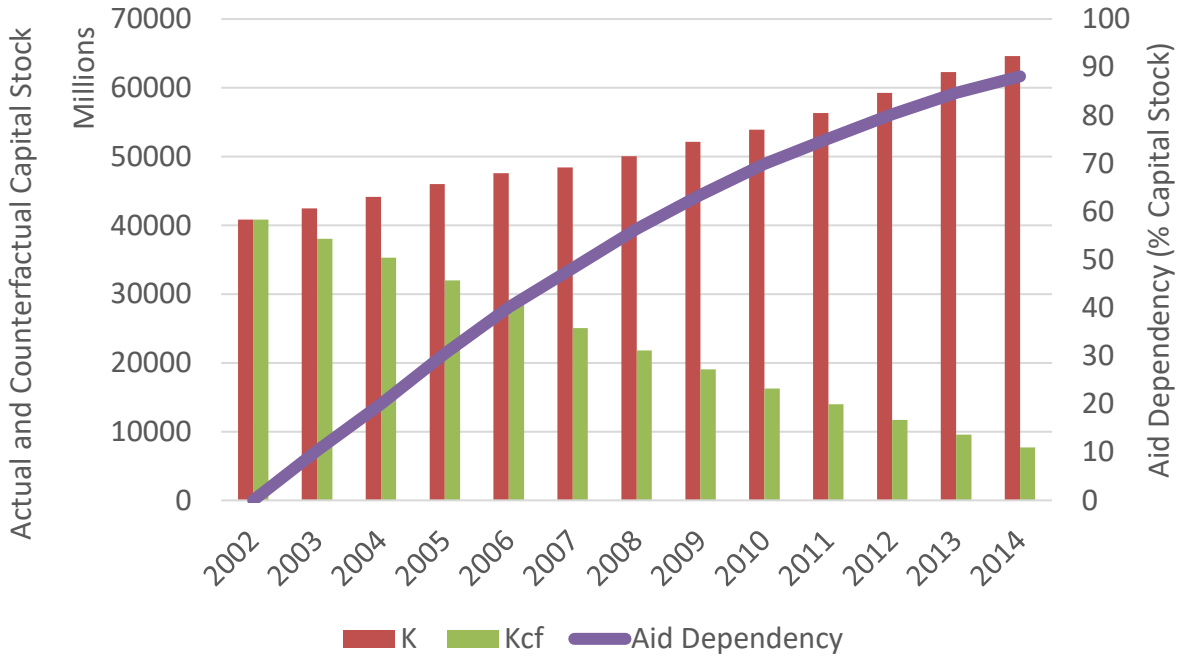


Table 1 shows the top-ten aid dependent countries, using our methodology, and the so called Weighted Conflict Index, which we cumulated over the 2002 to 2014 period. This index is available from the Cross National Time Series Archive. It takes into account conflict indicators such as assassinations, strikes, guerrilla warfare, government crises, purges, riots, revolutions, and anti-government demonstrations (Banks, 2016).

Table 1: Top-Ten Aid-Dependent Countries

Country	Aid Dependency (%)	Cumulative Weighted Conflict Index
Liberia	100.0	9248
West Bank and Gaza	88.1	3812
Bosnia and Herzegovina	82.8	563
Mozambique	80.8	1624
Comoros	79.3	0
Rwanda	74.3	7250
Lao PDR	73.6	0
Uganda	73.6	23623
Burundi	72.6	18437
Sierra Leone	71.8	4500

According to our calculation, Palestine accumulated the second highest aid dependency in the world between 2002 and 2014. Table 1, moreover, suggests that conflict is obviously an important correlate of aid dependency.

5. Does Conflict Explain Aid Dependency? – Data and Methodology

In order to explore the relationship between aid dependency and conflict in more detail, we built a panel data set. The units of observations, theoretically, are all the countries listed in the World Bank Development Indicators Database. The observations over time are the years 2002 to 2014. After eliminating countries for which no cumulative aid dependency or conflict score could be calculated, our final data set consists of 101 countries. Out of these 101 countries, only eight have a cumulative conflict score of zero.

Appendix Table 1 shows the countries included in each region. The variables used in our dataset are summarized in Table 2. Summary statistics for all our variables are shown in Appendix Table 2.

In our empirical models, the dependent variable is the cumulative aid dependency score in each year. Our main focus independent variable is the lagged cumulative aid dependency score to control for serial correlation, and the lagged cumulative conflict score. We also control for the multiplicative interaction between these two lagged variables in order to capture the expected mutually compounding effects between conflict and aid dependency.

Table 2: Data and Sources

Variable	Abbreviation	Source	Description	Transformation
Aid Dependency	AidDep	Calculated from OECD (2018), GGDC (2017), WDI (2016)	Accumulated aid dependency between 2003 and 2014, assuming zero aid dependency in the year 2002.	
Conflict	CumWCI	Cross National Time Series Archive	Cumulative Weighted Conflict Index between 2002 and 2014.	ln(CumWCI+1)
Armed conflict	CumAC	Center for Systemic Peace (2017)	Cumulative Armed Conflict Total Score between 2002 and 2014	ln(CumAC+1)
Interaction Term of AidDep and CumWCI	AidXCumWCI		Interaction term to control for multiplicative effects.	ln(AidDep*CumWCI+1)
Interaction Term of AidDep and CumAC	AidXCumAC		Interaction term to control for multiplicative effects.	ln(AidDep*CumAC+1)
GDP per capita	y	WDI (online)	GDP (constant 2010 US$).	ln(y)
Interaction Term of AidDep and lny	AidXlny		Interaction term to control for multiplicative effects.	ln(AidDep*y+1)
Polity 2 Score	Polity	Marshall et al (2016)	Index between -10 and +10 with negative scores indicating autocracies, scores between 1 and 6 describing anocracies, and scores of 7 and greater identifying democracies.	
Gini Coefficient	Gini	WDI (2016)	GINI index (World Bank estimate)	
Manufacturing and Services Export Share	MSExpShr	WDI (2016)	Calculated as a country's Manufacturing and Service Export Share as a percentage of GDP, using the variables Merchandise exports by the reporting economy (current US$), Manufactures exports (% of merchandise exports), Service exports (BoP, current US$), and GDP (current US$).	ln(MSExpShr)
Regional Dummies	EAP, EECA, LAC, MENA, SA, SSA, WE	Author's Definition WDI Classification except for WE and EECA	EAP= East Asia and the Pacific EECA= Eastern Europe and Central Asia (former socialist countries) LAC= Latin America and the Caribbean MENA= Middle East and North Africa SA= South Asia SSA= Sub-Saharan Africa WE= Western Europe	1, if country part of region, 0 otherwise

We also control for several other variables that might explain aid dependency. The first one is GDP per capita (lny), which captures the overall development level of a country. We expect an inverse relationship between GDP per capita and aid dependency. A second control is a country's level of democracy, which we capture by the Polity2 score. We hypothesize that more democratic practices reduce conflict, because democracy is already a conflict management mechanism that generates favorable socioeconomic outcomes that the international development assistance community is more likely to support. Our third control variable is the Gini coefficient of income inequality. More inequality, we hypothesize, increases conflict, undermines economic development, and therefore increases aid dependency. Fourthly, we also control for a country's manufacturing and services export share (%GDP). The greater this value, the more promising is a country's economic base, which should reduce a country's level of aid dependency. Table 3 summarizes our hypothesized relationships for our focus and control variables.

Table 3: Expected Relationships (DV=Aid Dependency)

Explanatory Variable	Hypothesized Sign
Aid Dependency (lagged)	+
Cumulative Conflict	+
Interaction of Aid Dependency and Cumulative Conflict	+
GDP per capita	-
Polity	-
Gini	+
Manufactures and services export shares	-
Regional dummies	?

In running our empirical models, we expect multicollinearity to be a problem, especially as regards to the interaction term of cumulative aid dependency and cumulative conflict and their respective individual components. Before defining all variables, we therefore examine a correlation matrix, shown in Table 4, with all explanatory variables.

Table 4: Correlation Matrix

	AidDep	lnCumWCI	AidXCumWCI	lny	Polity	Gini	lnMSExpShr
AidDep	1.00						
lnCumWCI	0.23	1.00					
AidXCumWCI	0.47	0.87	1.00				
lny	-0.25	-0.04	-0.11	1.00			
Polity	0.09	0.03	0.1	0.18	1.00		
Gini	-0.22	0.12	0.08	0.29	0.42	1.00	
lnMSExpShr	0.05	-0.15	-0.09	0.25	0.16	-0.06	1.00

A look at Table 4 confirms the expected high correlation between the interaction term of cumulative aid dependency and conflict.

In order to avoid typical multicollinearity problems such as non-significant or flipping coefficients, we orthogonalize the cumulative aid dependency and conflict variables by regressing each of the interaction term's subcomponents against the interaction term, storing the residuals, and using only these residuals as the explanatory variables. We label these variables by the suffix "res."

Because our dependent variable aid dependency is left censored with some countries having a cumulative aid dependency score of zero in the year 2003, we estimate our model using a Tobit model. We also use Tobit to orthogonalize cumulative aid dependency and conflict. Whenever a dependent variable is left-censored, either Tobit or Heckit needs to be employed. Heckit is considered to be more efficient whenever the estimate of whether or not an observation is non-zero and the magnitude of non-zero observations depends on different variables. This is not the case in our model. It can be plausibly assumed that cumulative conflict is both a determinant of whether a country becomes aid dependent and the level of aid dependency. However, because the problem of left-censorship is possibly not as severe, we also run a panel fixed effects model as one robustness check. We estimate our model

using the open source software "gretl" whose accompanying manual also provides a detailed description of the Tobit estimator.

All our models use the following estimation strategy. In model I, we only use our three focus variables "AidDepres(-1)," "lnCumWCIres(-1)," and the interaction term "AidXCumWCI(-1)" on the right hand side. We then successively add all control variables. The final model always includes all variables.

6. Empirical Results

The regression results are summarized in Tables 5 (Tobit) and 6 (panel fixed effects). The results show that the three focus variables "AidDepres(-1)," "lnCumWCIres(-1)", and "AidXCumWCI(-1)" always have the expected positive sign and are always significant at, at least, 5%.

As for the variable GDP per capita (lny), the results are puzzling. In the Tobit model, it always carries the expected negative sign and is significant at 1%. In the panel fixed effects model, it regularly carries the unexpected positive sign and is significant at, at least, 10%. Common explanations for unexpected signs are multicollinearity, omitted variable bias, and the combination of both (see, for example, Kennedy, 2002). The most likely explanation for the unexpected sign, we hypothesize, is the interaction of "AidDep" with "lny" (lnyXaid). For example, a given aid dependency level at a low income is likely to generate greater sense of dependency than at a high income level. Adding an interaction term to Model V of Table 6 as Model VI then indeed restores the hypothesized negative sign for lny. While the interaction term (lnyXaid) is positive and significant, but its absolute magnitude smaller than the

negative coefficient for "lny," the net effect of GDP per capita on aid dependency is, as hypothesized, negative.

Of course, this raises the question why the problem of an unexpected sign for "lny" does not occur in the Tobit model. We argue that the most likely explanation is that the Tobit model specifications have more degrees of freedom and therefore smaller standard errors than the panel fixed effects specifications. Possible multicollinearity problems therefore do not have as much leverage in the Tobit as in the panel fixed effects model.

In both estimation strategies, the variable Polity carries the expected positive sign and is also significant at, at least, 10% in all specifications, except Tobit Model VI and panel fixed effects specification IV. The variable income inequality (Gini) carries the predicted positive sign in the Tobit estimations, but is never significant. In the panel fixed effects estimations, the coefficient for Gini carries twice the unexpected negative sign and is also significant in Model IV. It though carries the expected positive sign in Model VI. An explanation for the flipping sign is likely the result of a much smaller sample size in combination with very little variation over time and therefore high correlation with the country fixed effects. More research regarding the impact of income inequality on aid dependency is necessary, but omitted here as the impact of income inequality on aid dependency is not the primary focus of this paper. Lastly, the economic structure variable manufactures and services export share, %GDP (lnMSExpShr) carries the expected negative sign in Model V and VI of the panel estimation. It is also significant at 1% in Panel Model V, but not significant in Panel model VI. It is also not significant in any Tobit specification and even carries the unexpected negative sign.

Table 5: Tobit Regression Results (DV=Aid Dependency, Focus IV: Weighted Conflict Index)

	Model I	Model II	Model III	Model IV	Model V	Model VI
const	16.73***	28.46***	29.59***	31.79***	29.45***	30.37***
	(0.22)	(0.85)	(0.86)	(1.70)	(1.53)	(2.43)
AidDepres_1	0.95***	0.93***	0.92***	0.94***	0.96***	0.96***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
lnCumWCIres_1	0.45**	0.48***	0.52***	0.47***	0.66***	0.63***
	(0.07)	(0.06)	(0.06)	(0.10)	(0.09)	(0.09)
AidXCumWCI_1	1.73**	1.70***	1.71***	1.66***	1.69***	1.67***
	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
lny		-1.51***	-1.69***	-1.91***	-1.69***	-1.83***
		(0.11)	(0.11)	(0.20)	(0.18)	(0.22)
Polity			0.07***	0.07*	0.07*	0.05
			(0.02)	(0.04)	(0.04)	(0.04)
Gini				0.01	0.00	0.02
				(0.02)	(0.02)	(0.03)
lnMSExpShr					0.14	0.14
					(0.14)	(0.17)
EECA						0.2
						(0.97)
EAP						-0.83
						(1.03)
MENA						0.13
						(1.16)
SA						0.15
						(1.18)
SSA						-0.82
						(1.11)
LAC						0.13
						(0.91)
n	1178	1178	1104	394	362	362
Log-Likelihood	-3234.79	-3141.89	-2895.02	-1014.22	-863.31	-860.72
Left-censored	49	49	47	14	13	13

Standard Errors in Parentheses; ***, **, *=significant at 1%, 5%, and 10% respectively

Table 6: Panel Fixed Effects (DV=Aid Dependency, Focus IV: Weighted Conflict Index)

	Model I	Model II	Model III	Model IV	Model V	Model VI
const	17.63***	0.47	3.81	-8.22	-40.94***	26.60***
	(0.23)	(7.02)	(7.10)	(15.73)	(12.51)	(8.31)
AidDepres_1	0.86***	0.84***	0.86***	0.88***	0.88***	0.35***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
lnCumWCIres_1	0.66***	0.64***	0.62***	0.47***	0.82***	0.44***
	(0.06)	(0.06)	(0.06)	(0.12)	(0.10)	(0.06)
AidXCumWCI_1	1.62***	1.59***	1.57***	1.30***	1.38***	0.57***
	(0.03)	(0.03)	(0.03)	(0.06)	(0.05)	(0.05)
lny		2.27**	1.82*	4.44**	7.93***	-3.03***
		(0.93)	(0.94)	(1.85)	(1.45)	(1.03)
Polity			0.1**	0.07	0.18**	0.17***
			(0.05)	(0.11)	(0.08)	(0.05)
lnyXaid						0.08***
						(0.00)
Gini				-0.18**	-0.07	0.07**
				(0.07)	(0.05)	(0.03)
lnMSExpShr					-0.74***	-0.15
					(0.25)	(0.16)
n	1178	1178	1104	394	362	362
Cross Units	101	101	95	89	79	79
R-squared	0.98	0.98	0.98	0.98	0.99	1.00
Time-series Min	2	2	4	1	1	1
Time-series Max	12	12	12	12	12	12

Standard Errors in Parentheses; ***, **, *=significant at 1%, 5%, and 10% respectively

In light of the previous discussion, Model VI of the panel specification is the most consistent with our theoretical understanding. We therefore use the coefficients of Model VI to estimate the effect of conflict on Palestine's aid dependency. More precisely, we are interested in the counterfactual aid dependency (cfAidDep) by cumulatively factoring out the effect of conflict beginning from year 2003. For this purpose, we program the following model:

$$\widehat{cfAidDep}_t = \begin{matrix} AidDep_{t=2003} - 0.44 \times lnCumWCIres_{t=2002} - 0.57 \times lnCumWCI_{t=2002} \; for \; t = 2003 \\ \widehat{cfAidDep}_{t-1} - 0.44 \times lnCumWCIres_{t-1} - 0.57 \times lnCumWCI_{t-1} \; for \; t \geq 2004 \end{matrix} \quad (5)$$

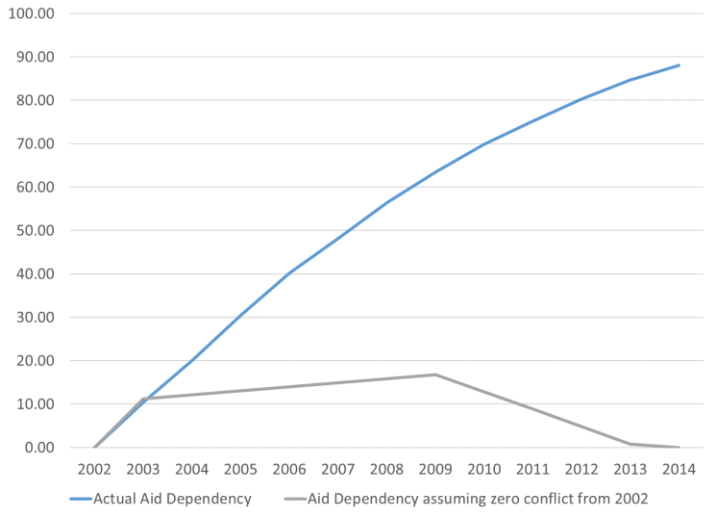
where

$\widehat{cfAid\ Dep}$ = the estimated counterfactual aid dependency, factoring out conflict

Figure 5 summarizes this estimate both in tabular and graphical form.

Figure 5: Palestine's Actual Aid Dependency and Counterfactual assuming Zero conflict from 2002

Time	Actual Aid Dependency	Aid Dependency assuming zero conflict from 2002	Graphical Illustration
2002	0.00	0.00	
2003	10.35	11.27	
2004	20.03	12.18	
2005	30.46	13.09	
2006	40.14	14.00	
2007	48.20	14.91	
2008	56.40	15.83	
2009	63.45	16.74	
2010	69.87	12.83	
2011	75.17	8.84	
2012	80.22	4.87	
2013	84.68	0.73	
2014	88.09	0.00	



The above simulation suggests that conflict is a major source of aid dependency for Palestine. Without conflict from 2002 on and holding everything else constant, it would take roughly

12 years for Palestine to outgrow its aid dependency. In reverse logic, conflict in the magnitude of the one that Palestine is exposed to will drive a country into a level of aid dependency that is approximately 88% in twelve years.

While our simulation and results indicate that conflict drives aid dependency, it is also plausible to hypothesize that aid is a source of conflict. This is because of the nature of a donor economy. The presence of massive aid channeled into the domestic capital stock often does not reflect the capital stock preferred by a country's citizens. An important question therefore is: Does aid drive conflict or conflict drive aid?

In order to answer this question, we also test a simple Granger causality model of the following kind:

$$d\_\ln CumConf_t = \beta_0 + \beta_1 \times d\_\ln CumConf_{t-1} + \beta_2 \times d\_AidDep_{t-1} + \beta_3 \times d\_AidXCumWCI_{t-1} \quad (6)$$

$$d\_AidDep_t = \chi_0 + \chi_1 \times d\_AidDep_{t-1} + \chi_2 \times d\_\ln CumConf_{t-1} + \chi_3 \times d\_AidXCumWCI_{t-1} \quad (7)$$

We estimate equations (6) and (7) using a panel fixed effects model. The results are summarized in Table 7. This Granger causality test suggests that, in the short-run, aid Granger causes conflict and conflict also Granger causes aid dependency. As for the change in cumulative conflict (d_lnCumWCI) as the dependent variable, the lagged change in aid dependency (d_AidDep) is positive and significant at 1% while the interaction term of aid dependency and cumulative conflict (d_AidXCumWCI) is not significant. Regarding the change in aid dependency as the dependent variable, only the lagged interaction term of aid dependency and cumulative conflict is positive and significant, and the magnitude of its

coefficient greater than the negative coefficient for the change in cumulative conflict (which is also statistically not different from zero).

Table 7: Granger Causality Test with Weighted Conflict Index

	DV=d_lnCumWCI$_t$	DV=d_AidDep$_t$
d_AidDep(-1)	0.053***	0.514***
	(0.016)	(0.022)
d_lnCumWCI(-1)	-0.064*	-0.062
	(0.038)	(0.053)
d_AidXCumWCI(-1)	0.007	0.077***
	(0.019)	(0.026)

In the above analysis, we used the Weighted Conflict Index as our conflict indicator. This indicator, however, focuses on societal tensions rather than armed conflict. For robustness check purposes, we therefore replicate the above analysis with an alternative conflict indicator, which is the Armed Conflict Total Score from the Major Episodes of Political Violence data set. This score is a measure of both international and national armed violence and war. Just as with the cumulative Weighted Conflict Index, we also cumulated the Armed Conflict score over time (lnCumAC). For methodological consistency purposes, we also orthogonalize, similar to the orthogonalization of the Weighted Conflict Index, lnCumAC and AidDep. Additionally, we also interacted again aid dependency and GDP per capita. Tables 8, 9, and 10 present the results from the Tobit, panel fixed effects, and Granger causality test (using again a panel fixed effects estimation), respectively.

Table 8: Tobit Regression Results (DV=Aid Dependency, Focus IV: Armed Conflict)

tobit	Model I	Model II	Model III	Model IV	Model V	Model VI
const	27.64***	39.56***	40.85***	44.58***	41.67***	40.06***
	(0.14)	(0.85)	(0.85)	(1.69)	(1.59)	(2.57)
AidDepres_1	0.91***	0.89***	0.88***	0.88***	0.89***	0.89***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
lnCumACres_1	0.73***	0.34	0.33	0.80	1.62***	1.80***
	(0.28)	(0.26)	(0.27)	(0.52)	(0.47)	(0.49)
AidXCumAC_1	1.81***	1.71***	1.77***	1.76***	1.75***	1.80***
	(0.05)	(0.05)	(0.05)	(0.08)	(0.07)	(0.08)
lny		-1.55***	-1.76***	-2.13***	-1.87***	-1.81***
		(0.11)	(0.11)	(0.20)	(0.19)	(0.24)
Polity			0.06***	0.04	0.02	0.01
			(0.02)	(0.04)	(0.04)	(0.04)
Gini				-0.01	-0.01	0.00
				(0.02)	(0.02)	(0.03)
lnMSExpShr					0.30**	0.38**
					(0.15)	(0.17)
EECA						1.04
						(1.07)
EAP						-0.28
						(1.10)
MENA						0.75
						(1.24)
SA						0.13
						(1.25)
SSA						0.76
						(1.18)
LAC						0.63
						(1.03)
n	1137	1137	1104	349	362	362
Log-Likelihood	-3111.16	-3018.25	-2889.30	-1018.62	-878.26	-876.46
Left-censored	49	49	47	14	13	13

Standard Errors in Parentheses; ***, **, *=significant at 1%, 5%, and 10% respectively

Table 9: Panel Fixed Effects Results (DV=Aid Dependency, Focus IV: Armed Conflict)

panel	Model I	Model II	Model III	Model IV	Model V	Model VI
const	27.78***	10.29	9.97	16.17	-12.25	49.01***
	(0.19)	(7.16)	(7.2)	(17.71)	(15.83)	(9.10)
AidDepres_1	0.82***	0.81***	0.81***	0.79***	0.78***	0.21***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
lnCumACres_1	0.86**	0.81**	0.59	0.32	2.35***	-0.71*
	(0.36)	(0.36)	(0.37)	(0.82)	(0.74)	(0.43)
AidXCumAC_1	1.73***	1.68***	1.64***	1.50***	1.86***	0.24**
	(0.11)	(0.12)	(0.12)	(0.20)	(0.18)	(0.12)
lny		2.3**	2.29**	2.51	5.54***	-5.84***
		(0.94)	(0.94)	(2.07)	(1.82)	(1.10)
Polity			0.13**	0.12	0.17	0.16***
			(0.05)	(0.12)	(0.11)	(0.06)
yXaid						0.10***
						(0.00)
Gini				-0.22***	-0.13*	0.06
				(0.08)	(0.07)	(0.04)
lnMSExpShr					-0.31	0.16
					(0.31)	(0.17)
n	1137	1137	1104	394	362	362
Cross Units	97	97	95	89	79	79
R-squared	0.98	0.98	0.98	0.98	0.98	1.00
Time-series Min	4	4	4	1	1	1
Time-series Max	12	12	12	12	12	12

Standard Errors in Parentheses; ***, **, *=significant at 1%, 5%, and 10% respectively

Table 10: Granger Causality Test with Armed Conflict Score

panel	DV=d_lnCumAC	DV=d_AidDep$_t$
d_AidDep(-1)	0.00	0.50***
	(0.00)	(0.02)
d_lnCumAC(-1)	0.21***	-0.47
	(0.04)	(0.54)
d_AidXCumAC(-1)	0.03***	0.42***
	(0.01)	(0.12)

When focusing on armed conflict on the right hand side, the results are generally weaker than is the case with the Weighted Conflict Index. In the Tobit and panel fixed effects estimation, our focus variable lnCumACres carries mostly the expected positive sign, but is not always significant. In Model VI of the panel fixed effects regression, lnCumACres even carries a negative sign and is significant. Armed conflict, as opposed to the Weighted Conflict Index, which is a more general conflict indicator than the armed conflict total score, has a much weaker long-term effect on aid dependency. As for the short-run, however, the Granger causality results also indicate mutually enforcing effects.

7. Further Discussion: Aid and Conflict from a Game Theoretical Perspective

There is no evidence from our analysis that aid is a significant factor in actually halting conflict. From an aid-optimistic perspective, the finding that countries with protracted conflict tend to increase their aid dependency suggests in reverse logic that aid, at best, tampers the unfolding of even more conflict. Aid pessimists, on the other hand, would argue that aid, on average, is simply ineffective to reduce conflict.

When looking at aid to countries with conflict, it is often implicitly assumed that both donors and aid-receiving countries have the common objective function to reduce conflict and to embark on a transition towards self-sustainable economic development. We argue that this assumption should not be taken for granted and that another interpretation of the result that

conflict increases aid dependency should be considered, which is that conflict can actually become a source of income.

The theoretical rational for this can be exemplified using the following two stylized non-cooperative games. In each game there are two players, recipient and donor. The recipient has two strategies, which are to build peace or to maintain conflict. The donor has two strategies, which are to give or withdraw aid.

The Nash equilibrium of the game that we call "Aid as a Source of Income" (Figure 6a) consists of the two strategies "maintain conflict" and "give aid." It is also a prisoner's dilemma and captures the idea of a donor economy. The Nash equilibrium of the game that we call "Aid as a Source of Conflict Resolution" consists the two strategies "build peace" and "withdraw aid," which is the social optimum and represents the idea of aid effectiveness.

Figure 6a: Aid as a Source of Income

		Donor: Give Aid	Donor: Withdraw Aid
Recipient: Build Peace		1,<u>4</u>	3,3
Recipient: Maintain Conflict		<u>2</u>,<u>2</u>	<u>4</u>,1

Figure 6b: Aid as a Source of Conflict Resolution

		Donor: Give Aid	Donor: Withdraw Aid
Recipient: Build Peace		<u>2</u>,2	<u>3</u>,<u>3</u>
Recipient: Maintain Conflict		1,1	2,<u>2</u>

Without any need for formalization of these two games, it is obvious that the Nash equilibrium is more likely a prisoners' dilemma if certain conditions apply. These conditions, holding everything else constant, are (1) the recipient has a low peace dividend, and (2) the donor has a high payoff from giving aid. Likewise, the social optimum is more likely when the peace dividend is high and the payoff from giving aid is low.

In the case of Palestine in general, we would argue that the occupation suggests a rather low peace dividend. Conflict countries that received aid with a high peace dividend, for example, were many of the breakaway republics of Yugoslavia, which saw an opportunity to join the European Union. As for the donors, the situation is more complicated. However, if one assumes that donors are not only guided by humanitarian objectives but also budget maximizing behavior in the sense of Niskanen (1968), then it seems plausible that donors prioritize recipients with complex conflict situations that attract a lot of media attention and provide for long-term donor commitments. In line of this, the interaction of conflict and aid as an income game seems, at least, theoretically conceivable.

8. Conclusions

The purpose of this paper is to introduce a concept of aid dependency. We argue that looking at aid dependency from a cumulative perspective provides a more accurate picture of its true magnitude than simple ratios of aid flows to some kind of macroeconomic indicator, such as aid as a percentage of gross capital formation or GDP.

When applying our method to all countries for which data is available and looking at the most aid dependent countries, it becomes obvious that the most aid dependent countries are often countries with a long legacy of protracted conflict. This then calls for an answer to the question of whether conflict is an explanatory factor of aid dependency. Our analysis suggests that this is the case. This is particularly true when the focus is directed on protracted conflict, which we argue is captured by the Weighted Conflict Index. When focusing on actual armed conflict, the relationship to aid dependency is not as strong. This seems to be a plausible conclusion because donors obviously find it much more difficult to

operate in environments where actual fighting takes place than in countries with negative peace.

The purpose of this paper is to show that conflict drives aid dependency and that this result allows for three possible explanations. This set includes aid effectiveness in the sense that aid prevents even more conflict, aid ineffectiveness in the sense that it does not affect conflict dynamics at all, and aid ineffectiveness in the sense that it actually fuels existing conflict. Which of these conclusions is most realistic requires further research as different conflict countries may be subject to different conflict dynamics. In conducting this kind of research, we hope that our analysis can contribute to the aid pessimistic literature and create awareness for the need of hypotheses beyond aid romanticism.

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Appendix

Table 1: Countries Included in Dataset (1 = Cumulative Conflict Score > 0, 0 otherwise)

EAP
Cambodia (1)
China (1)
Fiji (1)
Indonesia (1)
Lao PDR (0)
Malaysia (1)
Mongolia (1)
Philippines (1)
Thailand (1)
Vietnam (1)
EECA
Albania (1)
Armenia (1)
Azerbaijan (1)
Bosnia and Herzegovina (1)
Georgia (1)
Kazakhstan (1)
Kyrgyz Republic (1)
Moldova (1)
Tajikistan (1)
Turkmenistan (1)
Uzbekistan (1)
LAC
Argentina (1)
Belize (0)
Bolivia (1)
Brazil (1)
Chile (1)
Colombia (1)
Costa Rica (1)
Dominican Republic (1)
Ecuador (1)
El Salvador (1)
Guatemala (1)
Haiti (1)
Honduras (1)
Jamaica (1)
Mexico (1)
Nicaragua (1)
Panama (1)
Paraguay (1)
Peru (1)
St. Lucia (0)
Suriname (0)
Uruguay (1)
Venezuela, RB (1)
MENA (Conf Ctry)
Algeria (1)
Djibouti (1)
Egypt, Arab Rep. (1)
Iran, Islamic Rep. (1)
Iraq (1)
Jordan (1)
Lebanon (1)
Morocco (1)
Tunisia (1)
West Bank and Gaza (1)
Yemen, Rep. (1)
SA
Bangladesh (1)
Bhutan (1)
India (1)
Nepal (1)
Pakistan (1)
Sri Lanka (1)
SSA
Angola (1)
Benin (1)
Botswana (0)
Burkina Faso (1)
Burundi (1)
Cameroon (1)
Central African Republic (1)
Chad (1)
Congo, Dem. Rep. (1)
Congo, Rep. (1)
Cote d'Ivoire (1)
Equatorial Guinea (1)
Gabon (1)
Gambia, The (1)
Ghana (1)
Guinea (1)
Guinea-Bissau (1)
Kenya (1)
Liberia (1)
Madagascar (1)
Malawi (1)
Mali (1)
Mauritania (1)
Mauritius (0)
Mozambique (1)
Namibia (0)
Niger (1)
Nigeria (1)
Rwanda (1)
Senegal (1)
Seychelles (0)
Sierra Leone (1)
South Africa (1)
Sudan (1)
Swaziland (1)
Tanzania (1)
Togo (1)
Uganda (1)
Zimbabwe (1)
WE
Turkey (1)

Table 2: Summary Statistics

AidDep	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	28.77	25.96	22.29	26.96	35.39	28.41	15.40	26.88
Median	27.47	22.23	20.84	21.84	38.41	26.33	17.41	24.29
S.D.	19.52	22.61	16.12	21.30	19.24	21.65	8.41	20.37
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	73.57	82.84	69.02	88.09	65.98	100.00	24.74	100.00
lnCumWCI	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	5.98	5.83	6.57	6.40	9.08	5.76	7.99	6.26
Median	6.88	6.70	7.47	7.96	9.28	7.54	8.45	7.54
S.D.	3.81	3.17	3.28	3.91	1.47	3.87	1.89	3.63
Min	0.00	0.00	0.00	0.00	0.00	0.00	5.53	0.00
Max	11.01	10.05	11.21	12.99	12.07	12.34	10.74	12.99
ia	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	7.93	6.72	8.37	8.17	11.85	7.34	10.01	7.96
Median	10.00	9.06	10.36	10.34	12.79	10.05	11.34	10.32
S.D.	5.46	5.28	4.90	5.68	3.67	5.68	3.80	5.43
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max	14.91	13.88	14.85	16.23	15.94	15.90	13.94	16.23
lny	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	7.79	7.79	8.49	8.02	7.04	7.03	9.25	7.65
Median	7.84	7.95	8.58	8.12	6.95	6.69	9.27	7.76
S.D.	0.76	0.78	0.74	0.57	0.56	1.13	0.16	1.08
Min	6.16	6.19	6.50	6.99	6.14	5.39	8.99	5.39
Max	9.25	9.27	9.60	9.09	8.16	9.92	9.50	9.92
Polity	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	1.54	-0.23	7.48	-1.12	3.18	1.80	7.15	2.68
Median	3.00	-3.00	8.00	-2.00	5.00	2.50	7.00	5.00
S.D.	6.63	7.02	2.40	4.09	5.40	5.11	1.52	5.74
Min	-7.00	-9.00	-3.00	-9.00	-10.00	-9.00	3.00	-10.00
Max	10.00	9.00	10.00	7.00	9.00	10.00	9.00	10.00
Gini	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	38.64	31.88	49.84	35.72	35.88	43.93	40.30	42.69
Median	39.30	32.05	49.80	34.70	34.15	42.70	40.20	42.65
S.D.	3.85	4.91	4.41	4.73	4.93	8.15	1.35	8.80
Min	32.00	16.20	39.90	27.60	29.80	31.50	38.40	16.20
Max	46.30	40.10	59.50	45.10	46.80	64.80	42.60	64.80
lnMSExpShr	EAP	EECA	LAC	MENA	SA	SSA	WE	World
Mean	3.59	2.84	2.47	2.32	2.72	1.89	2.95	2.43
Median	3.66	2.98	2.47	3.07	2.73	2.14	2.95	2.65
S.D.	0.60	0.50	0.83	1.65	0.36	1.69	0.06	1.35
Min	1.83	1.47	-0.34	-2.65	1.60	-8.86	2.85	-8.86
Max	4.51	3.54	4.15	4.28	3.48	4.35	3.09	4.51