Aid Effectiveness and Allocation: Evidence from Malawi*

Kim Yi Dionne† Eric Kramon‡ Tyson Roberts§

April 17, 2013

Abstract

Our aim is to understand if and when aid is effective. This paper measures the impact of foreign aid, conditional on how and where it is spent. If aid has diminishing marginal returns, then aid should have the greatest impact when allocated to where it is needed most. Relatedly, when aid allocation is based on political favoritism, such aid may have less impact because need is not so high, or because the goal is merely to deliver aid projects to politically important constituencies rather than to achieve development goals. Our analysis has a two-stage approach that identifies first the determinants of aid allocation and then the impact of aid. We improve upon previous observational studies on the impact of foreign aid by focusing on how sector-specific aid projects affect outcomes in their respective sectors, rather than examining gross aid flows' effect on general outcomes like economic growth. Our analysis draws on multiple data sources from Malawi that measure need for development aid, geo-coded distribution of aid projects, and development outcomes.

*Paper prepared for the Conference on Foreign Aid at Princeton University, April 26-27, 2013. This is an initial draft; please do not cite or distribute.

†Authors' names appear in alphabetical order. Corresponding author: Assistant Professor, Political Science, Texas A&M University, 2010 Allen Building, College Station, TX 77843-4348. Email: kimyidionne@gmail.com.

‡Pre-doctoral Fellow, Center on Democracy, Development, and the Rule of Law, Stanford University.

§Faculty Fellow, Political Science, UCLA.

1 Introduction

The impact of foreign aid is ambiguous. There is no apparent simple relationship between aid and growth (Radelet, 2006), and scholars debating the impact of aid on growth have spilled a lot of ink (see Clemens et al. (2011) for a survey of the literature). As one scholar wrote about what works in development assistance, "...it is clear from the literature that *we do not know*" (Deaton, 2010, 425, emphasis added).

Our primary objective is to understand if and when aid is effective at achieving its objectives. We ask two questions: First, how is aid allocated? Second, what is the impact of aid? Because we expect allocation is driven by both need and politics, we designed this study to measure the impact of aid given the conditions of allocation. Consider two districts as candidates for a school-building project: the first district has a lower proportion of schools to population, but at the same time is a stronghold for the political opposition; the second district has a higher proportion of schools to population, and the president won a close majority in the most recent election. If the choice were based on need, the first district would receive the school-building project. If the choice were based on politics, the second district would receive the school-building project. Wherever it lands, what impact does the school-building project have on education-related outcomes? Which has a greater impact on outcomes: aid allocations based on need or aid allocations decided according to political calculus?

We develop a two-stage model that identifies in the first stage the determinants of aid allocation and in the second stage the impact of aid. Our analysis draws on multiple data sources from Malawi that measure need for development aid, geo-coded distribution of aid projects, and development outcomes. We analyze data from an African context because the success of aid in Africa in particular has been limited.[1] For example, a 2009 World Bank

[1] Easterly (2009) summarizes much of the aid failure literature for Africa.

study showed only 61 percent of projects in Africa had satisfactory outcomes, compared to 75 percent of projects worldwide between 1995 and 2008; health sector projects in Africa have performed particularly poorly, with only one-quarter achieving satisfactory results over the past decade, compared to 70% among low-income countries in other regions (Independent Evaluation Group, 2009, 15, 102).

The current iteration of the paper is a work in progress. Our empirical analysis thus far includes just two sectors of development: education (in particular, primary education) and health (specifically, infant survival). Our preliminary findings are that need and politics both play a role in the within-country allocation of education aid in Malawi. For health aid, on the other hand, our preliminary findings are that need is a significant determinant of allocation, and politics does not appear to play a role. For both types of aid, a broader measure of need (poverty rate) does not appear to play a role, but transaction costs do appear to play a significant role (urban areas receive more of both types of aid than do rural areas).

The paper proceeds as follows. In the following section, we summarize the relevant literature on aid effectiveness and aid allocation. In the third section, we describe a simple model that predicts the connection between aid allocation considerations and aid effectiveness. Among other hypotheses, the model predicts that aid allocated based on need will be more effective than aid allocated based on political affinity. In the fourth section, we provide some background information about Malawi, describe the data used in our analysis, and explain our empirical strategy to analyze the data. In the fifth section we present our preliminary empirical results, and in the sixth section we offer a brief discussion and conclusion.

2 Background

2.1 Aid Effectiveness

The primary goal of the paper is to understand if and when aid has a positive impact. Many studies on aid effectiveness find aid does not achieve its objectives. A meta-analysis of 68 studies finds that aid has a statistically insignificant (positive) effect on economic growth (Doucouliagos and Paldam, 2008).

The aid effectiveness literature suffers from a number of challenges. In this paper, we will highlight and seek to address three. First, many studies test aid effectiveness by measuring the total volume of aid and the correlation between this volume and a broad outcome such as economic growth. However, aid is not monolithic; different kinds of aid will have different impacts in terms of scope and timing. For example, Clemens et al. (2011) point out disaster relief aid may never have an impact on growth and aid for vaccination campaigns might only affect growth decades after the campaigns are over. These results suggest a need for considering types of aid when measuring impact.

Relatedly, much of the literature focuses in particular on aid's impact on economic growth. The findings on growth are equivocal but there is evidence that aid has had some success in areas other than economic growth. For example, health initiatives such as the Onchocerciasis Control Program and the campaign to eradicate guinea worm have had great success in improving targeted health outcomes (Levine, 'What Works' Working Group and Kinder, 2004). Randomized controlled trials (RCTs) have enabled a more direct test of the effectiveness of aid projects (e.g. Miguel and Kremer, 2004; Cohen and Dupas, 2010), but RCT detractors argue experiments can be too narrow and too local (Deaton, 2010), and thus are particularly challenged on external validity (Cartwright, 2010). Our study assesses the success of aid projects in their "natural habitat." We improve upon previous observational studies by focusing on how sector-specific projects affect outcomes in that sector, rather than examine

how gross aid flows affect a general outcome such as economic growth. For example, we look at aid for water projects and measure how effective this aid is in improving access to water.

Second, many studies assume that aid will have a linear effect on growth or other outcomes. However, studies that allow for diminishing returns have found that aid has a positive relationship with growth (Radelet, 2006). The first dollar per capita to arrive to a destitute region is likely to have a larger effect on infant mortality, for example, than the hundredth dollar per capita. To address this, we adopt a number of strategies, such as including aid and aid squared (as does Clemens et al. (2011)), and including the pre-existing level of each outcome as a control.

Third, most studies ignore the internal aid allocation process. Although a country may be in need of water projects at the national level, this does not necessarily mean that water projects will go to the subnational regions with the greatest need. Thus it is altogether possible that a country in need of water projects will receive a lot of aid for water projects, and that funding will be spent and we may not see an impact on national level outcomes related to water, even if measurable outputs (i.e. number of wells dug, number of chlorination tablets distributed, etc.) is high. Subnational allocation based on factors other than need may be one reason why previous studies have found aid having little impact. To address this, we consider the aid allocation process and (in later iterations of the paper will) control for this process in our analysis.

2.2 Aid Allocation

A secondary goal of the paper is to understand why aid goes where it does within a country. Though our focus is on subnational decisions about aid allocation, the published scholarship on international donors' aid allocation decisions provides relevant insights. Donors' motivations differ when allocating aid. Motivations can be humanitarian, political, or commercial. For example, Dollar and Levin (2006) find that some donors, such as the World Bank's IDA,

are particularly sensitive to recipient country need (as indicated by GDP per capita), but insensitive to institutional factors such as democracy, whereas for the United Kingdom, a country's level of democracy is a stronger predictor of aid flows than income level. Alesina and Dollar (2000) find that relations between countries (measured as similarity in UN voting records) is a significant predictor of aid flows from the major international players: the US, France, Britain, and Germany. Because this paper focuses on flows to one country, it controls for variables such as colonial relations and enables estimation of need-sensitivity.[2]

The aid politics literature largely examines cross-national aid flows, not subnational aid allocation. A recent exception is Jablonski (2011), who finds a consistent bias in aid distribution to electorally strategic constituencies in Kenya. Results vary by government in power, but generally there is evidence that more aid is allocated to constituencies that supported the president electorally or who are populated by co-ethnics, and constituencies with higher poverty rates actually receive less aid per capita. Jablonski's findings are consistent with a cross-national study that suggests in countries with poor political institutions, leaders will use foreign aid to fund favoritism, measured as nighttime light (Hodler and Raschky, 2010).

Like international donors selecting which countries to send foreign aid, national politicians may have multiple motivations influencing their decisions about aid allocation in the country. We expect need and politics to be the two primary factors driving aid allocation. A politician motivated by improving the conditions for the poorest of the poor would be more likely to allocate aid where there is the most need. A politician motivated by politics would be more likely to take into account electoral strategy or ethnic ties.

If aid has diminishing marginal returns (Radelet, 2006), then aid should have the greatest impact when allocated to where it is needed most. Relatedly, when aid allocation is based on political favoritism, such aid may have less impact because need is not so high, or because the goal is merely to deliver aid projects to politically important constituencies (Jablonski,

[2]Future analysis will include donor type as a predictor of allocation and impact.

2011), rather than to achieve development goals.

3 Modeling Aid Allocation and Impact

In this section, we present a simple model to explain our argument that aid motivated (at least in part) by need will have greater positive effect on developmental outcomes than aid motivated exclusively by factors other than need.

There are two actors, the aid-receiving government G and the foreign donor F.

The aid-receiving country has n regions. Each region i has some degree of affinity with the government, a and some level of developmental need, b. Aid, of quantity q, has some positive developmental benefit to the recipient areas, $U_i = d(q, b)$. This developmental benefit is greater if the area is needy, but has diminishing marginal returns with respect to the volume of aid; $d'(q) > 0$; $d''(q) < 0$. Therefore, if all n regions in the country have equal levels of need, equal allocation of aid to all regions would produce the greatest developmental benefit.

Aid-receiving governments are constrained in their allocation decisions by foreign donors. We assert foreign donors have a preference for aid to be allocated to areas with high levels of need.[3] The foreign donor enjoys some utility from sending aid, of quantity q, to needy areas $U_F = f(q, b)$, but pays some domestic political cost p for sending aid abroad. The domestic political cost of sending aid to areas with high levels of need is lower than the cost of sending aid to areas with low levels of need, i.e., $p'(b) < 0$. Furthermore, the utility from sending this aid has diminishing marginal returns, i.e., $f'(q) > 0$ and $f''(q) < 0$. The maximum amount of aid available to send to the recipient government is $\overline{Q}$. Because the donor pays a higher price for aid to less needy areas, the donor may send less than $\overline{Q}$ to the recipient government

[3]Though we recognize donors' motivations are not only humanitarian (Dollar and Levin, 2006), in the context studied here (Malawi), it would be a far stretch to assert donors' preferences are geo-strategic and rarely would donors' motivations be commercial.

if some of that aid is assigned, by the recipient government, to regions with relatively low levels of need.

The aid-receiving government enjoys utility from allocating funds, such as aid from the foreign donor, to the regions in his country. In addition to utility from sending funds to areas in need, the government also enjoys utility from sending aid to regions with whom he has a high level of affinity, $U_G = g(q, a, b)$. Aid, of which q is distributed to each region, has diminishing marginal returns with regard to both developmental and political returns; $g'(q) > 0$ and $g''(q) < 0$. The utility maximizing strategy of the government is therefore to send the highest level of aid to regions with both high need and high affinity, and then to distribute the remaining aid to regions with either high need or high affinity. If there are regions with high affinity but low need, and if the foreign donor pays a high cost for giving aid to less needy areas, then the recipient government will sacrifice some aid, in aggregate, in order to enjoy the utility of sending aid to regions with high affinity.

As a result of this sacrifice, the country will have a sub-optimal developmental outcome for two reasons. First, the total level of aid will be less than could have otherwise been the case. Second, the aid is not allocated to the areas where it could have the greatest impact. To the extent that foreign donors are not discriminating about need, the recipient country will suffer less in terms of the loss of aid, but will suffer more from the inefficient allocation of aid, because the recipient government will have greater freedom to allocate aid based on affinity rather than need.

A simple example of the model illustrates the logic. Assume an aid-receiving country with two regions. Each region can have a high or low level of affinity and developmental need: $a \in \{0, 1\}$; $b \in \{0, 1\}$. The foreign donor's utility of sending aid to the two regions in the recipient country is $U_F = \sqrt{q_1} + \sqrt{q_2}$. The political price for the donor of sending aid is $p = 2 - b$, where the price per unit of aid to a needy region is 1 and the price of aid to a non-needy region is 2. The budget constraint for the donor sending aid is $\overline{Q} = 2q_{d=0} + q_{d=1}$,

where $q_{d=0}$ is the quantity of aid sent to non-needy regions and $q_{d=1}$ is the quantity sent to needy regions. As a result, if aid is sent only to needy regions, total aid sent $Q = \overline{Q}$. If aid is sent in part to non-needy regions, the total aid sent falls, and if all aid is sent to non-needy regions, $Q = \frac{1}{2}\overline{Q}$. The decision about how aid Q is allocated is made by the recipient government, who incorporates the foreign donor's price of aid (which determines Q) into his decision of how to allocate aid.

The recipient government's utility is defined as $U_G = (a_1 + b_1) \ln q_1 + (a_2 + b_2) \ln q_2$, and the budget constraint, passed through from the donor, is $\overline{Q} = 2q_{b=0} + q_{b=1}$. If both regions are needy and have the same affinity (either 0 or 1), then the aid is divided evenly, i.e., $q_i* = \frac{\overline{Q}}{2}$. If both regions have affinity but neither is needy, then the aid is divided evenly but total aid is reduced because of the costs of sending such aid for the donor, i.e., $q_i* = \frac{\overline{Q}}{4}$. If one region is neither needy nor has affinity, it will receive no aid, and all aid will be sent to the other region. Thus, the aid received by region i depends both on that region's affinity and need (which increase that region's share of aid) and the affinity and need of the other region (which decreases region i's share of aid). More generally, with price defined as $p = 2 - b$, the government's optimal strategy is to send each region aid in the amount of $q_i* = \frac{\overline{Q}}{2-b} \frac{a_i+b_i}{a_1+b_1+a_2+b_2}$. The amount of aid allocated by region and for the entire recipient country are illustrated for different scenarios in Figure 1.

If the benefit of aid is dependent on the level of need and has positive diminishing marginal returns with respect to the volume of aid, an example of the developmental utility function of aid is $U_i = b\sqrt{q}$. Using this example, then the developmental benefit of aid by region is summarized in Figure 2. According to the model, aid has greater impact in regions with more need, and the diversion of aid from regions with high need to regions with affinity but low need has negative developmental effects.

The model generates a series of predictions, which we test as the following hypotheses:

H1 Regions with high need will receive more aid than regions with little need.

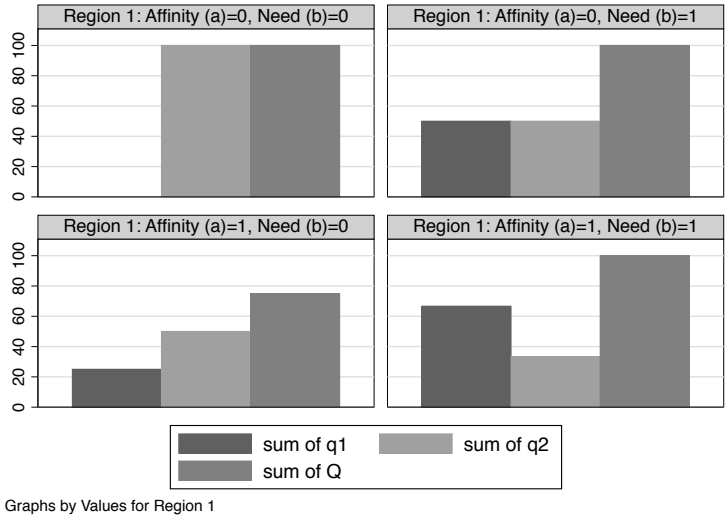


Figure 1: Allocation of aid by Region, if Region 2 has Need (b=1) but not Affinity (a=0)

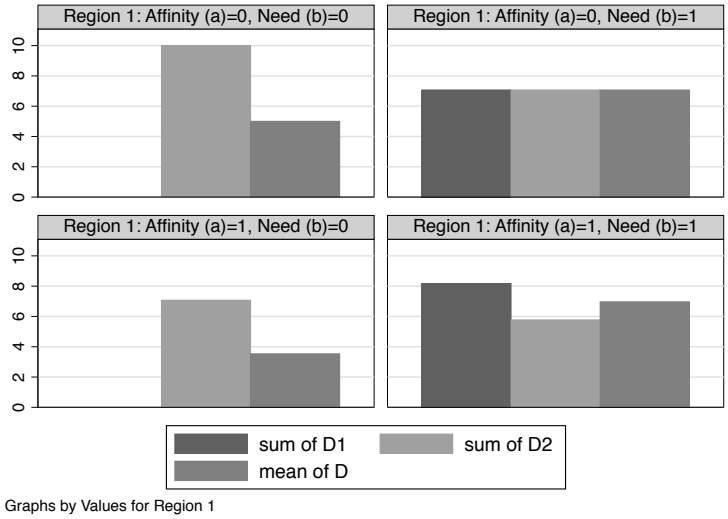


Figure 2: Developmental Improvements by Region, if Region 2 has Need (b=1) but not Affinity (a=0)

H2 Regions with high affinity to the government will receive more aid than regions with low affinity.

H3 Aid from donors who value need will be allocated to needy regions more intensively than aid from donors who do not value need.

H4 Regions with high need will benefit more from aid than regions without high need.

H5 Aid from donors who value need will have greater developmental impact than aid from donors who do not value need, particularly in countries where affinity plays a large part, relative to need, in the recipient government's decisions about aid allocation.

4 Methods

Within-country analysis enables us to control for various country-level factors that are often found to be significant predictors of aid flows, including colonial history, trade-relations, UN Security Council membership (Malawi has not yet been a member), and quality of governance by the national government, among others. We can thereby focus on the role of need and political affinity.

4.1 Setting

A landlocked country in south central Africa, Malawi has a population of 14.8 million, 90% of whom live on less than $2 a day (World Bank, 2012). Life expectancy at birth in Malawi was 53.4 years, less than that for sub-Saharan African countries on average (54.2 years) and low income countries across regions (58.8 years). Nearly half (47.8%) of Malawian children under five years of age are malnourished according to stunting data, which is high even when compared to other developing countries in sub-Saharan Africa (39.9%), and low

income countries around the world (39.4%).[4]

Political Context

Since 1993, Malawi has had a competitive multiparty system with a parliament and a directly elected president. Elections are held every five years, and Malawi employs a first-past-the-post electoral system. Freedom House has rated Malawi as "partly free" for most of the years between 1998 and 2012. According to quality of government measures by ICRG, the institutional quality in Malawi is typical for a low- or middle-income country. The presidency is very strong in Malawi and politics are highly personalized. At the local level, the constitution stipulates that ward councillors be elected to represent citizens in local assemblies, but Malawi has not had local government councillors since 2005 and local government elections have been postponed to 2014.

The political context of the period under study is split almost evenly by the May 2009 election. President Bingu wa Mutharika came to office in 2004, having been elected as a candidate for the United Democratic Front (UDF), the party of the previous president, Bakili Muluzi, who failed to have the constitution amended so that he could run for a third term. Mutharika won 36% of the popular vote and the UDF held a minority of seats in parliament (49 of 193). In 2005 however, Mutharika swiftly severed ties with Muluzi and the UDF, creating his own political party, the Democratic Progressive Party (DPP). The opposition-dominated parliament was hostile towards Mutharika during his first term. For example, the constitution requires parliament to debate and approve the budget. Because some MPs crossed the floor to the president's newly formed party, the opposition led a campaign to stall budget debate. In 2007, civil society and faith-based organizations staged a 14-day vigil at Parliament to persuade the opposition to pass the budget (Maganga, 2009). Following the eventual passage of the budget, and given the popularity conferred him for

[4]All comparative development indicators are 2010 estimates from World Bank (2013).

general economic success and a particularly successful fertilizer subsidy program, President Mutharika was re-elected to the presidency for his second term in 2009. He won two-thirds of the popular vote. The strong incumbency advantage in Africa and Malawi in particular makes his reelection unsurprising, but Mutharika and his party, the DPP, dominated their opponents. The 2009 election was the first in which a presidential candidate won a majority of votes in each of Malawi's three regions, and in the concurrent elections for parliament, the DPP won 113 out of 193 seats.

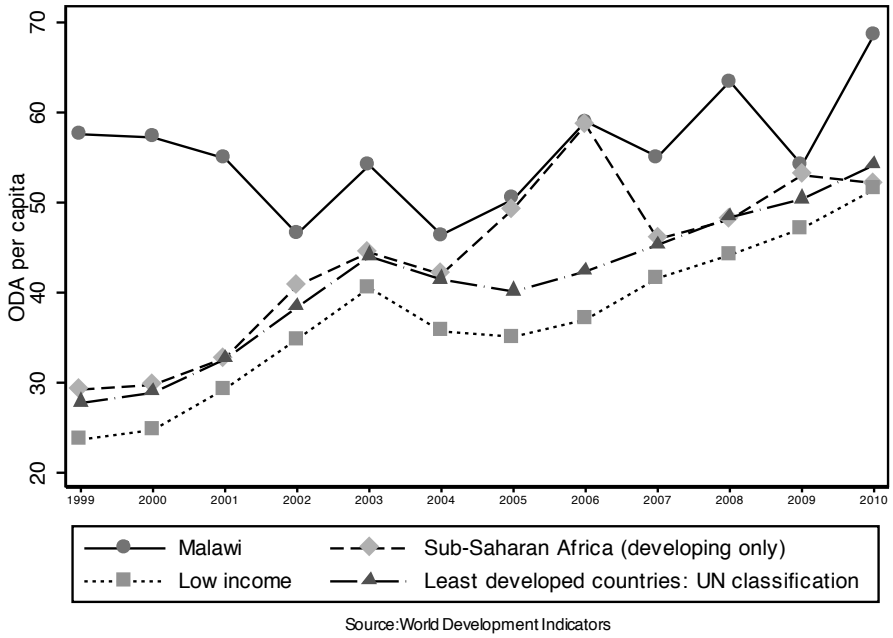
Following the 2009 election, Mutharika became heavy-handed in his governing, further centralizing power in the presidency by curtailing individual and press freedoms and interfering with the role of the judiciary (Dionne and Dulani, 2013; Cammack, 2012). In his second term, Mutharika also catered to his own Lomwe ethnic group, favoring them for government appointments and providing patronage to Lomwe traditional leaders and cultural organizations (VonDoepp, 2012; Africa Confidential, 2009). Critics of the president were harassed and victimized (VonDoepp, 2012; Dionne and Dulani, 2013). Mutharika's second term suffered from a declining economy as well (Cammack, 2012; Wroe, 2012). Mass protests calling for better democratic and economic governance took place in July 2011, during which 19 Malawians were killed and many more were injured. The political and economic context remained tenuous until Mutharika's sudden death in April 2012, after which his Vice President, Joyce Banda, was named president.

Foreign Aid in Malawi

Malawi is heavily dependent on foreign aid. There are aid-supported projects in all of Malawi's 28 districts, and these are funded by 31 different donors (Ministry of Finance [Malawi], 2011, 12). In 2009, 37% of the government's budget came from donor support (Ministry of Finance [Malawi], 2011, 19). Malawi receives more aid per capita than the average developing country in sub-Saharan Africa and other low income countries (see Figure

3).

Figure 3: Official Development Assistance Per Capita, 1999-2010



Malawian presidents have struggled with donor pressures. Fiscal indiscipline during the Muluzi (1994-2004) and Mutharika (2005-2012) presidencies prompted the International Monetary Fund (IMF) to suspend lending in 2001 and 2011, respectively (Resnick, 2012). Both IMF lending suspensions occurred during the presidents' respective second (and constitutionally final) term in office. As the government led by former President Bingu wa Mutharika began taking an authoritarian turn following his successful reelection in 2009, donors scaled back support, crippling local foreign currency reserves and making even more dramatic the economic decline Malawi was experiencing (Cammack, 2012; Dionne and Dulani, 2013; Wroe, 2012). Following violent government repression of popular protests in July 2011, multiple donors – including Malawi's three largest donors (DfID, EU, and USA) – suspended aid (Wroe, 2012).

Often, ordinary Malawians pressure their leaders against the demands of foreign donors.

The current president, Joyce Banda, has lost popularity among ordinary Malawians after her decision to devalue the currency (Jomo, 2013), an action necessary to the resumption of IMF lending. Malawians also spoke out after Banda's first State of the Nation address, in which she said she would repeal anti-homosexuality laws (Juma, 2012); though extending human rights to the LGBT community would be in line with donors' preferences that minority rights be protected, such a move would be counter to public opinion.

The main bilateral donors to Malawi include the US, UK, Germany, and Norway. USAID was the largest donor in 2010-2011, with $125 million in foreign aid disbursed overall (Ministry of Finance [Malawi], 2011). The primary multilateral donors to Malawi are the European Union, the Global Fund, the African Development Bank, and World Bank. New donors play an increasingly important role; in the 2010-2011 fiscal year, China committed $96 million of funds to Malawi and India disbursed $73 million (Ministry of Finance [Malawi], 2011).

Aid in Malawi is concentrated in a few sectors, primarily health, education, economic governance, roads and transportation, water and sanitation, and agriculture. The health sector received the lion's share of aid, accounting for 29% of total aid flows in 2010-2011 (Ministry of Finance [Malawi], 2011). Aid projects range widely, from supporting the national HIV/AIDS response to building classrooms for overcrowded urban schools. Different donors focus on different types of projects. For example, the African Development Bank's most common projects are in education and water; the World Bank primarily supports water, roads, and other public works; the EU primarily supports rural development, roads, and other public works; and the most common project sector for the US is health (Peratsakis et al., 2012).

4.2 Data

To examine the effect of aid on development outcomes, conditional on the allocation of aid, our analysis is done in two steps. In the allocation analysis, we examine why the Malawian government, in consultation with foreign donors, allocated aid to particular regions. In the impact analysis, we look at how this aid affected developmental outcomes.

Our analysis includes all of Malawi's 28 districts. Because some districts were recently formed (i.e. Neno formed after splitting from Mwanza District in 2003), some data is missing for these districts. Because of missingness, the analysis is often reduced to the 24 districts that pre-dated the multiparty transition, leaving out Balaka, Likoma, Neno, and Phalombe.[5]

We focus our analysis of aid allocations and developmental improvements on the period of 2004-2012, roughly divided between each of former president Mutharika's two terms. In some cases we will also include Muluzi's second term in office.[6] Mutharika's first term was 2004-2009, and his second term was 2009-2012 (he died in office April 5, 2012). We split the data in two periods: that preceding 2009 (2004-2008), and that from 2009 forward (2009-2012). In the first period, Mutharika's government is not only constrained in its decisions about aid allocation by foreign donors, but also by the pressures associated with reelection. Because Malawi's constitution limits presidents to two terms, Mutharika did not face an electoral constraint in the second period. Because the number of years in these terms differs, our dependent variables are measured as average aid per year (for the allocation model), and average annual improvement (for the impact model).

Data on foreign aid projects comes from the Malawi Geocoding project, a joint venture between AidData and the Robert S. Strauss Center's Climate Change and African Political Stability (CCAPS) program (Peratsakis et al., 2012). The Malawi Geocoding data is

[5]The districts are not entirely excluded, but instead are subsumed as parts of other districts (Machinga, Nkhata Bay, Mwanza, and Mulanje, respectively).

[6]There is some data available from Muluzi's second term in office, but with disproportionately less coverage of foreign aid projects, which is why we limit our scope to roughly cover the Mutharika presidency. See below.

based on aid information reported by donors to the Malawi Ministry of Finance. The AidData/CCAPS team reviewed and coded aid project documents gathered from in-country donor offices. The dataset includes geocoded data for 548 projects from 30 donor agencies representing $5.3 billion in commitments, which is approximately 80% of the total external assistance to Malawi reported to the government from 2000-2011. Because commitment data are more complete than disbursement data, we use commitment data, though we recognize the possibility that some committed data may not be disbursed as planned.

Many projects are allocated to multiple districts, but we do not have data on how much goes to each district because few aid agreements document subnational budgeting.[7] The Malawi Geocoding data assigns the same aid amount to each district in which the project is working: the total aid for the project.[8] When projects are in more than one district, we know each district will only receive a fraction of the committed aid. We assume more aid goes to districts with larger populations. We therefore divide the total aid amount by the aggregate population of the relevant districts to obtain aid per capita, which is the aid measure used for both the allocation and impact analysis. In addition, many projects are scheduled to be implemented for multiple years. For these projects, we divide the aid per capita by number of years, to obtain aid per capita per year.[9] For the allocation model, the aid per capita per year is assigned only to the period in which the agreement was made. For the impact analysis, we assign aid per capita to the relevant period's *aid per capita per year*, with the assumption that the aid is disbursed evenly across years.

Average levels of aid per capita per year, by period, for the allocation model is presented

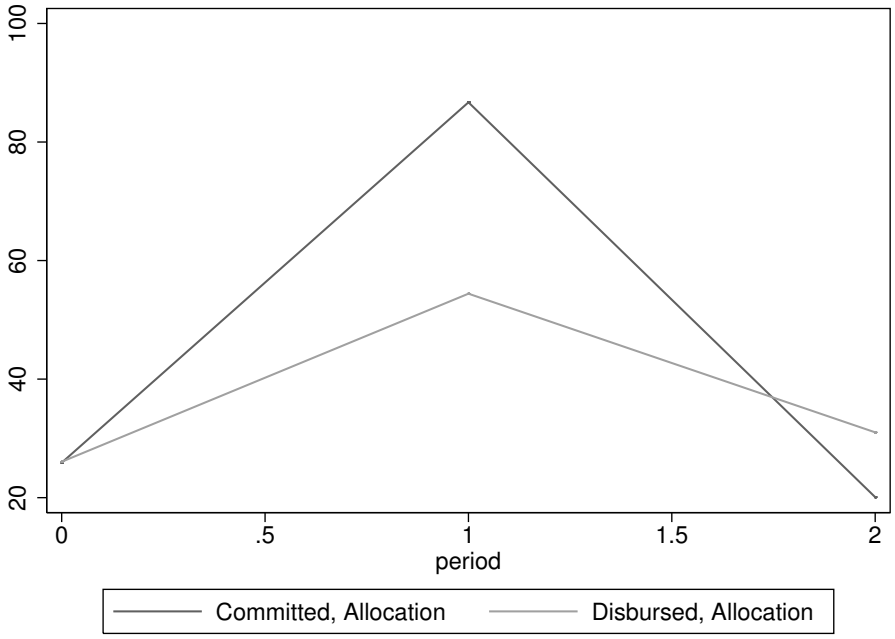
[7]There are also many projects that are not geo-located, often because the aid is for a national project (i.e., the German Agency for International Cooperation's grant to the Malawian government for Local Government Elections). National-level projects accounted for 6% of the committed aid in the dataset.

[8]For example, the German Agency for International Cooperation's grant for Democratic Decentralization from 2003-2007 totaled $8.9 million across 11 districts, and in the Malawi Geocoding dataset, all 11 districts have as "committed aid" $8.9 million.

[9]A small number of projects were lost because data were not available for either year of agreement or year of project completion.

in Figure 4. These data indicate that agreements made in Period 1 included much larger amounts of aid per capita per year than agreements made in Period 0 or Period 2. The disbursement data is approximately one-third lower in period 1, indicating either missing data or committed aid that was not disbursed. According to the data, disbursed aid is slightly higher than committed aid in period 2. As explained above, we use commitment data for this paper. Apart from data missingness concerns, commitment aid data seems more relevant for the allocation analysis, although less relevant for the outcome analysis. In future iterations of the paper we will consider disbursement aid data as well.

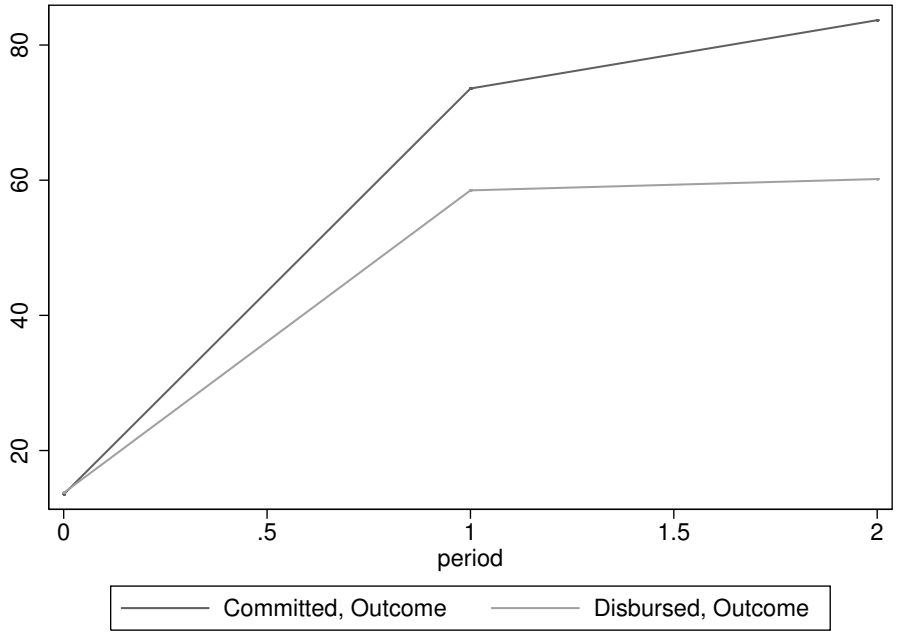
Figure 4: Aid per capita per year by period, for allocation model. Period 0: 1998-2003, Period 1: 2004-2008, Period 2: 2009-2012.



Average levels of aid per capita per year, by period, for the outcome model are presented in Figure 5. When compared to Figure 3, the aid per capita levels seem reasonable for periods 1 and 2, but there appears to be a great deal of missing aid from the Malawi Geocoding dataset for period 0. We therefore conduct our analysis with and without Period 0, and we

include period dummies.

Figure 5: Aid per capita by period, for outcome model. Period 0: 1998-2003, Period 1: 2004-2008, Period 2: 2009-2012.



In addition to looking at overall aid, we look at aid in two specific sectors: Education and Health. The Malawi Geocoding dataset includes purpose codes for the "purpose" of the aid and we use these to identify to which sectors projects belong. Health includes both the purpose codes "health" and "population and reproductive health." In future iterations of the paper, we intend to include analysis of two additional sectors: economic development and water and sanitation.

In both the allocation and the impact analysis, we include level of development in the year before the presidential term begins as an explanatory variable. In the allocation analysis, this indicates absence of need, and is expected to have a negative effect on aid allocation. In the impact analysis, previous year level of development is the lagged dependent variable. It is expected that aid has a greater impact where there is greater need, and so the lagged

dependent variable is expected to have a negative effect.

Level of development can be measured multiple ways for each aid sector. To measure the health of a district, we use infant survival.[10] Infant survival data come from the Malawi Demographic and Health Survey (MDHS).[11] For all measures drawing on DHS data, we aggregate individual responses to create district-level indicators.

To measure access to affordable education, we use primary school completion rates from the 2008 census and primary school enrollment rates from the 2010 MDHS. We expect the MDHS data to be more useful for the impact model in particular because the census measure includes the percentage of both children and adults who have completed primary school.

In addition to these sector-specific measures of need, we also use percent poverty at the district level to measure both need and impact. In higher income areas, local resources can be mobilized to address problems such as health, education, water access, and income opportunities. In low income areas, aid may play a more important role. District-level poverty data comes from the Malawi Integrated Household Survey (MIHS), conducted in 1997, 2004, and 2010.[12]

Our study asserts that aid is allocated according to two different motivations: to address need, and to serve political purposes such as rewarding past political support or favoring your co-ethnics. Using data from the Malawi Electoral Commission, we include in our analysis the presidential vote share, or the percent of the vote share the president received in the district in 1999 (for period 0), in 2004 (for period 1) and 2009 (for period 2). The president

[10] In future iterations of the paper we will also consider child survival, vaccinations, and prenatal care.

[11] The MDHS was implemented by the National Statistical Office (NSO) from June through November 2010. The 2010 MDHS selected representative samples in each of Malawi's 28 districts. We rely on data from the household interviews (N=24,825) and the interviews of women aged 15-49 (N=23,020).

[12] The purpose of the MIHS is to "better understand the target population of households affected by poverty" (National Statistical Office [Malawi], 2005, 1). The MIHS is a nationally representative sample survey that collects information on household welfare. The sample for MIHS-1 in 1998 was 10,698. MIHS-2 was conducted between March 2004 and April 2005 and included 11,280 households. The sample for MIHS-3, collected between March 2010 and March 2011, included 12,288 households. Likoma District was not included in the MIHS.

after the 1999 election was Muluzi; the president after the 2004 and 2009 elections was Mutharika. For periods 1 and 2, we also consider the change in vote for the winner relative to the previous election. Thus, change in vote share for period 1 indicates how much greater (or lower) Mutharika's support was in that district relative to the support for Muluzi in 1999; change in vote share in period 2 indicates how Mutharika's vote share increased (or decreased) relative to his own performance in 2004.

To measure the role of ethnicity in aid allocation, we draw on data from the 2008 census. We use ethnicity data to identify which ethnic group is the largest in each district and create a dummy variable for Lomwe, Tumbuka, Chewa, and Yao districts.[13] We also construct a binary variable equal to 1 if the majority ethnic group in a district is the same ethnic group as the president, 0 otherwise. This variable is only used when period 0 is included, since there is no change in the president's ethnic group between periods 1 and 2. Mutharika comes from the Lomwe ethnic group, and Muluzi comes from the Yao ethnic group.

As an additional control variable, we include a variable to measure the share of households in a district that are urban, according to the 1998 census.[14] We expect districts with a higher proportion of urban households to receive more aid per capita than districts with a lower proportion of urban households, since it is more difficult to deliver health and education services in rural areas. Other factors unrelated to need and political motivations could lower the transaction costs of delivering aid. For instance, proximity to Malawi's capital Lilongwe, where most international donors have offices, could make it more likely that a district would receive foreign aid because donors could have greater exposure to these areas. We calculate the distance from a district's capital to the capital city using travel time (in minutes) as

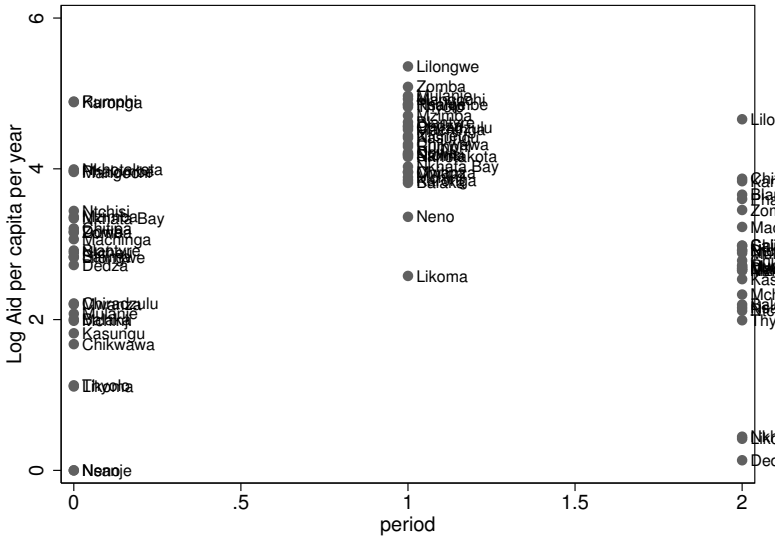
[13]No ethnic group in Malawi constitutes a majority. According to the 2008 census, these ethnic groups make up a significant proportion of the population: Chewa 32.6%, Lomwe 17.6%, Yao 13.5%, and Tumbuka 8.8%.

[14]The original data are the share of rural households. Most households are rural, so we subtract the share of rural households from one and take the log, in order to reduce skew.

estimated by Google Maps.[15]

To summarize, the unit of analysis is district-period, with period corresponding to presidential term. Aid is measured as aid per capita per year. For the allocation model, the entire aid project is assigned to the year of agreement; for the outcome model, aid is assigned to the relevant periods. Because aid is skewed, even if zero values are eliminated, we transform the aid per capita per year data, using $log(aid + 1)$, to ensure zero values are not lost. Explanatory variables with skewed distributions (urban regions, primary school enrollment, and primary school attendance) are also logged. Log aid by district and period are presented in Figure 6.

Figure 6: Aid per capita by district and period. Period 0: 1998 - 2003, Period 1: 2004-2008, Period 2: 2009-2012.



[15]We use the command `traveltime` in Stata.

4.3 Empirical Approach

Allocation analysis

For the allocation analysis, we follow the general strategy used by previous scholars (Nielsen, 2010; Canavire Bacarreza et al., 2005; Dollar and Levin, 2006). We begin by estimating the influence of need vs. political affinity, as well as other factors, for all donors collectively. The analysis is conducted separately for each project sector of aid: education and health. We use a Tobit model, which simultaneously estimates the effect of each explanatory variable on both whether or not aid is committed, and how much aid is committed.[16] We estimate an equation of the form:

$log(aid\ per\ capita\ per\ period_{i,j}) = b_0 + b_1(level\ of\ development) + b_2(poverty\ rate) + b_3(political\ affinity) + b_4(vector\ of\ other\ determinants)$

where i indexes aid sector and j indexes recipient district.

Districts with high need are expected to receive more aid. Districts with high political affinity to the national government (because of ethnic ties or a strong electoral result) will influence aid allocations if the national government has influence over where foreign aid is allocated and takes political factors into consideration. These are the key variables of interest for this analysis; the others are control variables.

Impact analysis

Based on the above analysis, we assign each donor-district-period to one of four groups. The first group will consist of donor-district-periods that are predicted to receive no or very little aid in that district, during that period, from that donor (because of low affinity and low need). The other three groups will be of approximately equal size, and are designated as the need-based group, the affinity-based group, and the need & affinity-based group.

[16] The Tobit model is not necessary for the analyzing all aid projects across sectors, since nearly all districts receive at least some aid, but is necessary for the sector-specific analysis, since many districts receive no aid for either education or health.

The need-based group includes those observations for whom the need-only model predicts the majority of predicted aid. The affinity-based group includes observations for whom the affinity-only model predicts the majority of predicted aid. The need & affinity-based group includes observations for whom both the need and affinity-only models predict relatively high levels of aid. These groups correspond with the four cells in Figures 1 and 2 from the formal model.

Within each group, we then estimate the impact of observed aid per capita per year on the developmental measures, controlling for the lagged level (from the year prior to the presidential term). We expect that aid will have little impact in regions with little need (those who are predicted to receive little or no aid, and the affinity-based group) and high impact in the regions with higher levels of need (the need-based group and the need & affinity-based group).

To estimate the effect of aid on development in the health and education sectors, we calculate a measure of change in each sector: we subtract the level of development (primary school attendance or infant mortality) in the previous period from the level of development in the current period. For primary attendance, this provides a measure of developmental improvement for periods 1 and 2; for infant mortality, we do not currently have data for period 2. If data permits, we will use the DHS to estimate these developmental measures for smaller time periods, so we can estimate change from the beginning of the period to the end of the period, instead of change from last period to the current period.[17]

Because of the very small number of observations, the current iteration of the paper uses a simple OLS regression (the distribution of change in development is normally distributed) with just three regressors: level of development in the previous period, log aid per capita in the current period, and log aid per capita squared. We expect level of development to have

[17]Doing so will allow us to measure the correct time periods, but at the sacrifice of precision since the estimate will be based on a smaller sample.

a negative effect, since districts with poor levels of development have more room to improve and improving from a low level is generally easier than improving from a high level. We expect aid to have a positive effect and the squared term to have a negative effect because we expect aid to have a positive and diminishing marginal effect on development.

In later iterations of the paper, we will use new estimates of development as described above, and plan to use a matching technique to estimate the effects of aid in high- versus low-need districts.

5 Results

5.1 Aid Allocation

The results on total aid allocation are presented in Table 1 (using census data for primary school completion rates) and Table 2 (using DHS data for primary school attendance rates). Considering need first, the results from Table 1 suggest that need plays little role in decisions for allocating aid. None of the coefficients for the need variables are significant in the expected direction, and Model 3 indicates that districts with higher levels of primary school completion receive more aid. Presidential vote share is also statistically insignificant. Model 2 indicates that more urban districts receive more aid, and that Lomwe districts tend to receive more education aid.[18] In Model 3, which includes Period 0 when Muluzi was president, ethnic match with the president is positive, as expected. In addition, Model 3 shows districts with large Yao populations receive more aid than otherwise similar districts.[19] Thus, the results from Table 1 suggest that for aggregated aid by district, an important determinant of aid allocation is ethnicity, in particular, ethnic match with the president.

Results from Table 2 use primary school attendance of school-aged children, which is

[18]President Mutharika is a member of the Lomwe ethnic group.
[19]President Muluzi comes from the Yao ethnic group.

Table 1: Determinants of Total Per Capita Aid Allocation (logged) In All Sectors

VARIABLES	(1)	(2)	(3)
Ethnic Match with President			0.815***
			(0.287)
Lomwe District		0.865*	-0.061
		(0.481)	(0.598)
Tumbuka District		-0.140	0.081
		(0.336)	(0.261)
Chewa District		0.286	0.400
		(0.352)	(0.339)
Yao District		0.377	0.666*
		(0.388)	(0.339)
Poverty Rate	0.004	0.008	0.014
	(0.005)	(0.011)	(0.009)
Log Urban	0.245	0.447**	0.163
	(0.157)	(0.214)	(0.161)
Log Primary School Completion (Census)	0.246	0.255	1.031**
	(0.274)	(0.464)	(0.506)
Infant Survival Rate	-5.538	-2.403	-1.481
	(6.597)	(7.477)	(8.727)
Presidential Vote Share	0.762	0.632	0.177
	(0.661)	(0.792)	(0.583)
Change in Presidential Vote Share	-0.648	-0.348	-0.485
	(0.423)	(0.638)	(0.650)
Period 1	1.561***	1.755***	1.617***
	(0.409)	(0.388)	(0.303)
Period 2			-0.214
			(0.433)
Constant	8.370	5.532	5.036
	(6.492)	(7.406)	(7.915)
Sigma	0.662***	0.625***	0.767***
	(0.105)	(0.091)	(0.082)
Observations	52	52	77
ll	-52.36	-49.30	-89.25

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Determinants of Total Per Capita Aid Allocation (logged) In All Sectors

VARIABLES	(1)	(2)	(3)
Ethnic Match with President			0.705**
			(0.276)
Lomwe District		0.889*	0.004
		(0.484)	(0.592)
Tumbuka District		-0.147	-0.150
		(0.411)	(0.346)
Chewa District		0.188	0.370
		(0.356)	(0.282)
Yao District		0.363	0.816**
		(0.444)	(0.404)
Poverty Rate	0.004	0.007	0.012
	(0.006)	(0.011)	(0.008)
Log Urban	0.294**	0.493**	0.285*
	(0.143)	(0.209)	(0.145)
Log Primary Attendance (DHS)	-0.062	-0.046	-0.439**
	(0.094)	(0.178)	(0.191)
Infant Survival Rate	-5.633	-2.217	0.874
	(6.180)	(6.911)	(7.472)
Presidential Vote Share	0.713	0.471	-0.074
	(0.656)	(0.815)	(0.553)
Change in Presidential Vote Share	-0.564	-0.212	-0.141
	(0.424)	(0.734)	(0.659)
Period 1	1.371***	1.601**	1.087***
	(0.458)	(0.661)	(0.324)
Period 2			0.491
			(0.527)
Constant	8.163	5.240	0.573
	(6.132)	(6.638)	(6.900)
Sigma	0.673***	0.634***	0.766***
	(0.107)	(0.095)	(0.085)
Observations	50	50	75
ll	-51.18	-48.18	-86.89

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

likely a better measure of need for education projects than is completion rates for all residents. With this measure in place, districts where fewer school-aged children attend primary school now appear to receive more aid, although this relationship is only statistically significant in Model 3. Degree of urbanization has a more consistent effect; in all three models, districts with more households in an urban area received more aid per capita, indicating that the convenience of low transaction costs is an important factor. Ethnic match with the president remains significant in Model 3, and the dummy variables for Lomwe district in Model 2 and Yao district in Model 3 remain significant. These results confirm that ethnicity, particularly ethnic match with the president, appears important for aid allocation, and reinforce that more urban districts receive more aid. Unlike the analysis using primary school completion rates for all adults to measure need, this analysis suggests that need for aid may also determine aid allocation, if need is measured by current primary school attendance.

Sector-Specific Aid Allocation

Scatter plots indicating the relationship between education sector aid per capita and primary school completion and attendance rates are shown in Figures 7 and 8, respectively.[20] These figures do not indicate an obvious relationship between education need and education aid. In fact, in Figure 8, the district with the highest level of education aid per capita, Phalombe, has a relatively low attendance rate, but the capital Lilongwe has the next highest levels of education aid despite rather high primary school attendance and completion rates.

We present the multivariate analysis for education aid allocation in Table 3 (using census completion rate data) and Table 4 (using DHS attendance rate data). Need appears to play a statistically significant role in education aid in Table 3 but not in Table 4. The coefficient for Ethnic Match with the President remain positive but is not statistically significant. Change

[20]The census measures use 1998 census data for Period 0 and 1 and 2008 data for Period 2. The DHS data use the average level of primary school attendance in the previous period for Periods 1 and 2, and in the current period for Period 0.)

Figure 7: Education aid per capita per year and primary school completion rates for all residents.

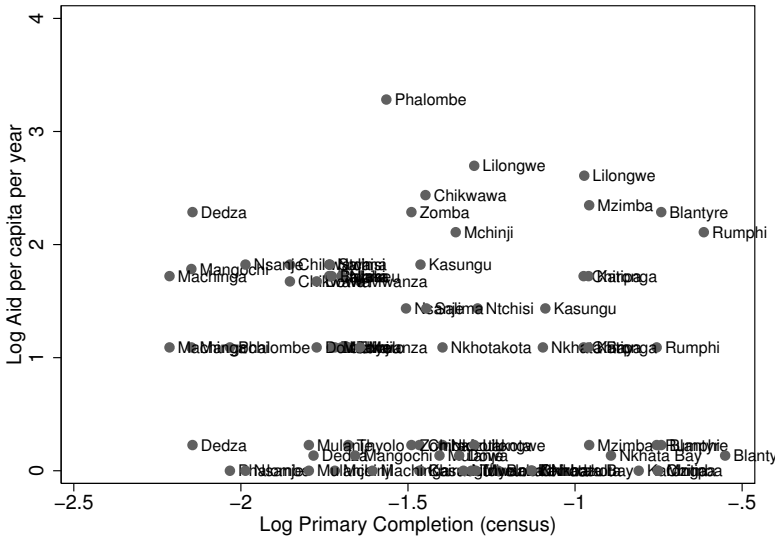
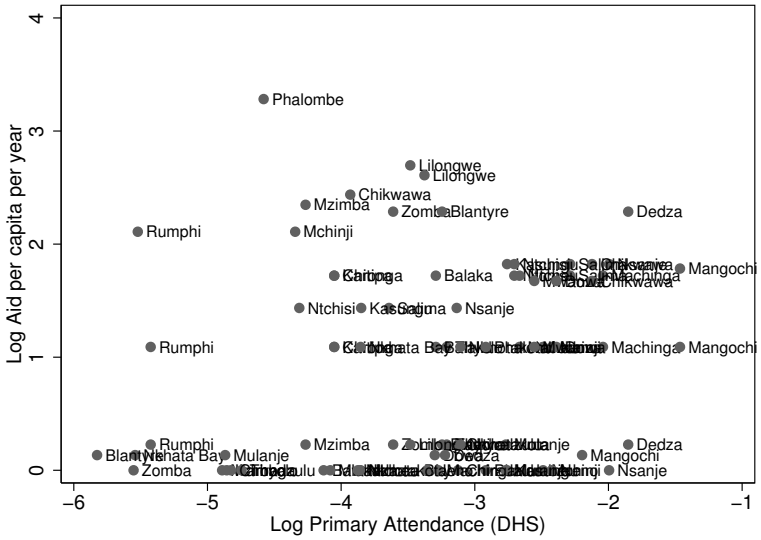


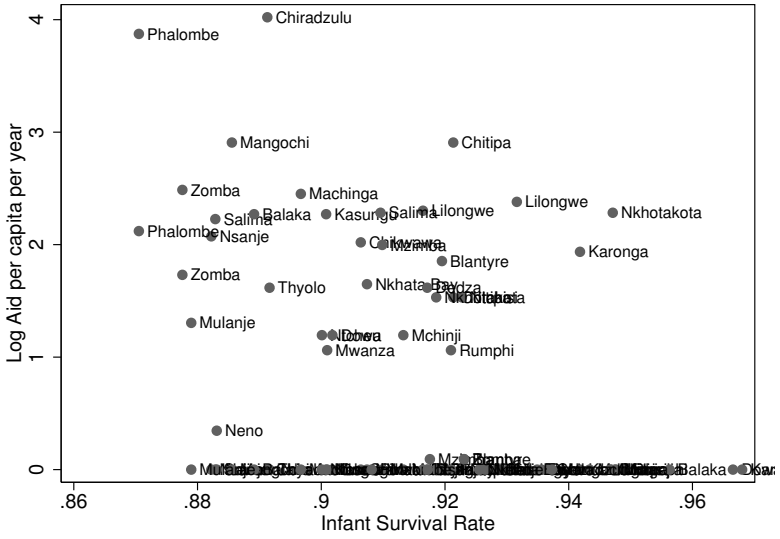
Figure 8: Education aid per capita per year and primary school attendance rates for school-age children.



in Presidential Vote Share, on the other hand, is statistically significant in all six models. Districts who increased their vote share for the president relative to the previous presidential election appear to be rewarded with education aid. The coefficient for urban households is consistently positive but only statistically significant in the first two models in Table 3.

Next we turn to health sector aid. A scatter plot indicating the relationship between health sector aid per capita and infant survival rate is shown in Figure 9.[21] The relationship between need and aid levels appears stronger than was the case for education; the top recipients of health aid, Phalombe and Chiradzulu, have low infant survival rates. However, aid per capita for the rest of the districts appear to have little if any relationship with infant survival rates.

Figure 9: Health aid per capita per year and infant survival rate.



We present the multivariate analysis for health aid allocation in Table 5. Need – measured as infant survival – appears to have a strong effect on aid allocation in all three models. Urban districts also receive more aid, according to all three models. None of the political variables,

[21] The infant survival measure is the previous period for Periods 1 and 2, and the current period for Period 0.)

Table 3: Determinants of Education Aid Per Capita Allocation (logged), using Census Primary Completion Data

VARIABLES	(1)	(2)	(3)
Ethnic Match with President			0.550
			(0.612)
Lomwe District		0.232	-0.672*
		(0.668)	(0.338)
Tumbuka District		0.563	0.183
		(0.555)	(0.365)
Chewa District		0.229	0.190
		(0.363)	(0.366)
Yao District		-0.482	-0.243
		(0.346)	(0.387)
Poverty Rate	-0.012	-0.006	-0.003
	(0.011)	(0.013)	(0.011)
Log Urban	0.430*	0.531***	0.236
	(0.231)	(0.194)	(0.142)
Log Primary Completion (census)	-1.487***	-1.637***	-0.830*
	(0.405)	(0.573)	(0.477)
Presidential Vote Share	-1.514**	-1.138	-0.250
	(0.578)	(0.825)	(0.666)
Change in Pres Vote Share	1.978***	1.564**	1.065*
	(0.561)	(0.772)	(0.604)
Period 1	0.851**	0.720**	0.732**
	(0.327)	(0.353)	(0.314)
Period 2			-0.302
			(0.386)
Constant	0.901	0.469	0.361
	(0.751)	(0.611)	(0.761)
Sigma	0.949***	0.926***	0.939***
	(0.137)	(0.134)	(0.085)
Observations	52	52	77
ll	-62.95	-62.16	-95.66

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Determinants of Education Aid Per Capita Aid Allocation (logged), using DHS Primary Attendance Data

VARIABLES	(1)	(2)	(3)
Ethnic Match with President			0.652
			(0.601)
Lomwe District		0.215	-0.721**
		(0.680)	(0.328)
Tumbuka District		0.402	0.175
		(0.585)	(0.457)
Chewa District		0.539	0.211
		(0.344)	(0.339)
Yao District		-0.406	-0.245
		(0.405)	(0.369)
Poverty Rate	-0.006	0.005	0.001
	(0.011)	(0.013)	(0.011)
Log Urban	0.202	0.317	0.130
	(0.243)	(0.209)	(0.144)
Log Primary Attendance (DHS)	0.367**	0.324	0.276
	(0.162)	(0.204)	(0.194)
Presidential Vote Share	-1.042*	-0.308	-0.080
	(0.540)	(0.666)	(0.551)
Change in Pres Vote Share	1.747***	1.165*	1.169*
	(0.562)	(0.654)	(0.591)
Period 1	0.891***	0.892***	0.807***
	(0.301)	(0.303)	(0.298)
Period 2			-0.207
			(0.396)
Constant	3.097**	2.127	1.827
	(1.389)	(1.321)	(1.311)
Sigma	0.967***	0.942***	0.930***
	(0.144)	(0.148)	(0.088)
Observations	51	51	76
ll	-63.72	-62.77	-94.46

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

however, have a statistically significant effect, and the (insignificant) estimates are generally in the wrong direction, relative to our predictions.

5.2 Aid's Impact

Now we turn to the impact of aid, measured as change in level of development from the previous to the current year, as a result of aid per capita per year (measured as both a linear and squared term) and controlling for "initial" level of development. **These results are preliminary.** Scatterplots comparing aid per capita and change in development are presented in Figures 10 and 11. There does not appear to be a clear relationship between more aid and improvements in development outcomes (measured as primary school attendance and infant survival).

Initial statistical analysis of the determinants of aid's impact (see Table 6) show the level of development in the previous period has a statistically significant negative effect, as predicted. Districts that start with a low level of school attendance or infant survival tend to experience greater levels of improvement. The coefficients for aid, however, are statistically insignificant, and the coefficient estimates are in the wrong direction for health aid.

To facilitate interpretation of the results, the predicted improvement in development outcomes is presented by beginning level and aid per capita in Figures 12 and 13. Each figure indicates that districts with high need (as measured by lower development levels in the previous period) experience greater improvement. The relationship between aid and improvement in education is in line with expectations (although with wide confidence intervals): more aid is associated with more improvement, but with diminishing marginal returns. The relationship between aid and improvement in infant survival, however, does not conform with expectations. The greatest improvement appears to occur in districts that receive little or no aid.

Table 5: Determinants of Health Aid Per Capita Allocation (logged)

VARIABLES	(1)	(2)	(3)
Ethnic Match with President			-1.718
			(1.452)
Lomwe District		0.513	1.700
		(0.521)	(1.413)
Tumbuka District		0.036	-0.376
		(0.361)	(0.588)
Chewa District		0.759***	0.213
		(0.279)	(0.515)
Yao District		0.441	0.083
		(0.285)	(0.461)
Poverty Rate	-0.013	-0.003	0.005
	(0.011)	(0.011)	(0.013)
Log Urban	0.326*	0.491***	0.459**
	(0.184)	(0.178)	(0.187)
Infant Survival Rate	-24.651***	-21.950***	-34.275***
	(9.026)	(6.834)	(10.951)
Presidential Vote Share	-0.401	0.133	-0.886
	(0.795)	(0.738)	(1.554)
Change in Pres Vote Share	-0.606	-0.529	-0.270
	(0.518)	(0.719)	(1.098)
Period 1	1.274*	1.507**	3.059***
	(0.640)	(0.567)	(0.530)
Period 2			1.740**
			(0.793)
Constant	24.594***	21.288***	31.073***
	(8.719)	(6.567)	(10.027)
Sigma	0.855***	0.799***	1.250***
	(0.131)	(0.131)	(0.185)
Observations	52	52	77
ll	-47.19	-44.95	-71.88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 10: Improvement in education attendance and education aid per capita per year

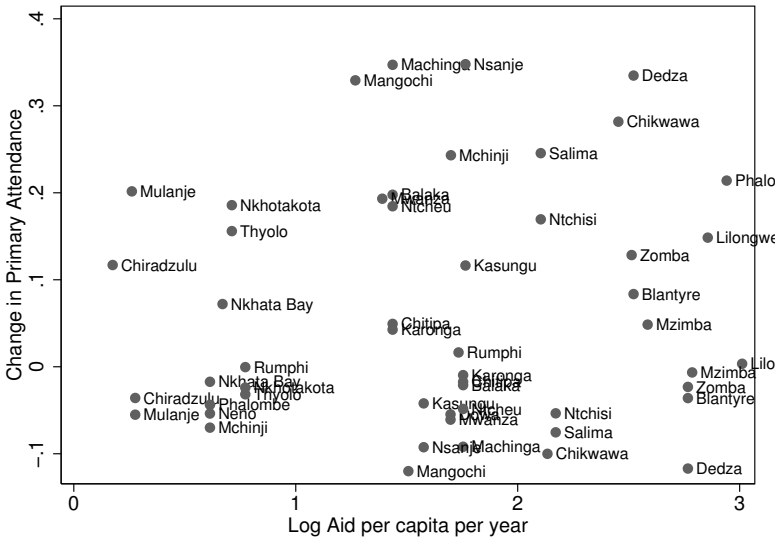


Figure 11: Improvement in infant survival and health aid per capita per year

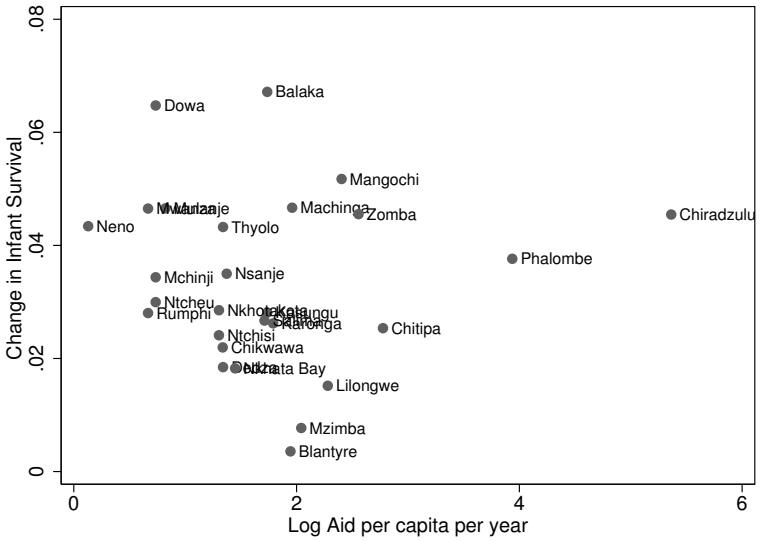


Table 6: Determinants of Improvements in Education Attendance and Infant Survival

VARIABLES	(1)	(2)
Log Primary Attendance (MDHS)	-0.052***	
	(0.016)	
Log Aid per capita per year	0.102	
	(0.061)	
Log Aid per capita per year squared	-0.028	
	(0.020)	
Constant	-0.199***	
	(0.071)	
Infant Survival Rate		-0.491***
		(0.140)
Log Aid per capita per year		-0.011
		(0.007)
Log Aid per capita per year squared		0.002
		(0.001)
Constant		0.488***
		(0.126)
Observations	51	27
R-squared	0.176	0.382
ll	34.64	81.10

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 12: Predicted improvement in Primary Attendance, by aid level and need.

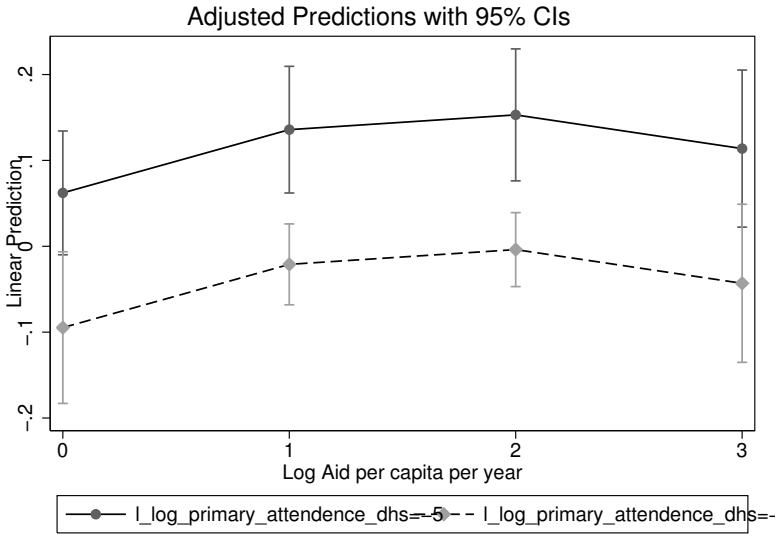
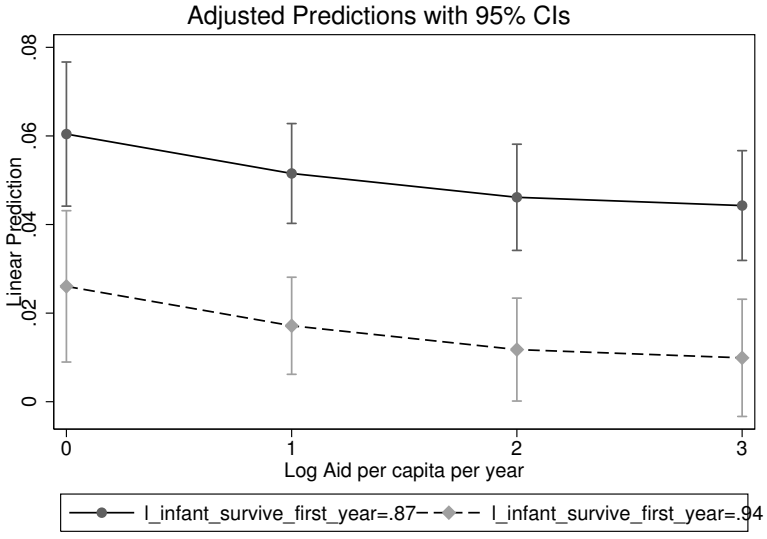


Figure 13: Predicted improvement in Infant Survival, by aid level and need.



6 Discussion

Results on allocation of aid overall suggests there is ethnic targeting, though we do not see the same ethnic rewarding effect in education- or health-specific aid. Relatedly, our examination of aid allocation across sectors does not demonstrate need as a major driver. However, when looking specifically at the health sector and education sector, we found infant survival rate and primary completion rate, respectively, are strong predictors of sector-specific aid allocation. The sector-specific findings suggest need plays a role in aid allocation, but the contrast with findings from overall aid allocation requires further study.

What could potentially explain the differences between aid across sectors and sector-specific aid? Perhaps health and education are donor priority areas, where there is more oversight in aid allocation. It could also be that the donors providing health and education aid projects are more likely to notice and withdraw aid that has been used by the government for political purposes. A closer examination is needed of other aid sectors, which could be more likely to be politically targeted and thus washing out any effects of need that are driving aid allocation in the education and health sectors. The next iteration of the paper will also consider the influence of donor type on aid allocation.

In addition to examining other sectors and donor types, we also plan to incorporate in future analysis government budget data. We expect that in contexts where the government is unable to target aid, they can substitute by targeting budget funding to politically important districts. Including sector-specific budget data can also provide controls that may explain why certain districts may be improving in sectors that are not receiving aid.

Though our analysis of development outcomes do not substantiate aid has an impact, these results are still preliminary. There is some evidence supportive of the argument that aid given to areas with greater need will have a greater impact on improving outcomes. And, in the case of education at least, there is some evidence to support the assertion that aid will

have diminishing returns. We hope expanding analysis to include additional development outcomes and more sectors will shed more light on the impact of aid in improving the human condition.

References

Africa Confidential. 2009. "The rise and rise of ethnic politics." *Africa Confidential* 50(23):9–10.

Alesina, Alberto and David Dollar. 2000. "Who Gives Foreign Aid to Whom and Why?" *Journal of Economic Growth* 5(33–56).

Cammack, Diana. 2012. "Malawi in crisis, 2011–12." *Review of African Political Economy* 39(132):375–388.

Canavire Bacarreza, Gustavo, Peter Nunnenkamp, Rainer Thiele and Luis Triveño. 2005. "Assessing the allocation of aid: developmental concerns and the self-interest of donors.".

Cartwright, Nancy. 2010. "What are randomised controlled trials good for?" *Philosophical studies* 147(1):59–70.

Clemens, M., S. Radelet, R. Bhavnani and Samuel Bazzi. 2011. "Counting chickens when they hatch: the short-term effect of aid on growth." *The Economic Journal* 122(561):590–617.

Cohen, Jessica and Pascaline Dupas. 2010. "Free Distribution or Cost-Sharing? Evidence from a Randomized Malaria Prevention Experiment*." *Quarterly Journal of Economics* 125(1):1–45.

Deaton, Angus. 2010. "Instruments, randomization, and learning about development." *Journal of Economic Literature* 48(2):424–455.

Dionne, Kim Yi and Boniface Dulani. 2013. "Constitutional provisions and executive succession: Malawi's 2012 transition in comparative perspective." *African Affairs* 112(446):111–137.

Dollar, David and Victoria Levin. 2006. "The increasing selectivity of foreign aid, 1984–2003." *World Development* 34(12):2034–2046.

Doucouliagos, Hristos and Martin Paldam. 2008. "Aid effectiveness on growth: A meta study." *European Journal of Political Economy* 24(1):1 – 24.

Easterly, William. 2009. "Can the West Save Africa?" *Journal of Economic Literature* 47(2):373–447.

Hodler, Roland and Paul Raschky. 2010. "Foreign Aid and Enlightened Leaders.". **URL:** *http://ideas.repec.org/p/mos/moswps/2010-54.html*

IMAI, Kosuke and David A. VAN DYK. 2004. "Causal Inference With General Treatment Regimes: Generalizing the Propensity Score." *Journal of the American Statistical Association* 99(467):854–866.

Independent Evaluation Group. 2009. "Annual Review of Development Effectiveness: Achieving Sustainable Development." Washington, D.C.: World Bank.

Jablonski, Ryan S. 2011. "Does Aid Target Votes? How Electoral Strategies Shape the Distribution of Aid." This preliminary draft is prepared for the 2011 Working Group on African Political Economy, Stanford University.

Jomo, Frank. 2013. "Malawians Protest Against Soaring Costs, Slump in Kwacha." Accessed from March 11, 2013.

Juma, Chikondi. 2012. "Gay crusade divides parties." *The Daily Times [Malawi]* .

Levine, Ruth, 'What Works' Working Group and Molly Kinder. 2004. *Millions Saved: Proven Success in Global Health*. Washington: Center for Global Development.

Maganga, Ann. 2009. "The politics of floor crossing and its consequences in Malawi." *Policy Studies Bulletin of the CPS* 10(4):2–8.

Miguel, Edward and Michael Kremer. 2004. "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." *Econometrica* 72(1):159–217. **URL:** *http://dx.doi.org/10.1111/j.1468-0262.2004.00481.x*

Ministry of Finance [Malawi]. 2011. "Malawi Aid Atlas 2010/11FY.".

National Statistical Office [Malawi]. 2005. "Integrated Household Survey 2004-2005.".

Nielsen, Rich. 2010. Does Aid Follow Need? Humanitarian Motives in Aid Allocation. In *Prepared for the Aid Transparency and Development Finance: Lessons from AidData held at University College, Oxford, March 22-25, 2010.* Aid Transparency and Development Finance: Lessons from AidData held at University College, Oxford, March 22-25, 2010.

Peratsakis, Christian, Joshua Powell, Michael Findley, Justin Baker and Catherine Weaver. 2012. "Climate Coded and Geocoded Activity-Level Data from the Government of Malawi's Aid Management Platform." Washington, DC. AidData and the Robert S. Strauss Center for International Security and Law.

Radelet, Steven. 2006. "A Primer on Foreign Aid." Center for Global Development, Working Paper Number 92.

Resnick, Danielle. 2012. "Two Steps Forward, One Step Back: The Limits of Foreign Aid on Malawi. s Democratic Consolidation." UNU-WIDER Working Paper #2012/28.

VonDoepp, Peter. 2012. Malawi. In *Countries at the Crossroads*. Freedom House.

World Bank. 2012. *World Development Report: Gender Equality and Development*. World Bank.

World Bank. 2013. "World Development Indicators." Accessed from on March 11, 2013.

Wroe, Daniel. 2012. "Donors, dependency, and political crisis in Malawi." *African Affairs* 111(442):135–144.