Doing Well by Doing Good: The Impact of Foreign Aid on Foreign Public Opinion

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ABSTRACT

Does foreign aid extended by one country improve that country’s image among populations of recipient countries? Using a multinational survey, we show that a United States aid program targeted to address HIV and AIDS substantially improves perceptions of the U.S. Our identification strategy for causal inference is to use instrumental variables measuring...
the magnitude of the HIV/AIDS problem in aid recipient countries. Our finding implies that in addition to its potential humanitarian benefits, foreign aid that is targeted, sustained, effective, and visible can serve as an important strategic goal for those countries that give it: fostering positive perceptions among foreign publics. By doing good, a country can do well.

**Keywords:** Foreign aid; U.S. foreign policy; HIV; AIDS; PEPFAR; public opinion; instrumental variables

Competition between major powers such as the United States (U.S.) and China for favorable perceptions in global public opinion is increasingly evident today and likely to be a pivotal feature of the emerging international order (Friedberg, 2010; Gill and Huang, 2006; Kurlantzick, 2007; Nye, 2004; Shambaugh, 2008). These countries are eager to develop positive images of themselves among foreign publics, because such images are considered important for achieving a range of objectives in foreign relations (Bustamante and Sweig, 2008; Goldsmith and Horiuchi, 2012; Nye, 2004). Among potential tools states may use to win hearts and minds abroad, foreign aid is often claimed to be effective (American Political Science Association, 2009). ¹

In the context of this intensifying competition for positive images among global publics, in 2003, under the Bush Administration, the U.S. established a foreign aid program called the President’s Emergency Plan for AIDS Relief (PEPFAR), which has been provided to more than 80 developing countries. Its declared objectives include stopping the spread of HIV and AIDS,

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¹ States may use other tools, such as public diplomacy, for the same reason (Goldsmith and Horiuchi, 2009). In this article, we use the term “foreign aid” (or simply “aid”) as a synonym for Official Development Assistance as defined and measured by the Organisation for Economic Co-operation and Development’s Development Co-operation Directorate. Importantly, this definition does not include military aid.
supporting the treatment of people suffering from HIV and AIDS, and mitigating the indirect consequences of the epidemic.\footnote{Funding for PEPFAR was re-authorized in 2008 and it has continued to receive support under the Obama administration, although in a modified form integrated into a broader plan for improving global health outcomes, and with funding levels no longer increasing.}

As then Secretary of State Condoleezza Rice emphasized in her speech at the release of the Fifth Annual Report to Congress on PEPFAR on January 12, 2008, the U.S. government believes that PEPFAR has contributed not only to addressing global health problems but also to improving the U.S. image among publics in recipient countries. Yet, while claims such as this are common, they appear to be based on speculation or anecdotal evidence. Empirically, work on the impact of aid — and more specifically, PEPFAR — on public opinion is scarce. There is little available systematic evidence suggesting that foreign aid improves donor image amongst populations of countries receiving the aid.

In this article, we provide compelling evidence that PEPFAR has, indeed, positively affected how publics in recipient countries regard the U.S. We emphasize two key implications of this finding.

First, it suggests what types of aid, under what conditions, might be effective in influencing foreign public opinion about the donor. Specifically, our theory is that foreign aid that is targeted, sustained, effective, and visible is more likely to affect mass opinion. Recent studies suggest that aid can be effective at encouraging economic growth in recipient countries, although such positive findings remain contested (for example, Doucouliagos and Pal-dam, 2013). Specifically, they suggest that aid promotes economic growth, under certain conditions, at the national (Arndt \textit{et al.}, 2010; Dalgaard and Tarp, 2004; Wright, 2010) or global (Headey, 2008) level; and that the effects of aid are observable over multi-year time periods (Headey, 2008; Minoiu and Reddy, 2010). While much of the existing empirical debate focuses on the economic impacts of foreign aid, our refined theory of aid effectiveness sheds light on the comparatively under-investigated area of aid’s impact on public opinion in recipient countries. This has practical ramifications for international relations, because, as Goldsmith and Horiuchi (2012) show, changes in public opinion within Country B about Country A can influence Country B’s foreign policy behavior toward Country A.

Second, if foreign aid programs have such political ramifications, we suggest a possible virtuous circle or race-to-the-top dynamic for the emerging
global order. As great powers, especially the U.S. and China, are increasingly constrained by the costs that militarized conflicts would impose on their trade and investment interests, they may increasingly seek to pursue their international interests through currying favor among foreign elites and publics. Foreign aid is an obvious potential tool for this. If targeted, sustained, effective, and visible aid gives the best chance of influence, this may compel great powers to actually do good, and to be seen to be doing so, in order to do well in their global competition for influence.

Despite the importance of understanding this sort of impact of foreign aid on public opinion in recipient countries, there have not been many empirical investigations on this topic. This is likely in part due to a methodological challenge researchers inevitably encounter when answering the question of whether an aid program like PEPFAR actually affects opinion about a donor in recipient countries. This difficulty arises because donors never allocate foreign aid across countries at random. Therefore, causal estimates based on naïve regression analysis are likely to be biased due to the possibility that a donor may determine the amounts to be allocated to individual countries based partly on existing public opinion about the donor in these recipient countries or, as much of the existing literature suggests, based on other political or strategic considerations, which are typically unobservable or difficult to measure.

In this article, we tackle this methodological problem and present systematic new evidence. Specifically, our identification strategy for causal inference is to use instrumental variables measuring the magnitude of the HIV/AIDS problem in aid recipient countries. These instruments are strongly correlated with the amount of PEPFAR funding allocated across countries, but are likely to be uncorrelated with unobserved heterogeneity (conditional on a set of observable pre-treatment covariates). By using a large multinational survey with a battery of questions, we also undertake multiple placebo tests and examine whether the treatment variable has a significant effect only on public opinion about the U.S. but not on public opinion about other countries.

The results of our analysis show that PEPFAR substantially improves perceptions of the U.S. in recipient countries, and they are robust to model specifications. Our finding implies that in addition to its potential humanitarian benefits, under certain conditions, foreign aid can serve as an important strategic goal for those countries that give it: fostering positive perceptions among foreign publics. By doing good, a country can do well.
1 Does Foreign Aid Affect Foreign Public Opinion?

There exist a range of reasons why countries give foreign aid. It may be given altruistically to improve economic and social well-being in developing countries, as advocated by Sachs (2005) and practiced to a significant extent by some Northern European countries (Berthélemy, 2006; Gates and Hoeffler, 2004; Hoeffler and Outram, 2011). Alternatively, foreign aid may be used as a tool of direct leverage over political elites to advance commercial or foreign policy goals important to the donor (Alesina and Dollar, 2000; Browne, 2006, Chapter 6; Dreher et al., 2008a, 2011; Kuziemko and Werker, 2006; Radelet, 2006; Vreeland, 2011; Wang, 1999). Finally, foreign aid may be provided at least in part in the hope of creating favorable public perceptions of the donor in recipient countries.

The purpose of this article is to examine the effectiveness of the latter objective of foreign aid, for the case of PEPFAR. In doing this, we complement the existing literatures on aid effectiveness, which examine whether aid delivers development benefits to recipient countries (for example, Arndt and Tarp, 2010; Burnside and Dollar, 2000; Dalgaard and Tarp, 2004; Doucouliagos and Paldam, 2013; Dreher et al., 2008b; Feeny and de Silva, 2012; Headey, 2008; Miniou and Reddy, 2010; Mekasha and Tarp, 2013; Mishra and Newhouse, 2009; Rajan and Subramanian, 2008) and whether aid delivers direct geo-strategic benefits to donors (for example, Dreher and Strum, 2012; Milner and Tingley, 2013; Nowak-Lehmann et al., 2009; Vreeland, 2011).

Theoretically, it is plausible that by instilling gratitude in those it helps or through promoting an image of positive action, compassion and generosity, foreign aid may create or strengthen positive perceptions of donor nations in recipient countries. But there are also reasons to suspect that foreign aid could be an ineffective tool of influence (Adelman, 2011; Lindsay, 2011). Recipients may be unaware of the origins of the aid they receive; the donor’s motivations might be seen as primarily self-serving; the positive feelings associated with aid may be too small to shift perceptions shaped by more salient and dramatic foreign policy behavior; or aid programs may simply fail to work and, therefore, fail to sway people’s opinions in the absence of obvious improvements to their quality of life.

To date, there are only a limited number of empirical studies examining these theoretical possibilities. Furthermore, they are often based on single cases and consequently tend to suffer from a lack of generalizability, or do
not fully control for confounding factors that might render their conclusions invalid. In the following section, we summarize the literature before providing further details on PEPFAR and discussing its potential as a means of fostering improved opinion.

1.1 The Existing Literature

Most of the existing studies that examine aid’s impact on opinion have been within-country case studies. They include studies focusing on U.S. hearts and minds campaigns in conflict zones, such as Iraq and Afghanistan, as well as studies focusing on disaster relief aid after the 2004 Indian Ocean tsunami, the 2005 Pakistan earthquake, or the 2011 earthquake and tsunami in Japan (these are discussed in more detail in the following paragraphs). One statistical paper by Goldsmith et al. (2005) takes a comparative, cross-national perspective, using data from a variety of countries. It is, however, not focused on estimating the effects of a specific foreign aid program. Rather, foreign aid variables are included among a range of independent variables expected to affect post-9/11 international opinion about U.S. foreign policy. Overall, these previous studies on the impacts of foreign aid on public opinion about donors in recipient countries provide mixed results.

A series of qualitative studies has been undertaken through the Feinstein Center at Tufts University, looking at perceptions of aid donors in Kenya and Afghanistan (Bradbury and Kleinman, 2010; Fishstein, 2010; Gompeleman, 2011; Gordon, 2011). While there is some variation across field sites, these studies generally find that aid is ineffective in positively influencing recipients’ perceptions of donors. Importantly, although the Feinstein Center work is thorough and detailed, the external validity of their findings is questionable because their qualitatively oriented studies are based on samples that tend to be small. Furthermore, there is little basis for expecting that similar results to be found in cases beyond the immediate context of Afghanistan and conflict environments.

The generally pessimistic findings of the Feinstein Center studies are consistent with the finding of a large-N quantitative study, also undertaken in Afghanistan, associated with an evaluation of German aid (Böhmke et al., 2010). This study found a weak but statistically significant association between foreign aid and public opinion about the foreign peace-building work. However, this positive relationship disappeared when the survey, originally conducted in 2007, was repeated in 2009.
In a study of aid’s impact on attitudes in the wake of the 2005 Pakistan earthquake, Andrabi and Das (2010) suggest that exposure to foreign assistance had a long-lasting and statistically significant impact on affected villagers’ trust of foreigners. At the same time, however, the authors found that positive perceptions tapered off as distance from the fault line increased, suggesting that the impact was localized among those who benefitted directly from the aid or who came from communities that benefitted.

Outside of academia, changes in surveyed public opinion over time have also been claimed as evidence of aid’s ability to improve public opinion. Commonly cited cases are high-profile U.S. disaster relief aid after the 2004 Indian Ocean tsunami, the 2005 earthquake in Pakistan, and the 2011 earthquake and tsunami in Japan. In all instances, various polls (McCawley, 2006; Terror Free Tomorrow for 2005, 2006; Wike, 2012) show that opinions of the U.S. improved in assisted countries. While such eye-ball studies of before and after comparisons lack the rigor of careful statistical analysis and thus their findings might potentially be spurious, the magnitude and timing of the change in opinion are suggestive. In the case of the Pakistan earthquake, though, changes may have only been transient, with opinions of the U.S. returning to pre-quake levels relatively rapidly (Kinder, 2010).

1.2 Is PEPFAR Effective?

The mixed findings of these studies may in part stem from differing impacts associated with different types of aid. Because foreign aid is given in different forms and in different contexts, it is unlikely that all forms of aid will improve public opinion. PEPFAR differs from those aid programs previously studied in that it is an ongoing aid program, as opposed to a response to a natural disaster or aid extended during a military conflict, and it is given across numerous countries and contexts. Accordingly, its impacts might quite reasonably be different from those found in other studies.

PEPFAR comprises a substantial share of the U.S. development aid budget (approximately 15% in 2009). Although the total amount of U.S. development aid itself is small when contrasted with the total spending the U.S. devotes to the military and other foreign policy activities, we argue that

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3 In 2008, total U.S. aid spending was 0.18% of the country’s Gross National Income (GNI), compared to military spending of 4.32% of GNI. However, due to the size of its economy, the U.S. also donates the largest amount of aid globally (Radelet, 2006).
PEPFAR could nevertheless have positive perceptual “externalities” (indirect effects in a separate policy realm) for the following four reasons.

First, it is targeted at a critical need. The proportion of direct and indirect PEPFAR beneficiaries in the population of a recipient country is expected to be fairly large, particularly in the countries worst affected by HIV and AIDS. This is due to the scale of the HIV and AIDS epidemic. In those countries, the illness has had a major adverse impact on the lives of a significant portion of the population. In Botswana, for example, about a quarter of the population aged between 15 and 49 years was HIV positive in 2009. This figure is high enough to ensure that the disease also impacts many of those not living with HIV and AIDS themselves, as even non-sufferers are likely to have relatives or friends suffering from HIV and AIDS. Moreover, many of the poorest countries receiving PEPFAR funding had, prior to the arrival of large-scale aid, been almost completely unable to provide anti-retroviral therapy (ART) to HIV and AIDS sufferers. But the provision of PEPFAR (and other similar funding) has significantly changed this situation.

Second, PEPFAR aid is sustained over a considerable period of time, which may increase perceptions of genuine commitment by the donor among recipient populations. It also allows for information about the effects of the aid and its source to become more firmly embedded in public perceptions due to repeated exposure to information about PEPFAR. This should operate through basic cognitive “priming” mechanisms (Kolb and Whishaw, 2008), and also through gradual social spread of awareness via word of mouth.

Third, PEPFAR appears to have been effective in reducing the adverse impacts of HIV and AIDS. The U.S. has made considerable efforts to ensure that PEPFAR has been a well-run aid program (El-Sadr et al., 2012; Sepulveda et al., 2007; Simonds et al., 2012). Its objectives are well specified and misuse of the funds by recipients is minimized, if not completely eliminated, through careful monitoring. Indeed, the 2011 WHO/UNAIDS Global HIV/AIDS Response Progress Report argues that the major reason for the decline in AIDS deaths in 2010 since the peak year in 2005 was PEPFAR (Cumming, 2012), and at least two academic studies provide evidence suggesting that PEPFAR has had positive health impacts. Bendavid and Bhattacharya (2009) found that PEPFAR funding has significantly reduced HIV and AIDS related mortality. Numnenkamp and Öhler (2011) found that U.S. bilateral HIV funding (essentially PEPFAR) has a significant impact on HIV related deaths.
Finally, PEPFAR is well publicized and thus visible among publics. The U.S. has made sure that the fund has a high profile in recipient countries as “the leading platform for US health diplomacy and a symbol of American capacity to achieve constructive and beneficial change” (Collins et al., 2012, p. 1578). The U.S. has carefully and deliberately branded PEPFAR funded work to “ensure appropriate recognition for U.S. programs and contributions” (PEPFAR, 2012, p. 2). The stars and stripes of the U.S. flag are a prominent feature of the PEPFAR logo, and the signing of PEPFAR country agreements is often undertaken by high profile figures in the U.S. administration, increasing in-country media exposure and public awareness (Ingram and Kazanecki, 2010).4 In countries with high HIV prevalence rates, PEPFAR has a significant media profile with improvements in HIV outcomes frequently being attributed to PEPFAR (for example, Botswana Gazette, 2011; IOL, 2012; Sambira, 2013; Times of Zambia 2012a; Times of Zambia 2012b; Vo 2008). PEPFAR is also unlikely to be overshadowed, or even rivaled, by other donors’ HIV/AIDS-related aid. The U.S. was the source of 52% of such bilateral aid commitments globally, 2004–2006, while the second largest donor, the U.K., contributed 18% (Henry J. Kaiser Family Foundation, 2013).5

These four characteristics of PEPFAR — targeted to address a critical and widely understood need, sustained delivery of aid over time, effectiveness (or perceived effectiveness), and being highly visible — condition the theoretical contribution of our study. We expect that aid that meets these conditions will be more likely to actually affect opinion among recipient populations about the donor state.

2 Data and Variables

To test whether PEPFAR has an impact on public opinion in recipient countries, we conduct regression analysis. The treatment variable is the per capita amount of PEPFAR funds provided to each recipient country (in natural log). We averaged official statistics over the first three years (2004–2006)

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4 For examples of high profile figures’ visits and their news coverage, see Kanyesigye (2012), Sunday Standard (2011), and Times of Zambia (2012a).

5 We only use PEPFAR data for 2004–2006, but in 2007–2010, the years for which we measure public opinion, the U.S. share of global bilateral HIV/AIDS aid was 59%.
since the disbursement of funds began in 2004. The number of countries receiving PEPFAR funds during this period was 79. By taking the natural log of the highly skewed per capita amount, we exclude countries not receiving any funding during the first 3 years.

The outcome variable is the difference between the percentages (in natural log) of respondents answering “approve” and “disapprove” to the following question asked in Gallup World Polls (GWP): “Do you approve or disapprove of the job performance of the leadership of the United States?”. The GWP is the only available multinational survey with nearly universal coverage of the developing world, repeating the same questions annually about perceptions of the U.S. This question is especially appropriate for our study because it focuses on the evaluation of current or recent U.S. leaders and their behavior. By taking the natural log for both treatment and outcome variables, the estimated treatment effect measures elasticity.

The sampling procedures of the GWP targeted the national population aged 15 or older in each country. Random-Digit-Dial (RDD) phone surveys were conducted where at least 80% of the population has a telephone (primarily in developed countries), while face-to-face interviews were conducted in all other countries. When RDD telephone surveys were conducted, Gallup applied a list-assisted sampling design (Casady and Lepkowski, 1993) with all telephone numbers as the sampling frame. For face-to-face surveys, an area sampling frame was used based on the latest available census data, with a stratified multi-stage random sample based on population units ranging usually from cities with 1 million or more people to villages with under 10,000. The sample size is roughly 1000 surveys per country per year.

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7 As a robustness test, we also run a set of regressions after imputing missing values so that we are able to use a larger number of countries for estimation. See a subsection (Robustness Tests) in the Results Section.

8 We also used a slightly different outcome variable for another robustness test, the results of which are presented in a subsection (Robustness Tests) in the Results Section.

9 For details, see Tortora et al. (2010).
Gallup Inc. launched this annual global public opinion study in 2006, asking the question about U.S. leadership in each year.\textsuperscript{10} For our analysis, we use three outcome variables — the average during the last 2 years of the Bush administration (2007–2008), the average during the first 2 years of the Obama administration (2009–2010), and the average during all the 4 years. The use of these variables allows us to examine whether the PEPFAR funding affected public opinion in recipient countries only when George W. Bush, the founder of the PEPFAR program, was in office, and to be sure that our results are not driven by changing global public opinion about the U.S. resulting from the election of Barack Obama.

Because it is likely to have taken time for PEPFAR's positive health impacts to become clearly apparent, any effects of providing PEPFAR funds over multiple years on public opinion in recipient countries are expected to be gradual and cumulative. In other words, we assume that any short-term change (for example, a change from the previous year) in PEPFAR funds does not abruptly cause a short-term change in public opinion about the donor among recipient countries. For this reason, we take the averaged values for both treatment and outcome variables and run cross-sectional (i.e., cross-country) regressions.\textsuperscript{11}

To increase confidence in our causal inference, we use instrumental variables (IVs) that are expected to influence public opinion about the U.S. only through the treatment variable (the amount of per capita PEPFAR funding). The use of instrumental variables is often an effective way to address the issue of endogeneity using observational data. Specifically, we use the HIV prevalence rate (the average of 2000–2003, in natural log) and the number of annual HIV related deaths divided by the total population (the average of 2000–2003, in natural log).\textsuperscript{12} HIV prevalence and death-rate data were

\textsuperscript{10} The number of countries in which this specific question was asked was 119 in 2006, 93 in 2007, 114 in 2008, 112 in 2009, and 115 in 2010. The country-level aggregated data were obtained at <https://worldview.gallup.com/>.

\textsuperscript{11} Previous studies have shown that general ODA's effects on economic growth are better modelled over periods of several (specifically, four) years (Burnside and Dollar, 2000; Headey, 2008).

\textsuperscript{12} The data source for the HIV prevalence rate and the number of annual HIV related deaths is UNAIDS Data obtained at <http://unaid.org/globalreport/documents/HIV_Estimates_GR2010_1990_2009_en.xls>. If the reported HIV prevalence rate is “<0.1” percentage, we assigned a random number between 0 (exclusive) and 0.1 (exclusive). Similarly, if the reported number of deaths is “<1000”, “<500”, “<200”, or “<100”, we assigned a random number within the possible range for each observation. The total population (2000–2003 average), the denominator for the second instrumental variable, is from the World Bank’s WDI (see Footnote 6).
used extensively in designing PEPFAR’s approach, including the selection of recipient countries, and setting annual funding levels (Lyerla et al., 2012). As would be expected, our instruments are therefore strongly correlated with the treatment variable — the per capita amount of PEPFAR funding (the average in 2004–2006).

Assuming they are valid, our instruments estimate the “local average treatment effect” (Imbens and Angrist, 1994). Formally, we estimate the average cross-country effects of the variation in PEPFAR funding, which is determined by the variation in these health indicators, rather than by other motivations such as geo-strategic selection, on foreign public opinion. In other words, we have considerable confidence that we estimate the effect of foreign aid targeted to need on public opinion. The allocation of PEPFAR funds may be politically determined to some degree, but our IV estimates are unrelated to such political considerations.

An important assumption in this analysis is the exclusion restriction, an assumption that instruments can be excluded from the second-stage regression because they are uncorrelated with the error term, conditional on other covariates included in the model. To make this assumption plausible, we need to add variables that are expected to correlate with our instrumental and outcome variables.\(^\text{13}\)

First, U.S. total Official Development Assistance (ODA) per capita (in natural log, averaged over 2004–2006) is the total aid funding received in each recipient country from the U.S. (gross disbursements, current million U.S. dollars) divided by the total population (in millions).\(^\text{14}\) Including this variable ensures that any impact on opinion is a result of PEPFAR and not of other aid programs designed in part to address public health problems in developing countries.

Second, the U.S. may provide more PEPFAR funds to poorer economies and/or poorly governed countries, and these countries are also likely to have more severe public health problems. To control for these possibilities, we add GDP per capita (2004–2006 average, in natural log).\(^\text{15}\) For similar reasons,

\(^\text{13}\) We considered using a wide range of variables. See a subsection (Robustness Tests) in the Results Section for more details.

\(^\text{14}\) The data source of ODA disbursements is OECD DAC CRS Aid Database, obtained at <http://www.oecd.org/document/33/0,2340,en_2649_34447_36661793_1_1_1_1,00.html#dac>. See Footnote 12 for the source of total population.

\(^\text{15}\) The data source is the World Bank’s WDI (see Footnote 6). Specifically, the variable we use is GDP per capita, PPP (constant 2005 international dollars).
we control for the level of civil liberties and the quality of governance, using the Freedom House civil liberties score (2004–2006 average),\footnote{The data source is Freedom House, Freedom in the World Country Rankings, obtained at \url{http://www.freedomhouse.org/template.cfm?page=439}. An alternative measure of the level of political development is polity score from Polity IV data. We, however, prefer to use the Freedom House’s score, as there are no missing values for countries included in our analysis. The two variables are highly correlated ($r = 0.81$).} as well as a compositional score based on 6 World Bank Governance Indicators (2004–2006 average).\footnote{The data source is Teorell \textit{et al.} (2011). The original source is Kaufmann \textit{et al.} (2009) available at \url{http://www.govindicators.org}. Because the 6 indicators are highly correlated, we measured a Cronbach’s alpha. The reliability coefficient is 0.97.} We also include a dummy variable for sub-Saharan African countries to control for unobserved region-specific covariates.\footnote{We generate a dummy variable based on a variable indicating the region of the country in Teorell \textit{et al.} (2011). The original source is Teorell and Hadenius (2005).}

Because the global HIV and AIDS epidemic is most acute in Sub-Saharan Africa and because much of the PEPFAR funding has been directed to countries in this region, this variable is essential to ensure that our results are not driven by other, unobserved, region specific characteristics.

Third, the problems associated with HIV and AIDS in a given country may affect that country’s economic and political relationships with the U.S. (and then, in turn, the country’s public opinion about the U.S.) Specifically, the U.S. tends to have weaker trade ties with countries with more severe public health problems. This may be because these countries are economically closed and/or because they lack goods to export to the U.S. These countries also tend to have weaker political ties with the U.S., perhaps because of their small presence in political and economic negotiations at international arenas. To account for these connections, we use 3 variables. The first 2 are imports to the U.S. from a given country as a percentage of total U.S. imports (in natural log), and exports from the U.S. to a given country as a percentage of total U.S. exports (in natural log).\footnote{Fleck and Kilby (2006) use these variables to capture the impact of trade with the U.S. on U.S. aid allocation decisions. The data source is U.S. Department of Commerce, Bureau of the Census, Foreign Trade, obtained at \url{http://www.census.gov/foreign-trade/balance/}. Another commonly used indicator for the trade ties with the U.S. is the sum of exports to the U.S. and imports from the U.S. as the percentage of GDP. This variable, however, is found to be very weakly correlated with our instrumental variables.} As a proxy for each recipient country’s political connection to the U.S., we add a variable measuring accordance of each country’s United Nations General Assembly (UNGA) voting pattern with that of the U.S.\footnote{The data source is Dreher and Sturm (2012), obtained at \url{http://www.uni-heidelberg.de/fakultaeten/wiso/awi/professuren/intwipol/datasets_en.html}. The measure used is the pro-}
Conditional on these covariates, we argue, it is unlikely that our instrumental variables (HIV/AIDS rates) would have any impact on the outcome variable (public opinion about the U.S. leadership) through any mechanism other than their impact through the treatment variable (PEPFAR). In other words, having accounted for these covariates, we have confidence that our instrumental variables are not systematically correlated with the error term in the second-stage regression. Ultimately, the validity of this exclusion restriction assumption is an empirical matter, and thus we conduct a set of standard specification tests.

3 Results

Figure 1 shows the results of our first-cut analysis — simple scatter plots using the outcome variable and the treatment variable. Each panel in this figure corresponds to one of three periods used for analysis (i.e., 2007–2010, 2007–2008, or 2009–2010). The straight lines are OLS regression lines. All these lines have a positive slope, and the estimated slope coefficients from simple bivariate regressions (0.26 for 2007–2010, 0.27 for 2007–2008, and 0.32 for 2009–2010) are highly significant at the 99% level. The magnitude of the effect is substantial and similar across the last 2 years of the Bush administration and the first 2 years of the Obama administration. Specifically, regardless of who the U.S. president was at the time of the surveys, doubling the per capita amount of PEPFAR funds increased the ratio of the percentages of Approve and Disapprove by about 30%. For example, if the percentage of Approve was initially 40%, the estimated coefficients suggest that it would increase to 52%.21

3.1 Estimated Treatment Effects

Table 1 shows the results of two-stage least square (2SLS) regressions. The effect of PEPFAR funds per capita on the perception of U.S. leadership is

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21 This simple interpretation assumes that PEPFAR increases the percentage of Approve while keeping the percentage of Disapprove constant. PEPFAR may also decrease the percentage of Disapprove, but understanding the impacts of PEPFAR on the composition of percentages is beyond the scope of this article. The average percentages of Approve and Disapprove for the period of 2007–2010 were 45.8% and 31.2%, respectively. The remaining percentage includes respondents who either chose “Don’t know” or refused to answer.
positive and statistically significant at the 99% level of confidence for the 2007–2010 period overall, as well as for the final Bush years, 2007–2008. It is significant at the 95% level during the initial Obama years, 2009–2010.\footnote{We experimented with many different sets of control variables, but the results, discussed shortly, are similar.}
Table 1. Results of 2SLS regressions.

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<td>PEPFAR funds per capita (log)</td>
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<td>US total ODA per capita (log)</td>
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<td>GDP per capita (log)</td>
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<tr>
<td>World Bank governance indicator</td>
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<td></td>
<td>[0.151]</td>
<td>[0.166]</td>
<td>[0.158]</td>
</tr>
<tr>
<td>Africa dummy</td>
<td>0.804</td>
<td>0.698</td>
<td>0.973</td>
</tr>
<tr>
<td></td>
<td>[0.318]</td>
<td>[0.311]</td>
<td>[0.428]</td>
</tr>
<tr>
<td>Imports to US (% of total US imports, log)</td>
<td>0.080</td>
<td>0.125</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>[0.089]</td>
<td>[0.096]</td>
<td>[0.091]</td>
</tr>
<tr>
<td>Exports from US (% to total US exports, log)</td>
<td>−0.052</td>
<td>−0.118</td>
<td>−0.073</td>
</tr>
<tr>
<td></td>
<td>[0.130]</td>
<td>[0.141]</td>
<td>[0.152]</td>
</tr>
<tr>
<td>UN voting in accordance with US</td>
<td>0.970</td>
<td>0.476</td>
<td>0.531</td>
</tr>
<tr>
<td></td>
<td>[0.693]</td>
<td>[0.697]</td>
<td>[0.770]</td>
</tr>
<tr>
<td>Constant</td>
<td>4.089</td>
<td>4.710</td>
<td>1.439</td>
</tr>
<tr>
<td></td>
<td>[1.719]</td>
<td>[1.909]</td>
<td>[1.783]</td>
</tr>
<tr>
<td>Number of countries</td>
<td>57</td>
<td>55</td>
<td>46</td>
</tr>
<tr>
<td>Wald Chi-square</td>
<td>122.41</td>
<td>109.83</td>
<td>122.37</td>
</tr>
<tr>
<td>R-square</td>
<td>0.572</td>
<td>0.550</td>
<td>0.677</td>
</tr>
<tr>
<td>Root MSE</td>
<td>0.685</td>
<td>0.737</td>
<td>0.591</td>
</tr>
</tbody>
</table>

Note: The outcome variable is the log ratio of Approve (%) and Disapprove (%) responses to the question: “Do you approve or disapprove of the job performance of the leadership in the United States?”. Numbers in brackets are robust standard errors.

estimated marginal effects are slightly smaller than those based on simple bivariate OLS (shown in Figure 1) but still substantial. Specifically, if the per capita amount of PEPFAR funding doubles, the ratio of Approval to Disapproval increases by 20–23%. Importantly, we re-emphasize, the effects
Table 2. Results of specification tests.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Robust score Chi-square</td>
<td>0.481</td>
<td>1.539</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>(0.488)</td>
<td>(0.215)</td>
<td>(0.766)</td>
</tr>
<tr>
<td>Robust regression F</td>
<td>0.406</td>
<td>1.323</td>
<td>0.070</td>
</tr>
<tr>
<td></td>
<td>(0.527)</td>
<td>(0.256)</td>
<td>(0.792)</td>
</tr>
<tr>
<td>Test of relevance of instruments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial $R$-square (first-stage regression)</td>
<td>0.452</td>
<td>0.449</td>
<td>0.387</td>
</tr>
<tr>
<td>$F$ (first-stage regression)</td>
<td>25.509</td>
<td>23.877</td>
<td>15.505</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Test of over-identification restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-square</td>
<td>0.812</td>
<td>1.104</td>
<td>0.315</td>
</tr>
<tr>
<td></td>
<td>(0.368)</td>
<td>(0.293)</td>
<td>(0.574)</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses are $p$ values. Also see Note in Table 1.

of PEPFAR on public opinion in recipient countries are independent of the U.S. President’s popularity, partisanship and of any perceived policy differences between Bush and Obama.23

As expected, a set of specification tests (shown in Table 2) suggests that our instruments are highly valid empirically. The small values of test statistics for endogeneity — Wooldridge’s (1995) robust Chi-square score test and a robust regression-based $F$ test — imply that our treatment variable

---

23 The negative — but statistically insignificant — association of total U.S. ODA per capita with opinion about U.S. leadership might be related to the various strategic purposes for which some U.S. aid is given (Dreher et al., 2008a; Gates and Hoeffler, 2004). The mixed goals of promoting U.S. foreign policy may cause U.S. aid to be less effective at promoting development (Headey, 2008). Specifically, U.S. aid may be extended to more corrupt (Alesina and Weder, 2002) and/or less democratic regimes, and to those that violate human rights, to a greater extent than is the case for most other major bilateral donors (Hoeffler and Outram, 2011). Thus, U.S. ODA might be perceived in some recipient countries as ineffective, and complicit in propping up dysfunctional or repressive regimes. It is worth further investigating such potentially negative effects of more general U.S. aid on opinion about the U.S. in recipient countries, but we leave it for future research.
(PEPFAR funds per capita) does not need to be considered as endogenous.\footnote{For this reason, we also estimated our model based on OLS. See a subsection (Robustness Tests) in the Results Section.}
The partial $R^2$ statistics in the first-stage regression range from 0.39 to 0.45. Thus, the instruments explain 39–45% of the first-stage regression's overall goodness of fit. The $F$ statistics for the joint significance of the instruments in the first stage range from 15.5 to 25.5 and are highly significant. They are larger than 10, which Stock \textit{et al.} (2002) suggest as the benchmark to assess the reliability of 2SLS estimates for causal inference (when there is one endogenous variable).

We also conducted over-identification tests to examine whether the instruments are uncorrelated with the error term. Sargan’s (1958) and Basmann’s (1960) Chi-square test statistics are very small. The associated high $p$ values indicate that the exclusion restriction assumption is empirically supported.

### 3.2 Placebo Tests

To further ensure that no additional unobserved factors are driving our results, we also conducted placebo tests — also called “control-outcome” tests (Rosenbaum, 2010) — using similar-but-different outcome variables. Given that we do not expect PEPFAR aid to have an effect on opinions about other countries, besides the U.S., these tests “exploit the anticipated absence of an effect to provide information about unmeasured biases” (Rosenbaum, 2010, p. 121). They are based on identical questions about the approval of leadership of (“Do you approve or disapprove of the job performance of the leadership of ...?”) China, France, Germany, India, Japan, Russia, the United Kingdom, and the respondent’s home country. As in the case of the U.S., each “non-equivalent dependent variable” (Cook and Campbell, 1979, Chapter 2) measures the 2007–2008, 2009–2010, or 2007–2010 average difference between the percentage of Approval (in natural log) and the percentage of Disapproval (in natural log).

Table 3 shows the estimated marginal effects of the treatment variable on these 9 outcome variables. The only statistically significant effects (at the 99% or 95% level) were obtained for the outcome variable measuring the Approval vis-à-vis Disapproval of leadership of the U.S. These tests further support our expectation that PEPFAR affects public opinion specifically
Table 3. Results of placebo tests.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>0.202</td>
<td>0.229</td>
<td>0.226</td>
</tr>
<tr>
<td></td>
<td>[0.068]</td>
<td>[0.080]</td>
<td>[0.091]</td>
</tr>
<tr>
<td>China</td>
<td>−0.012</td>
<td>0.028</td>
<td>−0.042</td>
</tr>
<tr>
<td></td>
<td>[0.050]</td>
<td>[0.055]</td>
<td>[0.082]</td>
</tr>
<tr>
<td>France</td>
<td>−0.060</td>
<td>−0.064</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>[0.059]</td>
<td>[0.059]</td>
<td>[0.088]</td>
</tr>
<tr>
<td>Germany</td>
<td>−0.058</td>
<td>−0.069</td>
<td>−0.055</td>
</tr>
<tr>
<td></td>
<td>[0.052]</td>
<td>[0.062]</td>
<td>[0.079]</td>
</tr>
<tr>
<td>India</td>
<td>−0.021</td>
<td>−0.015</td>
<td>−0.086</td>
</tr>
<tr>
<td></td>
<td>[0.063]</td>
<td>[0.076]</td>
<td>[0.067]</td>
</tr>
<tr>
<td>Japan</td>
<td>−0.018</td>
<td>−0.018</td>
<td>−0.006</td>
</tr>
<tr>
<td></td>
<td>[0.052]</td>
<td>[0.060]</td>
<td>[0.079]</td>
</tr>
<tr>
<td>Russia</td>
<td>−0.043</td>
<td>−0.026</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>[0.101]</td>
<td>[0.098]</td>
<td>[0.191]</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.093</td>
<td>0.111</td>
<td>−0.021</td>
</tr>
<tr>
<td></td>
<td>[0.080]</td>
<td>[0.087]</td>
<td>[0.095]</td>
</tr>
<tr>
<td>Own country</td>
<td>−0.128</td>
<td>−0.122</td>
<td>−0.123</td>
</tr>
<tr>
<td></td>
<td>[0.075]</td>
<td>[0.074]</td>
<td>[0.153]</td>
</tr>
</tbody>
</table>

Note: The estimated effects of PEPFAR funding per capita (log, 2004–2006 average) on the difference in the percentage of “approve” (in log) and “disapprove” (in log) responses to the following question asked in Gallup World Polls (2007–2010 average, 2007–2008 average, or 2007–2010 average): “Do you approve or disapprove of the job performance of the leadership of <China, France, Germany, India, Japan, Russia, the United Kingdom, the United States, or Own Country>?”. Numbers in brackets are robust standard errors.

about the U.S. in recipient countries, and the relationship is not the result of confounding factors.

There is a theoretical rationale for these empirical results. While donor countries tend to give aid to combat HIV/AIDS to those states that are most affected by the epidemic, there is also a substitution or free-riding dynamic in which other donors give less to a specific recipient state when one donor
gives a larger amount (Gaibulloev and Sandler, 2012). This could also be due to explicit multilateral coordination among donors. Given that the U.S. is the largest such donor, this implies that other donors give relatively less HIV/AIDS-related aid to the states receiving more from the U.S., which would support our expectation that public opinion about other countries would not be significantly related to PEPFAR funding provided by the U.S.

Interestingly, however, the effects on the leadership Approval vis-à-vis Disapproval ratio in a respondent’s own country are negative and significant at the 90% level (for 2007–2010 and 2007–2008). The publics in countries receiving large PEPFAR funds may assess the relative performance of their country’s leaders in comparison to that of the U.S. leaders who provide — or are perceived to provide — effective foreign aid. These barely significant effects are, however, not robust. Among many model specifications we tried, they are more often insignificant (even at the 90% level) than significant.

3.3 Robustness Tests

We also ran a range of other regression models for further robustness tests. First, building on the initial bivariate correlations reported with the scatter plots in Figure 1 at the beginning of this section we estimated our model using multiple regression (i.e., without instruments). The results are presented in Appendix A (Table A). The effects of PEPFAR funds per capita are slightly smaller, ranging from 0.15 to 0.17, but are still highly significant at the 95% level in all the three periods of investigation. The similarity between the 2SLS and OLS regression results is what we expect, given that the test results for endogeneity suggest that we do not necessarily need to treat the per capita amount of PEPFAR funds as endogenous, conditional on the covariates included in our estimation.

Second, we tried an alternative outcome variable; specifically, the difference between the Approval percentage and the Disapproval percentage without taking the natural log. The results shown in Appendix B (Tables B1 and B2) are quite similar. The effects of our treatment variable are positive and significant at the 99% or 95% level. The results of specification tests are also similar.25

25 The Chi-square statistic for the test of over-identification restrictions is large (3.005) enough to reject the null hypothesis at the 90% level but not at the 95% level.
Third, we randomly imputed small numbers for countries not receiving PEPFAR funds and/or other foreign aid programs.\(^{26}\) This is aimed at testing whether our results are driven by non-random exclusion of countries not receiving aid by taking the natural log of the highly skewed per capita amount of PEPFAR or total ODA. The results are presented in Appendix C (Tables C1 and C2). By imputing the missing values, we substantially increase the number of observations. All three coefficients of PEPFAR funds per capita are positive and statistically significant at the 95% level for 2007–2010, 90% for 2007–2008, and 99% for 2009–2010. The magnitude of the effects is slightly smaller for 2007–2010 and 2007–2008, but almost exactly the same for 2009–2010.

Finally, we considered using other pre-treatment covariates aimed to satisfy the exclusion restriction assumption. They include the geographical distance from the U.S., variables measuring the amount of U.S. military aid, a dummy variable for United Nations Security Council members, a dummy variable for former U.S. colonies, a dummy variable for Latin American countries, a dummy variable for Egypt, and the percentage of Muslims in each country’s population. Adding these variables individually or jointly does not substantially change our main results, although doing so tends to increase the standard errors of the coefficients for our treatment variable. To avoid this problem of inefficiency, for our main results reported in Tables 1 and 2, we decided to keep a variable not only when there was a theoretical reason to include it, but also when its pairwise correlation with one of our instrumental variables was statistically significant at the 95% level. None of these additional pre-treatment covariates satisfied our criteria, and thus we did not include them in our main analysis.

4 Conclusion

These findings provide robust evidence that PEPFAR has had a strong positive effect on how U.S. leadership has been perceived in recipient countries. The results of specification tests, placebo tests, and robustness tests suggest

\(^{26}\) Specifically, for each period of investigation (2007–2010, 2007–2008, or 2009–2010), we calculated the minimum amount of PEPFAR funds per capita or U.S. total ODA per capita. For each of the countries not receiving PEPFAR or other aid programs, we imputed a random number ranging from 0 (exclusive) to the observed minimum value. After imputing these missing values, we took the natural log of each variable.
that the observed effects are not statistical artifacts, and thus we are strongly inclined to believe that they are causal. Our theory is that these empirically robust results stem from the fact that PEPFAR is targeted to address a widely understood need; has been sustained over some time; is — and is perceived to be — effective; and is highly visible.

Whether, and the extent to which, these conditions apply individually and/or jointly are important questions for future investigation. At present, such investigations aimed to identify the mechanisms through which PEPFAR has had its impact are limited by the absence of individual-level (or household-level) survey datasets. Once such data become available, further work could examine, for example, whether positive perceptions are higher among those impacted directly (i.e., suffering from HIV and AIDS or the families of sufferers) and/or among those with better access to media and the publicity of PEPFAR.

In addition to further work looking inwards, there is considerable scope for further work looking outwards. Specifically, one important way our approach could be extended is by testing whether other aid programs targeted to important needs, sustained over time, perceived as effective, and well-publicized or otherwise visible to the population are also positively associated with opinion about the U.S. Another would be to examine this relationship for other donor countries. Give the large absolute amounts of aid the U.S. provides, it remains an open question whether other donors’ extant smaller programs might affect perceptions within recipient countries about these donors.

Another promising area of further investigation stemming directly from this article would be to study other humanitarian aid programs addressing global health issues that have been successful in tackling other major illnesses, such as small pox, polio, river blindness, and malaria. While there are many examples of aid failing to provide benefits, PEPFAR is not unique in its achievements. Indeed, there are other well-documented examples of aid having significant positive impacts (for example, Demombynes and Trommlerova, 2012; Levine, 2007). Thus, future work should seek to extend our analysis across a range of programs.

Having acknowledged some limitations and future research directions, we underscore that our analysis is the first of its kind to use cross-country data to make systematic causal inference about the impacts of aid on public opinion in aid recipient countries. Our findings suggest that policy debates
about PEPFAR and similar programs should consider not only their efficacy in achieving direct goals such as fighting HIV and AIDS, but also their value in improving the donor country’s global or regional standing.

Beyond the literature on aid effectiveness, our research has broader implications for understanding today’s international relations. If analysts are correct that national image is increasingly a key resource for great powers’ international influence, our findings may be good news. With militarized confrontation tempered by high economic interdependence (for example, between China and the U.S. today, but unlike the U.S. and USSR during the Cold War), great powers might now start learning to place more emphasis on improving their image through aid, because it enhances their power. Our research shows that one possible means of doing well in the newly forming arena of international competition for favorable perceptions is by actually doing good.

References


