Modeling the "Gravity" of Foreign Aid: A Dyadic Panel Analysis on the Impact of Bilateral Aid Commitments on Bilateral Immigration from 1994 to 2011

Miles D. Williams

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Modeling the "Gravity" of Foreign Aid:

A Dyadic Panel Analysis on the Impact of Bilateral Aid Commitments on Bilateral Immigration from 1994 to 2011

(TITLE)

BY

Miles D. Williams

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MODELING THE “GRAVITY” OF FOREIGN AID

A Dyadic Panel Analysis on the Impact of Bilateral Aid Commitments on Bilateral Immigration from 1994 to 2011

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ABSTRACT

While research shows policymakers increase bilateral foreign aid commitments in response to an increase in bilateral immigration, supposedly as a means for reducing the demand for immigration, the effectiveness of this strategy is given only passing consideration in the literature. Many doubt this approach’s success, but little effort has been made to empirically justify this doubt. This paper attempts to fill this gap in the literature and proposes a novel hypothesis. It is argued here that aid, more than simply failing to promote development quickly enough to reduce the demand for immigration, functions as a signal of donor wealth. When donors increase the amount of aid they commit to a given migrant sending country, residents in said country interpret that increase in aid as an indication of greater economic opportunity in the donor, thereby influencing would-be migrants’ perceptions of the balance of wealth and resources between donor and recipient, tilting the cost-benefit ratio associated with leaving versus staying in favor of leaving. Using a dyadic panel dataset for 18 donor countries and 130 aid recipient countries from 1994 to 2011, a gravity-type equation is estimated using both ordinary least squares and Tobit. The results support this hypothesis, but a number of caveats are considered. Aid’s positive pull on immigration does not appear to be contingent on past colonial ties, common language, and the aid recipient’s political regime. Furthermore, aid’s effect does not appear to be contingent on either bilateral distance or the restrictiveness of the donor’s immigration policies; however, its marginal effect does seem to slightly diminish in response to an increase in each. Further analysis reveals a potentially curvilinear relationship between aid and immigration. Implications for policymakers and future research are discussed.
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1. INTRODUCTION

From 1985 to 2014, the net official development assistance (ODA) in current US dollars received by ODA recipients increased from 6.66 dollars to 22.2 dollars per capita (World Bank 2016). In absolute terms, this represents an increase from 32.23 billion dollars in 1985 to 161.1 billion dollars in 2014. At the same time, according to the World Bank, as of 2015 the number of international migrants increased by more than 138 million since 1985 (2016). While this increase, when taken as a percentage of the world population, represents a mere jump from 2.89 percent to 3.33 percent, the effects of this increase are no less felt both in destination countries and in migrant-senders. However, despite the large amounts of aid flowing from donors to developing countries and the simultaneous flow of large numbers of migrants from aid recipients to donors, the relationship between migrant flows and foreign aid remains understudied.

Ideally, foreign aid ought to improve economic conditions in migrant-sending countries, thereby lowering the perceived gains of leaving one’s homeland to take advantage of more favorable work and living conditions in wealthier developed countries. For this reason, some state leaders may view foreign aid as a policy tool for curbing the demand for immigration. Recent work by Bermeo and Leblang (2015) is among the first to explore the possibility that policymakers in developed countries make use of this strategy. Their work provides compelling and robust evidence that state leaders increase aid commitments in response to an increase in the stock of migrants living in their country from an aid recipient, supposedly as a part of a strategy to promote development and thereby reduce immigration.

Although, whether aid in fact has such an effect on immigration remains
uncertain. The supposed ability of foreign aid to reduce the demand to migrate is premised upon the assumption that foreign aid sufficiently improves opportunities for employment, greater income, and higher living standards in the aid recipient, yet little strong evidence exists to suggest that foreign aid can accomplish this in the short-term. Nevertheless, while some have expressed skepticism about whether an increase in foreign aid reduces migrant inflows (Faini and Venturini 1993; de Haas 2007; Bermeo and Leblang 2015), to this author's knowledge, none have undertaken a systematic empirical study of the effects of foreign aid on immigration. While researchers Hatzipanayotou and Michael (2012) have developed a model of donor-recipient relations and have proposed that an increase in foreign aid sent from a donor country to a recipient country increases the opportunity cost of immigration, their model remains untested, and their hypothesis is in the minority. By and large, scholars to date seem to have taken it as a given that aid has little to no impact on immigration, and therefore they see no need to take the additional step of thoroughly testing this assumption against empirical evidence.

The lack of serious consideration of the relationship between foreign aid and immigration furthermore has left an alternative hypothesis unaddressed. Plausibly, an increase in foreign aid could decrease the perceived opportunity cost of immigration, thus leading to an increase in migrant inflows. Provided foreign aid fails to sufficiently improve conditions in an aid recipient—thus failing to make emigration seem less appealing—aid allocated from a donor (X) could potentially serve as one among many factors that signal to residents in a recipient (Y) that X has greater resources and greater wealth than Y. Moreover, supposing foreign aid signals greater wealth in X relative to Y, one would expect that in response to an increase in foreign aid sent from X to Y,
migration from Y to X would increase, *ceteris paribus*. In other words, bilateral aid may function as a gravitational-like force, the effect of which is estimable via a "gravity-type" model similar to others present in the literature (Fitzgerald, Leblang, and Teets 2014; Mayda 2010; Ortega and Peri 2009; Gogger and Hansen 2008; Clark, Hatton, and Williamson 2007).

Furthermore, assuming aid functions as a signal of a donor's greater wealth in relation to a recipient, it further seems plausible that aid's positive relationship with migration may be amplified when a donor and recipient share certain social ties and when a recipient is a democracy. If a donor and recipient share a colonial past or share a common language, such ties may improve the likelihood that residents of a recipient are made aware of changes in aid sent from a donor. Also, if a recipient is a democracy, this may also improve the chances that residents in a recipient are made aware of changes in aid sent from a donor because democratic countries may have more open access to transnational social networks and to information from abroad.

In addition to these hypotheses, I also consider two research questions related to the interaction of aid commitments with bilateral distance and with donor migration policy restrictiveness. Bilateral distance and donor migration policy restrictiveness may impact the marginal effect of bilateral aid, possibly reducing the strength of its "gravitational" pull on bilateral migrant inflows. At the same time, an increase in bilateral aid might reduce the marginal impact of bilateral distance and donor migration policy restrictiveness.

To test these hypotheses and answer these research questions, I develop a model of donor-recipient relations where, controlling for the effect of numerous covariates as
well as donor time-invariant and recipient time-variant fixed effects, the impact of the natural log of (one plus) bilateral aid commitments from a donor to a recipient at year $t-1$ on the natural log of (one plus) migrant inflows from an aid recipient to a donor at year $t$ from 1994 to 2011 is estimated using ordinary least squares (OLS) with standard errors clustered by dyad. I also use Tobit estimation as a check against biased OLS estimates since the dependent variable (migrant inflows) displays left censoring at 0.

The results from model estimation offer support for the hypothesis that aid positively predicts an increase in migrant inflows. Controlling for a number of factors shown in the migration literature to be relevant predictors of immigration, I find that the effect of aid on migrant inflows is both positive and statistically significant. However, the results fail to reject the null for the remaining hypotheses, suggesting there is no additive interaction effect when foreign aid’s impact is contingent on a shared colonial past, a common language, and the political regime in a recipient.

Regarding the research questions, further analysis of the effect of aid, contingent of bilateral distance and donor migration policy restrictiveness, shows that when the effect of aid is interacted with these other important factors that push against immigration, the result is insignificant; however, the marginal effect of aid does seem to diminish when there is greater bilateral distance between donor and recipient and when a donor has more restrictive immigration policies. Conversely, contrary to what might have been expected, an increase in bilateral aid is associated with an increase in the negative marginal effects of both greater bilateral distance and more restrictive donor immigration policies. There is, however, a substantial degree of variance in the marginal impact of each of these factors, suggesting that these results, though interesting, fail to
permit stout generalizations. However, these results may hint that foreign aid's positive impact on bilateral migrant inflows yields diminishing returns. If so, this would suggest the relationship between foreign aid and immigration is not linear but curvilinear.

To test this possibility, I estimate a quadratic model using both OLS and Tobit and find that bilateral foreign aid does, indeed, appear to have a curvilinear relationship with immigration: that is, as aid increases, it at first is associated with an increase in bilateral migrant inflows, but its effect eventually peaks and is then associated with a decline in bilateral migrant inflows. Though more research needs to be done to better understand why the relationship between aid and immigration is quadratic, I offer two potential explanations: 1) there is a finite pool of potential migrants residing in aid recipients, and as the number of actual migrants per recipient increases the rate of migrant outflows eventually slows and levels off, at which point a continued increase in foreign aid experiences a decline in its marginal effects, thereby increasing the marginal impact of other factors that have a negative impact on immigration; 2) donors are more likely to allocate greater amounts of aid to recipients that are more likely to make good use of that aid, and by putting aid to good use, the opportunity cost of emigrating for residents of these recipients favors remaining rather than emigrating, thereby making the positive pull of bilateral aid seem less important relative to the costs associated with greater bilateral distance and more restrictive donor immigration policies. It is highly likely that some combination of these two views can explain the quadratic relationship between aid and immigration; however, at this point these explanations are merely speculative.

Following the quantitative analysis, I turn to a selection of cases from my larger
dataset and consider the validity of my results in the context of this narrower set of data.

I look specifically at France and its bilateral relationship with three of its former North African colonies (Algeria, Morocco, and Tunisia) and at Britain and its bilateral relationship with three of its former South Asian colonies (India, Pakistan, and Sri Lanka). I explore the predictive power of the quadratic model estimated during my quantitative analysis and test the extent to which foreign aid can account for bilateral migrant inflows in each of these cases. I further consider variation in the impact of aid for Britain and its former colonies versus France and its former colonies by estimating models using data from each of these cases.

The results show that the model estimated for the larger dataset offers a fairly reliable fit for the dependent variable; however, analysis using the smaller set of cases finds that aid has a statistically significant estimated effect on immigration in the context of Britain and its South Asian aid recipients but not in the context of France and its North African aid recipients. These findings suggest that while aid may have a positive impact on immigration overall, it should not be taken as a given that it will always have such an effect; concurrently, its potential effect also should not be ignored.

Though limited, the results from this research help to fill a notable gap in the literature on the factors that motivate bilateral migrant flows. The positive, though curvilinear, dyadic relationship between foreign aid and immigration revealed by this analysis represents the first empirically founded answer to the question: *When donor countries increase aid in an effort to curb bilateral immigration, does this aid serve its intended purpose?* This paper also represents one of the first attempts to theoretically address whether an increase in bilateral foreign aid might lead to an increase in bilateral
immigration, despite donors’ attempts to reduce it. More work remains to be done, however, before the effect of bilateral aid on immigration is fully understood.
2. LITERATURE REVIEW

Immigration, an enduring and conflictual issue for countries around the world, has become especially important to policymakers in developed countries in recent years (Bermeo and Leblang 2015). Concern that inflows of unskilled immigrant labor will decrease wages for citizen workers and make it more difficult for natives to find a job (Borjas 2003), along with security worries and the perception that immigrant populations threaten a country’s cultural identity, have increased in salience in many Western countries, contributing to the development of far-right (and arguably xenophobic) political parties across Europe (Lucassen and Lubbers 2012).

A recent 2016 Pew Research Center survey of individuals living in the US and in several European countries suggests that negative sentiment toward immigrants is particularly prevalent in Europe (Drake and Poushter 2016). While the results from the survey indicate that only 7 percent of Americans think increasing numbers of races, ethnicities, and nationalities makes their country a worse place to live, in Spain, which reports the lowest level of negative sentiment toward such sources of diversity in comparison to the other European countries included in the survey, 22 percent of respondents think more races, ethnicities, and nationalities makes their country a worse place to live. Meanwhile, in Italy and Greece, more than half of the respondents surveyed by Pew feel that greater diversity makes their country a worse place to live (53 percent and 63 percent respectively). Furthermore, in line with the aforementioned findings of Lucassen and Lubbers (2012), Pew found that the ideological right, including in the US (though not to the extent reported in Europe), is least likely to think greater diversity makes their country a better place. Moreover, while this survey might suggest
that Americans are particularly amenable to immigration, the results likely reflect how American respondents are influenced by the wording of that particular survey question. According to another survey by Pew, which asks US respondents about whether immigrants strengthen the US or represent a burden, 33 percent of those surveyed think immigrants represent a burden because they take “jobs, housing, and health care” away from citizens (Jones 2016, n.p.).

Thus, although there is marked variation in attitudes toward immigrants across the West, it is clear that state leaders in Europe and in the US, and likely in other developed countries as well, must contend with constituents who bear negative attitudes toward immigration, thus compelling governments to erect legal and physical barriers to stem the inflow of immigrants. However, because many strategies aimed at reducing immigration often fail to address the distributional inequalities that drive people to leave their home countries for opportunities abroad, many attempts to limit migrant inflows have mixed levels of success (Bermeo and Leblang 2015).

One of the strategies state leaders may consider, according to work by Bermeo and Leblang (2015), is to increase bilateral foreign aid to migrant sending countries. Some policymakers, working under the assumption that foreign aid can promote economic development in recipients, may view increasing the amount of foreign aid sent to a migrant sending country as a viable means for reducing immigration. Yet, whether this strategy actually is effective is unknown; however, as the following sampling of the literature will show, little evidence supports the idea that aid would have a quick or meaningful enough positive impact on economic development and the quality of life in a recipient to sufficiently reduce the demand for immigration.
Even so, this does not mean that aid has no impact. To the contrary, it is plausible, for example, that aid could promote higher rates of immigration by functioning as a signal to residents in a recipient of a donor’s greater wealth; although, discussion about this possibility is lacking in the literature.

2.1. The General Effects of Foreign Aid

Though little research on the relationship between foreign aid and migrant flows exists, there is a long line of scholarship dealing with the effects of foreign aid on recipient countries, both in terms of its impact (both ideological and material), and in terms of whether aid accomplishes the goals of donors.

For example, in 1962, Morgenthau, certainly not the first to examine the value of foreign aid as a policy tool, wrestled with the question of whether foreign aid is either “an instrument of foreign policy,” or if it is transcendent of foreign policy. The latter view, according to Morgenthau, holds that foreign aid fulfills an obligation rich countries have for poor ones, while the former view holds that foreign aid is a wasteful investment (a “gigantic boon-doggle” as Morgenthau puts it) that does nothing to serve the interests of both foreign aid donors and their recipients.

More than a decade and a half later Bornschier, Chase-Dunn, and Rubinson (1978) conducted a meta-analysis of cross-national empirical studies having to do with the effects of foreign aid/investment in aid-receiving countries. Five general conclusions were made by the authors: first, foreign aid and investment were found to result in an increase in economic inequality within aid-receiving countries; second, in the short-term, aid seemed to promote an increase in a country’s relative economic growth; third, in the
long-term, aid appeared to have a negative effect on a country’s relative economic growth; fourth, while foreign aid was associated with a decrease in the long-term economic growth of a country, the degree to which aid exerted a negative effect depended on a country’s level of development—aid’s negative effect was greater in richer countries—; fifth, the effects of foreign aid were independent of geography.

More recently, contrary to the above findings, Juselius, Moller, and Tarp (2014) found that between the 1960s and 2007 foreign aid appeared to have a positive long-term effect on the macroeconomies of 36 sub-Saharan African countries. However, work by Asongu (2015) showed that foreign aid was associated with an increase in corruption (measured via both the corruption perception index and the corruption-control index) in middle-income, French civil-law, majority Christian, and non-oil exporting landlocked countries in Africa. Moreover, outside of Africa, further research has shown that foreign aid limits the positive pressure exerted by import receiving countries on labor rights in developing, export sending countries (Lim, Mosley, and Prakash 2015). Even so, more generally foreign aid has been shown to have a positive impact on the quality of a recipient country’s political institutions (Jones and Tarp 2016); albeit, a slight positive impact that is most associated with governance aid.

Regarding how a recipient makes decisions about allocating aid money once received, Feyzioglu, Swaroop, and Zhu (1998) examined the influence of foreign aid on recipient countries’ public expenditures. They found that from 1971 to 1990 foreign aid was mostly fungible: when countries received aid for a given project, they often reduced the amount of their own recourses going to said project and reallocated them to something else. According to Swaroop and Devarajan (1998), if aid money is fungible,
and if a recipient’s own public spending is subpar, this increases the likelihood that aid falls far short of being a cost-effective investment for donors.

As for the effects of aid on regime type and economic liberalization—both factors that may influence the opportunity cost of migration—Knack (2004), seeking an answer to the question of whether aid promotes democratic transition in non-democratic recipients, found that aid had no such promotive effect. And in their study of the relationship between aid and trade liberalization, Kono and Montinola (2015) found that the effect of aid on reducing trade barriers was related to the chances an authoritarian leader had of holding onto power: the less certain an authoritarian leader was about his ability to maintain political power, the more likely said leader was to reduce tariffs when given foreign aid.

Regarding cases of coup d’etat, the effectiveness of reducing foreign aid as sanctioning a tool against a coup is, according to Masaki (2016), contingent on all donor countries complying with the international norm of political conditionality. While many countries, suggests Masaki (2016), issue aid conditionally, the US only sporadically complies with this norm. This finding has important policy implications because countries’ attempts to apply sanctions on coups are likely to be undermined if large and influential donors such as the US fail to cooperate. Furthermore, going beyond instances of coup d’état, this finding may suggest that the failure of donor countries to cooperate generally can have a potentially negative impact on a donor’s chances of accomplishing its goals (for example, promoting development and thereby reducing immigration).

Outside the material implications of foreign aid, aid money may also have an impact on a recipient’s ideology. Swindle (2015), after examining the effect of targeted
aid projects in Malawi on changes in gender dynamics, found that foreign aid had an impact on Malawian views on gender, which may suggest, in turn, that there are “ideational consequences” of foreign aid allocation, intended or otherwise. However, regarding more narrowly the impact of aid on views on gender, there are real material consequences, not just ideological ones, associated with, for example, giving women more open access to education and human capital and more opportunities to play a stronger economic and entrepreneurial role in society (Jütting and Morrisson 2005). Economic development and women’s empowerment are strongly correlated, and while it is doubtful that women’s rights and economic development mutually reinforce each other perfectly, empowering women can have some positive effects on the choices a society makes, which can have, at best, a moderately positive economic impact (Duflo 2012). However, to expect a positive effect to be immediate or substantial, especially as a result of foreign aid, is more than likely wishful thinking.

2.2. The General Determinants of Aid Allocation

There is disagreement about whether foreign aid allocations are motivated by donor policy interests or genuine altruism; however, according to Swiss (2016) neither view can sufficiently account for foreign aid’s role in a globalized world. Nevertheless, there is ample evidence that foreign aid often is allocated by donors for a variety of self-interested reasons.

Research by Alesina and Dollar (2000) has shown that aid allocations are determined by various political and strategic concerns, in addition to the needs and policies of recipients. Factors, such as whether the recipient has a colonial past with the
donor and is a member of an alliance, along with whether a recipient country is a democracy, has “good” economic policies, and offers protections for property rights, affect a donor’s determination of whether or not to send aid. Furthermore, Wiseman and Young (2015) found that when countries allocate foreign aid, they often do so out of self-interest. They discovered that citizens of donor countries receive a “warm-glow” from their “own”/“own country” donations, and thus, in an effort to compete with the donations from larger countries such as the US, small countries contribute more aid per capita.

At the same time, however, the desire to “feel good” about oneself or one’s country for aid allocated to another country can often be tempered by economic crisis in a donor. According to Heinrich, Kobayashi, and Bryant (2016), public support for foreign aid tends to decline in response to a decline in the wellbeing of a donor country’s economy. Add to this the fact that the rate of return on foreign aid expected by donors is similar to the range often considered acceptable to public investors (Arndt, Jones, and Tarp 2015) and it becomes clear that pure altruism is rarely a key determining factor in a donor’s decision to allocate aid—donors usually want something in return from aid recipients.

2.3. Determinants of Immigration

Various theories have been proposed to explain patterns of international migration. Several in particular, such as neoclassical economics, the new economics of migration, and dual labor market theory, as well as world systems theory, emphasize the individual, the household, and the overall global market as their primary level of analysis,
respectively (Massey et al. 1993). These theories generally focus on income maximization for the individual, decisions made at the household level to reduce risks and escape economic constraints, and global economic forces that either establish “structural requirements” on immigration or lead to “market penetration across national boundaries” (Massey et al. 1993). Taken together, the general gist of these theories is that migrant flows are fueled by desires for improved income and household security, and by macroeconomic factors that push individuals out of one country’s labor market and pull them into another’s.

If these factors are really the key determinants of migration, then the only truly effective way to regulate migrant flows would be to balance economic opportunities within and across borders (Taylor 2007). However, variables other than distributional inequality also determine migrant patterns. Most obviously, the distance between the migrant-sending country and the destination country factors into an individual’s determination of the costs involved in migrating (Hatton and Williamson 2003a; Hatton and Williamson 2003b). Also, the political environment of the destination country—the relative restrictiveness of citizenship laws, the presence of competitive xenophobic political parties, etc.—may influence the decision to migrate (Fitzgerald, Leblang, and Teets 2014). More restrictive immigration policies, for example, may make it more difficult for migrants to enter a country legally, while a hostile citizenry in the destination country may dissuade would-be immigrants from entering.

Social networks among friends and family members may further impact migration by providing information or financial support for immigrants (Massey et al. 1993). Such networks offer help to migrants looking for work and housing, and they make integration
into the host country’s society substantially easier (Joly 1987; Sassen 1995; Light, Bernard, and Kim 1999; Massey et al. 1999).

2.4. The Effects of, and Backlash Associated with, Immigration

Though some evidence suggests that immigration may have at best a positive net effect on the immigrant receiving country’s economy, there remain concerns within industrialized countries about immigration’s potentially negative consequences for low-skill native workers (Bermeo and Leblang 2015). Yet, even though some studies have found a significant and negative correlation between migrant inflows and wages for native workers (especially those who lack a high school degree), recent research by Ottaviano and Peri (2012) provides evidence that migrant inflows into the US have had a small, though positive, effect on wages for native workers without a high school degree, as well as a positive effect on overall native wages, while migrant inflows have had a negative effect on the wages of previous immigrants.

However, despite the lack of strong evidence that immigration has a pronounced negative impact on a destination country’s economy, a lack of support for freer immigration policies tends to be prevalent among those most exposed to immigrant fiscal pressures: native taxpayers who perceive immigrants as a costly burden (Hanson, Scheve, and Slaughter 2007). Furthermore, as previously discussed, negative attitudes toward immigration remain salient in many European countries and (to a lesser extent) in the US, and there recently has been a rise in the popularity and competitiveness of radical rightwing parties in response to the arrival of foreign workers (Lucassen and Lubbers 2012), putting greater pressure on politicians to implement tougher restrictions on
immigration (Bermeo and Leblang 2015).

2.5. Foreign Aid as a Strategy for Curbing Immigration

Although restrictive immigration policies can reduce the flow of immigrant workers, because such barriers fail to balance the cross-border inequalities that motivate immigration, they fall far short of halting the flow of migrant labor altogether (Bermeo and Leblang 2015).

As already mentioned, some policymakers presume foreign aid can serve as an additional tool for reducing migrant inflows by promoting economic development in migrant-sending countries, thereby reducing the demand to immigrate to the donor. However, as the literature on the effects of foreign aid suggests, there is inconclusive evidence that that foreign aid is an effective development tool, at least in the short-term. Nevertheless, there is some anecdotal evidence that policymakers use aid strategically to curb immigration (Bermeo and Leblang 2015). For instance, in 2008 the French foreign aid agency partnered with the French Ministry of Immigration, Integration, National Identity, and Inclusive Development to implement a strategy to give “support for the development of migrants’ home countries or regions to ensure that migration does not become the only way for local populations to survive or live decently” (qtd. in Bermeo and Leblang 2015, 631). Furthermore, Bermeo and Leblang (2015) provide compelling empirical evidence that bilateral aid commitments are positively tied to changes in the size of migrant populations from recipient countries residing in a donor, suggesting that policymakers do indeed increase foreign aid in response to an increase in immigration as a part of a strategy to reduce migrant inflows.
Several scholars, however, are skeptical that aid is likely an effective means for reducing the demand to immigrate. Faini and Venturini (1993) speculate that the relationship between income and immigration may take the form of an inverted U-curve. They suggest that improvements in income may lead to an increase in migration among low wage foreign workers and to a decrease in migration among higher wage earning foreign workers. Meanwhile, others, such as de Haas (2007), think that aid is highly unlikely to decrease migrant inflows altogether, and Bermeo and Leblang (2015) suggest that, at the very least, aid is unlikely to have an effect in the short-term. However, contrary to the skeptics, Hatzipanayotou and Michael (2012) hypothesize that increases in foreign aid sent to a recipient ought to reduce the demand for immigration, provided the recipient increases its co-financing rate; yet, their model remains theoretical at this point. So, while there is no want for speculation on whether aid has an impact on immigration, there is a surprising lack of systematic empirical analysis that can allow one to conclude whether aid is or is not an effective tool for reducing immigration. Even more, the question of whether aid might potentially lead to an *increase* in immigration remains, to this author's knowledge, completely unaddressed.
3. THEORY AND HYPOTHESES

From the foregoing discussion, a few main points can be surmised. First, while it is possible that donors send foreign aid to recipient countries for altruistic reasons, there is ample evidence that aid is given for a number of self-interested reasons as well. Also, it may be that a desire to reduce immigration is one among many of these self-interested reasons for sending foreign aid. State leaders may assume that aid can help to promote economic development in recipients and that the (supposed) improvement in the recipient’s economy, in turn, may increase the opportunity cost associated with migrating.

Second, there are a number of factors associated with migrant flows, but one of the most important is the balance (or imbalance) of resources within and across borders. Greater economic wealth, more opportunities for employment, the promise of better standards of living, and greater security in one country relative to another motivate migration.

It is unclear, however, whether or how foreign aid might affect the balance of resources between donor and recipient, or the perception thereof, and thus influence a given individual’s decision to migrate. While there is little evidence that aid really does promote economic development in recipients—at least in a timely enough fashion to reduce migrant inflows in a meaningful way—none have systematically examined whether, how, or in what direction aid influences immigration.

3.1. Does Foreign Aid Influence the (Perceived) Balance of Resources across Borders?

While the absolute and relative balance of resources between any two countries certainly
influences the decision to migrate, this balance would have no meaningful impact if it was not perceived. But, since no individual can see directly what the balance of resources is between this and that country, an individual must rely on certain signals to inform her of the balance of resources between her home country and her potential destination. The question here is, does foreign aid function as one such signal of wealth? And, if so, does an increase in foreign aid sent to a recipient make a donor appear like a more appealing destination, even when controlling for the actual wealth of the donor? Provided residents of an aid recipient are aware that aid is being allocated to their country from a donor, it seems plausible that this aid could give residents in a recipient the impression that a donor has greater wealth.

Of course, assuming it is true that foreign aid influences the perceived balance of resources between donor and recipient, there is still the further question of how individuals in a recipient might be made aware of changes in foreign aid sent to their country from a donor. Gaging perception on a large scale is obviously problematic, but there are a few likely mechanisms by which perception might be facilitated. Information made available by state leaders and national news outlets is one likely source, while another possible avenue through which such information could be obtained is migrant social networks. As discussed in the literature review, migrants already residing in a donor can provide relatives living back in their home country with more than just financial resources, help looking for employment and housing in the destination country, and assistance in making the transition to life in a new society, but also information about the wealth of a donor and the prospects for a better life there (Joly 1987; Massey et al. 1993; Sassen 1995; Light, Bernard, and Kim 1999; Massey et al. 1999). It is,
therefore, hardly a stretch to suppose that such transnational migrant social networks also
could provide information about the amount of aid sent from a donor to a recipient—in
fact, there is even evidence that migrants lobby host states to send more aid to their
respective countries of origin (Bermeo and Leblang 2015).

3.2. Aid and Immigration: A Positive Relationship?
Assuming aid is one among many potential signals to residents in a recipient of the
relative wealth and appeal of a donor, evidence of a positive relationship between aid and
immigration ought to exist. Thus, the results of an analysis of the effect of aid from
donor countries to recipients on migrant inflows from recipients to donors should support
the following hypothesis:

H1: An increase in aid sent from a donor to a recipient should result in an
increase in migration from the recipient to the donor, ceteris paribus.

Also, because the ability of aid to influence the decision to migrate may depend
on the ability of residents in aid recipients to be made aware of a donor’s decision to
increase or decrease aid, the interaction of aid with factors such as whether a donor and
recipient share a common language, whether they share a colonial past, and whether the
recipient is a democracy may have a significant impact on migration. While these factors
may not perfectly measure whether recipients have a greater perception of foreign aid
being allocated to their country, the possibility that such factors may promote greater
awareness is at the very least conceivable. A common language between donor and
recipient, for example, may make it easier for residents in recipient countries to be made aware of changes in aid sent from a donor, and a shared colonial past may indicate the presence of historical ties between donor and recipient. Meanwhile, democratic recipients may have more open access to information from relatives and other social connections abroad, as well as to transparent news and other media in their own country and from donor countries, promoting greater awareness of aid allocated to their country from a donor. Thus, I further test the following hypotheses:

**H2:** The interaction of aid with whether a donor and recipient share a common language should have a positive effect on migrant inflows, ceteris paribus.

**H3:** The interaction of aid with whether a donor and recipient share a colonial past should have a positive effect on migrant inflows, ceteris paribus.

**H4:** The interaction of aid with whether a recipient is a democracy should have a positive effect on migrant inflows, ceteris paribus.

### 3.3. How Strong is the Pull of Bilateral Foreign Aid?

Fitzgerald, Leblang, and Teets (2014), in their analysis of the effects of political conditions in migrant-receiving countries on bilateral migrant inflows, found that greater levels of pro-immigration rights in migrant receivers had a positive impact on migrant
inflows and that this positive effect was able to overcome "gravity": that is, the effects of traditional material concerns such as economic interest and bilateral distance that factor into the opportunity cost of migration were "defied" by the pull of friendlier political rights in migrant-receiving countries.

Provided evidence that foreign aid has a positive effect on bilateral migrant inflows is found, it further would be useful to assess just how powerful its effect is. Other researchers have described their models of bilateral migrant flows as "gravity-type" equations that, in essence, measure the push-pull forces that influence immigration (Fitzgerald, Leblang, and Teets 2014; Mayda 2010; Ortega and Peri 2009; Gogger and Hansen 2008; Clark, Hatton, and Williamson 2007). One way to estimate the strength of aid’s bilateral "gravitational pull" on migrant inflows is to estimate a model where bilateral aid is interacted with bilateral distance and one where it is interacted with donor migration policy restrictiveness. Once estimated, the marginal effects of aid can be calculated for each model and plotted against bilateral distance and migration policy restrictiveness, allowing inference of the relative strength of foreign aid’s bilateral gravitational pull. So, contingent on whether the following analysis rejects the null for the first hypothesis, I ask the following research questions:

R₁: If the effect of aid on migrant inflows is positive and statistically significant, how strong is aid’s pull on migrant inflows relative to the bilateral distance?
Ri: If the effect of aid on migrant inflows is positive and statistically significant, how strong is aid’s pull on migrant inflows relative to the restrictiveness of a donor’s immigration policy?
4. DATA AND METHODS

4.1. The Model

To model the effect of bilateral foreign aid on migrant inflows, I develop the following model of donor-recipient relations, and, following Fitzgerald, Leblang, and Teets (2014), I utilize ordinary least squares (OLS):

\[
\log(\text{rInflow}_{d,t}) = \alpha + \beta_1 \log(\text{dAid}_{d,t-1}) + \beta_2 \text{dRestrict}_{d,t-1} + \beta_3 \text{rConflict}_{d,t-1} \\
+ \beta_4 \log(\text{drDistance}_d) + \beta_5 \text{drColony}_d + \beta_6 \text{drLanguage}_d + \beta_7 \text{rDemocracy}_{d,t-1} \\
+ \beta_8 \log(\text{dGDPcap}_{d,t-1}) + \beta_9 \text{dUnemployment}_{d,t-1} + \beta_{10} \log(\text{dPopulation}_{d,t-1}) \\
+ \beta_{11} \log(\text{rInflow}_{d,t-1}) + dFE_d + ryFE_d + \varepsilon_{d,t}.
\]

I additionally estimate models where \( \log(\text{dAid}_{d,t-1}) \) is interacted with \( \text{drColony}_d \), \( \text{drLanguage}_d \), and \( \text{rDemocracy}_{d,t-1} \) to further test hypotheses 2 through 4, and I also estimate models where \( \log(\text{dAid}_{d,t-1}) \) is interacted with \( \log(\text{drDistance}_d) \) and \( \text{dRestrict}_{d,t-1} \) to offer answers to research questions 1 and 2. Also, because the dependent variable displays left censoring at 0 (migrant inflows are a non-negative continuous variable), utilizing OLS may yield biased estimates. Thus, as a check against bias I also utilize Tobit estimation, where it is assumed there is a latent dependent variable (\( y^* \)) where \( y^* = \) the observed value of \( y \) if \( y^* > 0 \), but not otherwise (see Tobin 1958 and Amemiya 1973).

4.2. Unit of Analysis

The unit of analysis is dyad-years, where each dyad (d) captures the relationship between of one of 18 donor countries, all of which are members of the Organization for Economic
Co-operation and Development (OECD), and one of 130 aid recipients. Donor-recipient relations are analyzed from 1994 to 2011 (t). The donors included in the analysis are Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States. For each of these countries, variables for dyadic migrant inflows and foreign aid commitments vary substantially across time and across cases. Due to inconsistencies in donor reporting, in some instances the available data are incomplete.

4.3. Operationalization of the Dependent Variable: Migrant Inflows

The dependent variable, migrant inflows \( \log(r_{Inflow_{d,t}}) \), is operationalized as the natural log of (one plus) bilateral migrant inflows in thousands from aid recipients to donors. Data on migrant inflows is drawn from the International Migration Database found at OECD.stat, a data site run by the OECD. Migration flows are measured by the OECD using population registers, residence and/or work permits, and specific surveys.

4.4. Operationalization of the Independent Variable of Interest: Aid Commitments

Foreign aid \( \log(d_{Aid_{d,t-1}}) \) is operationalized as the natural log of (plus one) bilateral aid commitments in millions of constant (2014) dollars from donors to recipients. Aid commitments are lagged by 1 year in order to account for endogeneity. Data for aid commitments is drawn from OECD data (dataset DAC3a), which can be found at OECD.stat. According to the OECD,

A commitment is a firm written obligation by a government or official agency, backed by the appropriation or availability of the necessary funds, to provide resources of a specified amount under specified financial terms
4.5. Operationalization of Control Variables

The factors that motivate migration are many and complex, several of which have been identified in the migration literature as having significant influence on migrant flows. To control for their effect, a number of these factors are included in the analysis, and, to account for endogeneity, each is lagged by one year.

4.5.1. Restrictiveness of a Donor’s Migration Policy. When countries pass more restrictive immigration policies, they often do so in an effort to curb immigration. Such efforts, while also being potentially effective, may also signal hostility toward new migrants. Thus, more restrictive immigration policies \( d_{\text{Restrict}, t-1} \) should be associated with a decline in migrant inflows. To capture the restrictiveness of a country’s migration policy, I use the International Migration Institute’s DEMIG Policy dataset, which assesses for every piece of immigration-related legislation passed in each donor country over the period included in this analysis whether the legislation is intended to reduce restrictions on immigration, result in no change in restrictions on immigration, or increase restrictions on immigration. I measure the net change in restrictiveness of a donor’s migration policy per year as 1 if in a given year the sum of the number of restrictive migration policies (individually scored as 1) plus the number of unrestrictive policies (individually scored as -1) plus the number of policies that have no effect on migration policy restriction (individually scored as 0) is greater than 0. The net restrictiveness for a given year is measured as -1 if the sum of the number of unrestrictive policies (-1) plus
the number of restrictive policies (1) plus the number of restriction-neutral policies (0) is less than 0. Finally, I measure the net change in the migration policy of a country for a given year as 0 if the sum of the number of restrictive policies (1) plus the number of unrestricted policies (-1) plus the number of restriction-neutral policies (0) equals 0. The relative migration policy restrictiveness per year is then estimated relative to the previous year beginning with 1993 and adjusted so that the lowest restrictive migration policy score per donor equals 0. For example, if a donor’s level of migration policy restrictiveness is estimated, based on the methodology outlined above, as 1 in 1993, 0 in 1994, 1 in 1995, and 1 in 1996, these scores would then be recoded as 1, 1, 2, and 3 respectively so that the scores are relative to the baseline set in 1993. Then these scores would be adjusted downward by -1 since the lowest estimated score was 1 so that the final estimated scores are 0, 0, 1, and 2.

4.5.2. Severity of Civil Conflict in the Aid Recipient. Using the “Major Episodes of Political Violence, 1946-2014” dataset compiled by the Center for Systemic Peace, I take the total summed magnitude of all societal episodes of political violence (which includes the severity of incidents of civil violence, civil war, ethnic violence, and ethnic war) in each aid recipient per year ($r_{Conflict_{d,t-1}}$). The severity of civil conflict is measured on a scale from 0 to 10, where 0 equals no civil conflict and 10 equals the most severe level of civil conflict.

4.5.3. Distance between Donor and Recipient. The distance between donor and recipient ($\log(drDistance_{d})$) is measured as the natural log of the bilateral distance in kilometers
between both countries' largest cities where the intercity distance is estimated using a gravity equation that weights the intercity distance based on the proportion of each country's population living in each city (for more details see Mayor and Zignago 2011). Data is drawn from the dist_cepii dataset, found under the GeoDist page at CEPII's website.

4.5.4. Colonial Ties. To control for the possibility that a donor and a recipient have ever had a previous colonial tie, I use a dummy variable \( drColony_d \) that equals 1 if a donor and recipient share a colonial past and 0 if otherwise. Data is drawn from the dist_cepii dataset.

4.5.5. Common Language between Donor and Recipient. Because language can often be a barrier to integration in a new country, if a donor and recipient share a common language, this ought to reduce the opportunity cost of migrating to a donor. So, using data drawn from the dist_cepii dataset, I use a dummy variable \( drLanguage_d \) that equals 1 if a donor and recipient share a common language and 0 if otherwise.

4.5.6. Regime of the Aid Recipient. If the aid recipient has a polity 2 score of 6 or greater according to the "Polity IV Annual Time Series, 1800-2014" compiled by Polity IV, I code 1, indicating that the country is a democracy, and 0 if otherwise for a dummy variable \( rDemocracy_{d,t-1} \)

4.5.7. Wealth of the Donor. The wealthier the donor country, the more appealing it looks
to residents in aid recipient countries. Thus, to control for the wealth of a donor I use the natural log of the real gross domestic product per capita in constant (2005) US dollars per donor \((\log(d\text{GDPcap}_{d,t-1}))\). Data for gross domestic product for each donor from 1993 to 2011 is drawn from the Penn World Table, version 8.1.

4.5.8. Employment Opportunities in the Donor. Because the unemployment rate in a donor country may indicate to would-be migrants what the likelihood is of not being able to find work in a donor (Fitzgerald, Leblang, and Teets 2014), I control for the effect of the unemployment rate in a donor country \((d\text{Unemployment}_{d,t-1})\) using the modeled ILO (International Labor Organization) estimate of a donor’s unemployment rate (i.e., the proportion of the labor force without employment but is currently able to work or looking for employment) made available by the World Bank at World DataBank.

4.5.9. Population of the Donor. Previous research has shown that countries with larger populations experience lower inflows of migrants (Fitzgerald, Leblang, and Teets 2014). Thus, to control for a donor’s population I take the natural log of the population (in millions) for each donor for each year included in the analysis \((\log(d\text{Population}_{d,t-1}))\). Data is drawn from the Penn World Table, version 8.1.

4.5.10. Inflow of Migrants the Previous Year. It is highly likely that migrant inflows the previous year are correlated with inflows the following year. To control for this, as well as to offer a check against autocorrelation, I take the natural log of (one plus) the bilateral inflow of migrants in thousands per dyad and lag it by one year \((\log(r\text{Inflow})_{d,t-1})\).
4.5.11. Donor and Recipient*Year Fixed Effects. Following the methodology of Fitzgerald, Leblang, and Teets (2014), I control for the fixed effects of “time-invariant features” of donor countries that may influence migrant flows \((dFE_d)\) and time-varying fixed effects associated with aid recipients \((ryFE_d)\) that generate “emigration pressures” on residents living in a recipient. The first set of fixed effects is a matrix of donor dummy variables, and the second is a matrix of recipient*year dummy variables.
5. RESULTS

5.1. Results from Main Model

After dropping cases with missing values, the model proposed in the previous section was estimated for a total of 19,081 dyad-years. A list of donors and recipients, along with summary statistics, can be found in the appendix.

The model performed remarkably well, with a statistically significant F and an adjusted $R^2$ of 0.93. The results support the hypothesis that bilateral aid commitments have a significant positive impact on migrant inflows, *ceteris paribus*. Additionally, the results show that a shared colonial past and a common language, previous migrant inflows, greater GDP per capita in a donor, more severe civil conflict in a recipient, and,

<table>
<thead>
<tr>
<th>TABLE 1. OLS MODEL RESULTS</th>
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</thead>
<tbody>
<tr>
<td><strong>Bilateral Characteristics</strong></td>
</tr>
<tr>
<td>Aid Commitments</td>
</tr>
<tr>
<td>Distance</td>
</tr>
<tr>
<td>Colonial Past</td>
</tr>
<tr>
<td>Common Language</td>
</tr>
<tr>
<td>Previous Migrant Inflows</td>
</tr>
<tr>
<td><strong>Donor Characteristics</strong></td>
</tr>
<tr>
<td>Migration Policy Restrictiveness</td>
</tr>
<tr>
<td>GDP/capita</td>
</tr>
<tr>
<td>Unemployment Rate</td>
</tr>
<tr>
<td>Population</td>
</tr>
<tr>
<td><strong>Recipient Characteristics</strong></td>
</tr>
<tr>
<td>Severity of Civil Conflict</td>
</tr>
<tr>
<td>Democracy</td>
</tr>
<tr>
<td><strong>Model Summary</strong></td>
</tr>
<tr>
<td>Dyad-Years</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
</tr>
</tbody>
</table>

*Notes: Cell entries are OLS coefficients. Robust standard errors are clustered by dyad using the method outlined by Stock and Watson (2008) and shown (in parentheses). Intercept and fixed effects not shown. *p < 0.05.
unexpectedly, an increase in the unemployment rate in a donor had a significant and positive association with migrant inflows. Meanwhile, as expected, greater bilateral distance, more restrictive immigration policies, and a larger donor population had a significant and negative impact on migrant inflows. The effect of a democratic regime in a recipient was positive though it failed to reach statistical significance.

5.2. Accounting for Left Censoring

As Figure 1 shows, the dependent variable’s (migrant inflows) distribution displays left censoring at 0 per several donors, which may bias estimates of the slope and intercept when using OLS. The plotted residuals, fitted values, and actual values in Figure 2 offer
further confirmation of left censoring. In order to account for this, I utilize Tobit estimation; however, due to subscripting errors, a Tobit model that includes recipient time-variant fixed effects could not be computed. To work around this computational error, I replaced this set of fixed effects with a set of time-invariant recipient fixed effects and year fixed effects.

In line with the results from OLS, Tobit regression also yields support for the hypothesis that aid commitments have a positive impact on migrant inflows. The only
TABLE 2.
TOBIT MODEL RESULTS

<table>
<thead>
<tr>
<th>Bilateral Characteristics</th>
<th>Model Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments</td>
<td>0.04 (0.01)*</td>
</tr>
<tr>
<td>Distance</td>
<td>-0.22 (0.02)*</td>
</tr>
<tr>
<td>Colonial Past</td>
<td>0.23 (0.03)*</td>
</tr>
<tr>
<td>Common Language</td>
<td>0.18 (0.02)*</td>
</tr>
<tr>
<td>Previous Migrant Inflows</td>
<td>0.83 (0.004)*</td>
</tr>
<tr>
<td><strong>Donor Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Migration Policy Restrictiveness</td>
<td>-0.01 (0.004)*</td>
</tr>
<tr>
<td>GDP/capita</td>
<td>0.9 (0.28)*</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>0.01 (0.004)*</td>
</tr>
<tr>
<td>Population</td>
<td>-1.81 (0.32)*</td>
</tr>
<tr>
<td><strong>Recipient Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Severity of Civil Conflict</td>
<td>0.01 (0.006)*</td>
</tr>
<tr>
<td>Democracy</td>
<td>-0.05 (0.02)*</td>
</tr>
<tr>
<td><strong>Model Summary</strong></td>
<td></td>
</tr>
<tr>
<td>Dyad-Years</td>
<td>19,081</td>
</tr>
<tr>
<td>Log-Likelihood</td>
<td>-20,507.85</td>
</tr>
</tbody>
</table>

**Notes:** Cell entries are Tobit coefficients. Classic standard errors are (in parentheses). Intercepts and fixed effects not shown. Due to subscripting errors, estimation with time-variant fixed effects of recipients could not be computed, so this set of fixed effects was replaced with a set of time-invariant fixed effects per recipient and a set of year fixed effects. See Figure A in the Appendix.

* p < 0.05.

The major difference between the OLS and Tobit estimates is that the direction of the effect of a recipient’s regime flipped and is now statistically significant: a recipient being a democracy has a significant, negative impact on migrant inflows.

Figure 3 displays a more intuitive graphical representation of the estimated coefficients. Comparison of the coefficient plots for the OLS and Tobit models shows some similarities as well as a number of differences. Each point represents the estimated coefficient per covariate, and the bars on either side represent the standard errors. If the standard error crosses the 0 axis, the result fails to reach statistical significance.
5.3. Testing Hypotheses 2 through 4

Further analysis fails to find robust support for the hypotheses that the interaction of bilateral aid commitments with a shared colonial past, a common language, and democratic regime in a recipient have a positive impact on migrant inflows. As the results displayed in Table 3 show, none of the interaction effects have a statistically significant impact.

The results for three Tobit models also fail to offer support for these three hypotheses. In each of the models, the interaction term fails to reject the null. Again, unlike in the OLS models, the effect of a democratic regime in a recipient is negative and statistically significant. Also, as with the previous Tobit model, time-variant recipient
fixed effects could not be computed due to subscripting errors, so recipient time-invariant fixed effects and year fixed effects were included in model estimation instead.

A comparison of the Tobit and OLS estimates can be seen in Figure 4. Again, the results display a number of similarities, but also a number of differences. In each, however, it is clear that the interaction effects fall far short of statistical significance.

### Table 3.
**OLS Model Results**

<table>
<thead>
<tr>
<th>Interaction Effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments*Colonial Past</td>
<td>-0.03 (0.02)</td>
</tr>
<tr>
<td>Aid Commitments*Common Language</td>
<td>0.002 (0.01)</td>
</tr>
<tr>
<td>Aid Commitments*Democracy</td>
<td>0.003 (0.01)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Summary</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad-Years</td>
<td>19,081</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.93</td>
</tr>
</tbody>
</table>

*Notes:* Cell entries are OLS coefficients. Robust standard errors are clustered by dyad (see Stock and Watson 2008) and shown (in parentheses). Only interaction effects shown.

*p* < 0.05.

### Table 4.
**Tobit Model Results**

<table>
<thead>
<tr>
<th>Interaction Effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments*Colonial Past</td>
<td>-0.03 (0.02)</td>
</tr>
<tr>
<td>Aid Commitments*Common Language</td>
<td>-0.001 (0.01)</td>
</tr>
<tr>
<td>Aid Commitments*Democracy</td>
<td>0.002 (0.01)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Summary</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad-Years</td>
<td>19,081</td>
</tr>
<tr>
<td>Log-Likelihood</td>
<td>-20,507.81</td>
</tr>
</tbody>
</table>

*Notes:* Cell entries are Tobit coefficients. Classic standard errors are (in parentheses). Intercepts and fixed effects not shown. Due to subscripting errors, estimation with time-variant fixed effects of recipients could not be computed, so this set of fixed effects was replaced with a set of time-invariant fixed effects per recipient and a set of year fixed effects. Only interaction effects shown.

*p* < 0.05.
5.4. Can the Pull of Aid Commitments “Defy Gravity?”

As outlined in the data and methods section, to answer research questions 1 and 2, I interact bilateral aid commitments with bilateral distance and with the restrictiveness of donor migration policy to assess whether the effect of a one unit increase in aid, contingent on an increase in bilateral distance and contingent on an increase in donor migration policy restrictiveness, is positive and statistically significant.

The results, however, show that despite the positive impact of aid on migrant inflows, the interaction of aid with bilateral distance and with donor migration policy restrictiveness fail to reject the null hypothesis (Table 5 and Figure 5). The marginal effect of bilateral distance and of migration policy restrictiveness are plotted in Figure 6.
### TABLE 5.
OLS AND TOBIT MODEL RESULTS

<table>
<thead>
<tr>
<th>Interaction Effects</th>
<th>OLS Estimates</th>
<th>Tobit Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments*Distance</td>
<td>-0.002</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Aid Commitments*Migration Policy</td>
<td>-0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Restrictiveness</td>
<td>(0.001)</td>
<td>(0.002)</td>
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<tr>
<td><strong>Model Summary</strong></td>
<td></td>
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</tr>
<tr>
<td>Dyad-Years</td>
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<td>19,081</td>
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<tr>
<td>Adjusted $R^2$</td>
<td>0.93</td>
<td>0.93</td>
</tr>
<tr>
<td>Log-Likelihood</td>
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<td>-20,507.79</td>
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**Notes:** Cell entries are OLS and Tobit coefficients. Robust standard errors are clustered by dyad (See Stock and Watson 2008) and shown (in parentheses) for OLS estimates. Classic standard errors are shown (in parentheses) for Tobit estimates. Only interaction effects shown. Due to subscripting errors, Tobit estimation with time-variant fixed effects of recipients could not be computed, so this set of fixed effects was replaced with a set of time-invariant fixed effects per recipient and a set of year fixed effects.

*p < 0.05.

---

**FIGURE 5.**
OLS AND TOBIT COEFFICIENT PLOTS (SEE TABLE 5)
These results suggest, to borrow from Fitzgerald, Leblang, and Teets (2014, 425), that bilateral foreign aid does not play a powerful “role in compensating for the transaction costs associated with migrating.” Put differently, while an increase in bilateral foreign aid may lead to more bilateral migrant inflows, ceteris paribus, bilateral distance and more restrictive immigration policies remain important deterrents of migration even as bilateral foreign aid increases. In fact, as bilateral aid increases, in a striking twist, the effects of greater bilateral distance and of more restrictive donor migration policies become even more negative; although, it should be noted that the 95% confidence intervals display a great deal of variance.

However, while the interactions of foreign aid with bilateral distance and with donor migration policy restrictiveness are not statistically significant, as the plotted marginal effect of bilateral aid in Figure 7 shows, the positive impact of aid seems to decrease as both bilateral distance and donor migration policy restrictiveness increase. In other words, the gravitational pull of bilateral aid, through remaining positive, loses some of its strength with greater bilateral distance and more restrictive donor immigration policies (the 95% confidence intervals display a high degree of variance, however).

Taken together with the effect of aid on the marginal effects of bilateral distance and donor migration policy restrictiveness, these results suggest that while bilateral foreign aid does significantly affect bilateral push-pull forces, greater bilateral distance and more restrictive donor immigration policies slightly diminish the effect of bilateral aid on bilateral migrant inflows, while an increase in bilateral aid seems to be associated with an increase in the strength of the negative marginal effects of both bilateral distance and donor immigration policy restrictiveness. The strength of aid’s positive pull, it
seems, is not enough to reduce the limitations imposed by distance and restrictive immigration policies. In fact, as aid increases, its positive impact may diminish.

**Figure 6.**
**OLS Marginal Effects of Bilateral Distance and Donor Migration Policy**

**Figure 7.**
**OLS Marginal Effect of Bilateral Foreign Aid**
5.5. Why the Diminishing Positive Impact of Foreign Aid?

5.5.1. An Upper Threshold for Migrant Inflows. There are multiple ways to interpret this finding, but perhaps one of the more parsimonious is that yearly bilateral migrant inflows simply cannot increase *ad infinitum*. At some point, perhaps at a point unique to each dyadic relationship between countries, there is an upper threshold for bilateral migrant inflows that, when approached, leads to a gradual slowing and leveling off (or even reversal) of the effect of aid on migrant inflows, thereby leading to an increase in bilateral distance and donor migration policy restrictiveness’s negative marginal effects. Figure 8 shows the smoothed curve with 95% confidence intervals for the plotted relationship between bilateral aid commitments at year t-1 and bilateral migrant inflows at year t for

![Figure 8. The Plotted Effect of Bilateral Aid on Migrant Inflows by Donor](image-url)
each donor included in the analysis. While in some instances the relationship appears fairly linear, in others the relationship either takes the form of an inverted "U" or "J" or it fluctuates in a way that resembles a sine wave.

However, when the relationship between bilateral aid commitments and migrant inflows is plotted by year rather than by donor, the results look substantially smoother (Figure 9). Furthermore, when the relationship is plotted by both donor and year, the results look cleaner still (Figure 10). Even so, there are yet examples where the relationship between bilateral aid and migrant inflows is not perfectly linear. It may be that in these cases, bilateral migrant inflows simply have hit their upper limit. That is, as bilateral aid increases, its positive effect eventually diminishes as the number of actual

![Figure 9. The Plotted Effect of Bilateral Aid on Migrant Inflows by Year](image-url)
**Figure 10.**

The plotted effect of bilateral aid on migrant inflows by donor and year.
migrants increases relative to the pool of potential migrants in a recipient, at which point other “gravitational forces” that have a negative effect on immigration may experience an increase in their marginal effects.

This explanation, though merely speculative, does have some empirical support when I assume in my model that bilateral aid has a quadratic relationship with migrant inflows. Table 6 displays the OLS and Tobit coefficients for such a model. In each, the coefficient for bilateral aid commitments is positive and statistically significant while the squared value for bilateral aid commitments is statistically significant and negative, suggesting that as bilateral aid commitments increase the slope of their effect is at first positive but eventually curves downward (see Figures 11 and 12), supporting the above speculation that the positive effect of bilateral aid on migrant inflows eventually yields diminishing returns. Further indication that a quadratic relationship may better explain the relationship between aid and migrant inflows is that the log-likelihood for the Tobit

<table>
<thead>
<tr>
<th>Table 6. OLS AND TOBIT MODEL RESULTS</th>
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<tr>
<td><strong>Quadratic Effects</strong></td>
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<tr>
<td>Aid Commitments</td>
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<tr>
<td>Aid Commitments^2</td>
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<td><strong>Model Summary</strong></td>
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<tr>
<td>Dyad-Years</td>
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<td>Adjusted R^2</td>
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<td>Log-Likelihood</td>
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</table>

Notes: Cell entries are OLS and Tobit coefficients. Robust standard errors are clustered by dyad (See Stock and Watson 2008) and shown (in parentheses) for OLS estimates. Classic standard errors are shown (in parentheses) for Tobit estimates. Only bilateral aid effects shown. Due to subscripting errors, Tobit estimation with time-variant fixed effects of recipients could not be computed, so this set of fixed effects was replaced with a set of time-invariant fixed effects per recipient and a set of year fixed effects.

*p < 0.05.
model suggests a comparatively better fit, though slight, compared to the Tobit models estimated previously. The comparative performance of the OLS model compared to those previously estimated, however, is much less substantial.

5.5.2. More Aid for More Efficient Investments. While the above explanation seems plausible enough, there are still two other rather parsimonious explanations for why the effect of foreign aid on bilateral migrant inflows is curvilinear: 1) perhaps it takes a great deal of bilateral aid to effectively and meaningfully improve conditions in a recipient to sufficiently counter the positive signaling aid would otherwise have on would-be migrants' determination of the cost-benefit ratio associated with moving to the donor; or,
2) maybe donors, desiring a sensible return on investment, are more likely to allocate greater amounts of aid to recipients who would make better use of that aid, and that aid’s better use, which translates into better economic and quality of life outcomes, thereby reduces the demand to emigrate.

These explanations are not necessarily mutually exclusive, but there is reason to think the latter view may be the better explanation of the two. The notion that if countries simply throw enough money at recipients the demand for bilateral migration will go away seems, at its face, naïve. It seems more likely (and more in line with previous research) that donors choose to allocate greater amounts of aid when they have
more confidence that recipients will use that aid more effectively. As briefly discussed in the literature review, there is evidence that when donors make decisions about allocating aid they take into consideration features of the recipient country that indicate to the donor whether aid will yield a good (however defined) return on investment. If certain countries appear to donors as more “worthy” recipients, donors further may feel safer allocating more aid to these countries under the assumption that that investment is a safer bet. In turn, assuming donors have made an accurate appraisal of these more worthy recipients, these countries may put the foreign aid they receive to better use, leading to economic improvements, more jobs, better standards of living, etc.

More effective use of bilateral aid on the part of these recipients may additionally explain why increased bilateral aid is associated with stronger bilateral distance and donor migration policy restrictiveness marginal effects. When considering the costs and benefits of staying in their home country versus moving to a given donor, would-be migrants living in a country where government officials put foreign aid to better use may place greater weight on the costs associated with moving to a donor, and they conversely may place less weight on the positive signals of donor wealth created by greater bilateral aid, because that aid results in more tangible benefits for residents in recipients. In such countries, an increase in bilateral aid might make staying rather than leaving seem like the more appealing option.

The flip side of this scenario, of course, is that in cases where an overall lesser amount of aid is allocated to a recipient that fails to effectively use that aid, an increase in bilateral foreign aid may lead to an increase in bilateral migrant inflows because, in such a case, the positive signals of greater donor wealth relative to a recipient may seem to
outweigh the positive benefits that that aid could yield in a recipient in the minds of would-be migrants.

Nevertheless, regardless of why aid might have a positive, though curvilinear, relationship with bilateral immigration, the empirical evidence provided by this analysis stands; however, future research will need to consider these results in greater detail and address the plausibility of the explanations offered.
6. BILATERAL AID AND IMMIGRATION: TAKING A CLOSER LOOK

While large $N$ quantitative analyses can reveal a statistically significant relationship between two or more variables, individual cases can often defy larger trends. Taking a narrower look at the dyadic relationship between donors and recipients can allow for a more nuanced understanding of the role bilateral aid commitments may play in motivating international migrant flows that the previous large $N$ analysis may have missed.

To see how well the results from the models estimated in the preceding section hold up under the microscope, I examine and compare the dyadic relationships between two OECD donor countries and three aid recipients of each. The donors I selected are France and Great Britain. Both donors are former colonial powers, both are geographically proximate, and both have comparable per capita GDP. For each country, I selected three aid recipients based on their geographical proximity to one another and whether each of the cases had available data for enough years to allow for a meaningful longitudinal analysis. I also attempted to control for historical bilateral donor-recipient relationships by selecting cases that were prior colonies of each donor. Using these criteria I selected the following aid recipients:

- For France, the North African countries of Algeria, Morocco, and Tunisia;
- For Britain, the South Asian countries of India, Pakistan, and Sri Lanka.

For each donor and its three recipients I examine the bilateral impact of foreign aid at year $t-1$ on bilateral migrant inflows at year $t$ and observe whether the hypothesis that greater bilateral aid should be associated with greater bilateral migrant inflows ($H_1$) holds true for the selected cases. In doing so, I try to control for other relevant factors.
that may influence immigration, such as per capita GDP in the donor and donor migration policy restrictiveness.

In order to test H1 for such a small subset of data, I first compare the observed level of bilateral immigration per dyad (as bilateral aid varies) to the predicted level of bilateral immigration per dyad (also as bilateral aid varies) to ascertain whether in the context of Britain and South Asia and France and North Africa the model in the previous section adequately accounts for variation in immigration that is explained by variance in the multiple correlates of migrant inflows controlled for in the prior analysis and, whether when these factors are controlled for, aid’s positive relationship with immigration remains. I then develop and estimate a series of models using this smaller set of cases to determine whether the significance of foreign aid’s positive pull on immigration is relatively constant between donors. Finally, because it has been shown by the previous analysis that an increase in the restrictiveness a donor’s immigration laws might dampen the gravity of aid, I turn my focus to a consideration of Britain and France’s migration policies and the extent to which these policies may negatively impact immigration despite an increase in foreign aid. However, whether donor migration policy will have a significant effect is uncertain given the high degree of variability in its marginal impact as aid varies and, conversely, the high degree of variability in aid’s marginal impact as migration policy restrictiveness varies.

6.1. Summary of British and French Aid and Bilateral Immigration

6.1.1. French Aid to and Immigration from North Africa. The selection of three North African former colonies of France is not arbitrary. Since 1998, France has made it a
priority to focus its aid on a select number of countries, including its former African colonies (Atwill 2011). In accordance with UN Millennium Development Goals, French foreign aid is prioritized toward projects aimed at reducing poverty, promoting education, improving water sanitation, healthcare, environmental protection, agriculture, transportation, and productive sector development (UNECE 2010). From 1993 to 2010, France committed an average of $247 million (in 2014 US dollars) per year to Algeria, Morocco, and Tunisia, with aid in a given year totaling as much as $1.18 billion (in 2014 US dollars) to as little as $63.5 million (in 2014 US dollars). Over a similar period (1994-2011), France experienced a combined average yearly rate of immigration from these three countries of 15.7 million, with bilateral immigration ranging from as much as 31.1 million total migrants to as little as 2.2 million total migrants in a single year.

6.1.2. British Aid to and Immigration from South Asia. While Britain, like France, also adheres to UN Millennium Development Goals as a part of its strategy for aid allocation, Britain does not focus its aid on a select number of countries as does France (Feikert-Ahalt 2011). For the selected cases, over the period from 1993 to 2010, Britain committed an average of $209.7 million (in 2014 US dollars) to India, Pakistan, and Sri Lanka, committing as much as $917.8 million (in 2014 US dollars) maximum and as little as $1.8 million (in 2014 US dollars) in a single year. From 1994 to 2011, the combined immigration from these three countries to Britain averaged at 18.3 million total migrants, with yearly migration rates ranging from as low as 1 million to as high as 68 million in a single year.
6.2. Observed vs. Predicted Level of Bilateral Immigration in the Context of Britain and South Asia and France and North Africa: Does the Model Work?

There are a number of ways of testing $H_1$ with this relatively small subset of data, but it may be beneficial to first examine how well the predicted values of immigration match the observed values of immigration for these cases. Doing so can permit easier inference of the extent to which foreign aid is positively associated with immigration while controlling for other factors that are likely to have an impact on immigration as well. Without the assistance of a multivariate model, it is tempting to look, for example, at Figure 13 and declare that bilateral aid commitments at year $t-1$ from France and Britain

![Figure 13](image)

**Figure 13.** Relationship between French and British Foreign Aid and Immigration from Selected Former Colonies
are clearly associated with greater bilateral immigration from their respective former colonies at year $t$. However, when a line of best fit is plotted for each dyad rather than for the aggregate data, the slope of the regression line for aid and immigration demonstrates a substantial degree of variance across bilateral relationships. As Figure 14 shows, the case of Britain and Sri Lanka particularly stands out. While the slope of the regression line for this particular dyad is negative, the slope is likely influenced by an outlier year where British aid to Sri Lanka was particularly low relative to other years included in the data. If this year is excluded, a meaningful relationship between British aid to and immigration from Sri Lanka appears nonexistent.

![Figure 14](image-url)

**Figure 14.** Relationship between French and British foreign aid and immigration from selected former colonies by dyad.
It should not be assumed, however, that a case like Britain and Sri Lanka ought to necessarily weaken support for H₁. To the contrary, the models estimated in the previous section account for a number of factors presumed to have an impact on immigration. One of these factors in particular is donor per capita GDP. As Figure 15 demonstrates, there is, without exception, a notable positive relationship between greater donor per capita GDP and recipient migrant inflows. It may be, therefore, that donor wealth is simply a more relevant predictor of immigration relative to foreign aid. Indeed, when the standardized regression coefficients (in this case drawn from the quadratic OLS model from the preceding analysis) are estimated, the comparatively greater impact of per capita

![Figure 15. Relationship between French and British per capita GDP and immigration](image)
GDP relative to aid commitments is clear ($\beta = 0.05$ for aid commitments vs. $\beta = 0.11$ for per capita GDP). Moreover, further comparison of Figure 14 to Figure 16 demonstrates that when the predicted level of migrant inflows at year $t$ is plotted by aid commitments at year $t-1$, the slope of aid's relationship with immigration per dyad is comparable, suggesting, in particular, that the relationship between British aid and Sri Lankan immigration is not really an outlier as one might have originally thought. By accounting for other factors that may exert a more powerful gravitational pull on immigration (such as per capita GDP) the observed values of bilateral immigration to Britain from Sri Lanka are very close to their model predicted values.

**Figure 16.** Predicted Bilateral Immigration by Bilateral Aid Commitments by Dyad
In fact, for this subset of data, the fitted values, overall, match up quite well with the actual values of bilateral migrant inflows. Figure 17 displays the predicted level of immigration by the observed level of immigration for the six dyads under examination. Estimating a simple linear model reveals that the slope of the regression line is nearly equal to 1 (0.93) and that the predicted values, overall, are a good fit for the observed values (adjusted $R^2 = 0.9$).

### 6.3. Estimating the Impact of Aid Commitments from Britain vs. France

While it is useful to demonstrate the extent to which the model estimated in the previous section succeeds in providing relatively accurate fitted values for the dependent variable,
because I also am interested in examining the impact of aid for this particular subset of cases, it is further worthwhile to model the bilateral impact of donor aid commitments on migrant inflows for Britain, France, and their respective former colonies. Doing so may allow for a readier comparison of the extent to which bilateral immigration is uniquely affected by aid in the context of Britain and South Asia versus France and North Africa. I therefore estimate three regression models using OLS. For one, I include data for both Britain and France’s respective dyadic relationships with their former colonies, while for the remaining two I divide my data into two subsets—one for Britain and its former South Asian colonies and the other for France and its former North African colonies—and estimate a model for each subset. In each of the models I include several of the control variables used in the analysis in the previous section.

6.3.1. Model 1. Table 7 displays the estimates for the first OLS model. Not shown are a set of donor and recipient fixed effects. Despite the potential value in controlling for time variant fixed effects when using time-series panel data, given the limited number of cases, I did not include year fixed effects since doing so would substantially reduce the degrees of freedom. I further did not include the lag of the dependent variable on the right hand side of the equation since doing so might rob other variables of their significance given the small number of cases. Of course, while including the lag of the dependent variable in the equation may help to reduce serial dependence, a Durbin Watson test reveals that this variable’s exclusion, though leaving the model with a slight degree of positive serial correlation ($DW = 1.77; p < 0.001$), does not incur a level of serial correlation large enough to interfere with model inference (see Durbin and Watson
### Table 7.
OLS Model Results

*Britain and South Asia; France and North Africa*

<table>
<thead>
<tr>
<th>Bilateral Characteristics</th>
<th>Model Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments</td>
<td>0.09 (0.06)</td>
</tr>
<tr>
<td>Common Language</td>
<td>1.35 (0.24)*</td>
</tr>
</tbody>
</table>

#### Donor Characteristics

| Migration Policy Restrictiveness | -0.02 (0.02) |
| GDP/capita                      | 7.3 (0.64)*   |
| Unemployment Rate               | 0.07 (0.03)*  |

#### Recipient Characteristics

| Severity of Civil Conflict     | -0.002 (0.02) |
| Democracy                      | 0.28 (0.11)*  |

#### Model Summary

| Dyad-Years | 98 |
| Adjusted $R^2$ | 0.91 |

**Notes:** Cell entries are OLS coefficients. Classic standard errors are (in parentheses). Intercept and donor and recipient dummies not shown. See Figure H in the appendix.

*p < 0.05.

1971). The model, overall, appears to perform well with a statistically significant F and an adjusted $R^2$ of 0.91.

While the analysis of the relationship between bilateral aid and bilateral migrant inflows in the previous section revealed a statistically significant positive association between an increase in bilateral aid commitments and bilateral immigration, for this smaller set of cases, the impact of aid fails to reject the null hypothesis. Though its regression coefficient is positive, it falls just short of moderate significance ($p = 0.11$).

Migration policy restrictiveness and the severity of recipient civil conflict also fail to have a meaningful impact. The latter likely fails to have an effect because there is very little variance in the severity of civil conflict per recipient over the time included in this analysis—excepting Algeria and Pakistan where the severity of civil conflict ranged from
0 to 4 and 0 to 6 respectively. In Sri Lanka, which has been enduring a bloody civil war, the level of civil conflict has steadily remained at 5, while in India, the level of civil conflict has ranged from 7 to 10. Meanwhile, in both Morocco and Tunisia the severity of civil conflict has remained at 0.

Regarding migration policy restrictiveness, reasons why restrictions on immigration fail to have a significant impact are discussed later in this chapter.

As for the factors that do have a significant impact, donor per capita GDP, the donor’s unemployment rate (unexpectedly, just as it was in the preceding analysis), a democratic political regime in the recipient, and sharing a common language all have a positive association with immigration.

6.3.2. Model 2 vs. Model 3. While the impact of bilateral aid failed to reach statistical significance in the above analysis, when a similar model is estimated for only Britain and its dyadic relationship with its former South Asian colonies and for only France and its dyadic relationship with its former North African colonies, a notable difference in the impact of British versus French aid is apparent. While British aid to India, Pakistan, and Sri Lanka has a statistically significant and positive estimated effect on bilateral immigration from these countries to Britain, the estimated effect of French aid to Algeria, Morocco, and Tunisia on immigration from these countries to France fails to reach statistical significance.

Besides the positive impact of aid in the British model, British per capita GDP, a shared language with recipients (namely, with India and Pakistan) and a democratic political regime in recipients (India had a democratic regime for the entire period under
### TABLE 8.
OLS MODEL RESULTS
Britain and South Asia

<table>
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<th>Bilateral Characteristics</th>
<th>Model Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments</td>
<td>0.2 (0.1)*</td>
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<tr>
<td>Common Language</td>
<td>1.09 (0.35)*</td>
</tr>
</tbody>
</table>

**Donor Characteristics**
- Migration Policy Restrictiveness: 0.003 (0.04)
- GDP/capita: 7.08 (1.05)*
- Unemployment Rate: 0.07 (0.05)

**Recipient Characteristics**
- Severity of Civil Conflict: -0.04 (0.03)
- Democracy: 0.29 (0.13)*

**Model Summary**
- Dyad-Years: 50
- Adjusted $R^2$: 0.92

**Notes:** Cell entries are OLS coefficients. Classic standard errors are (in parentheses). Intercept and recipient dummies not shown. See Figure H in the appendix.

* $p < 0.05.$

### TABLE 9.
OLS MODEL RESULTS
France and North Africa

<table>
<thead>
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<th>Bilateral Characteristics</th>
<th>Model Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid Commitments</td>
<td>-4.18e-03 (8.25e-02)</td>
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</tbody>
</table>

**Donor Characteristics**
- Migration Policy Restrictiveness: -2.42e-02 (2.83e-02)
- GDP/capita: 5.73 (1.35)*
- Unemployment Rate: 1.75e-04 (4.85e-02)

**Recipient Characteristics**
- Severity of Civil Conflict: 1.56e-02 (3.09e-02)

**Model Summary**
- Dyad-Years: 48
- Adjusted $R^2$: 0.88

**Notes:** Cell entries are OLS coefficients. Classic standard errors are (in parentheses). Intercept and recipient dummies not shown. See Figure H in the appendix.

* $p < 0.05.$
analysis; however, Pakistan and Sri Lanka experienced fluctuation in their political regime type) also are associated with greater bilateral immigration to Britain. Meanwhile, for the French model only French per capita GDP has a positive and statistically significant effect on bilateral immigration from each of its North African aid recipients.

For both models, recipient fixed effects are included; though the results are not shown. For France and its former colonies, control variables for the political regime of the recipients and whether France and its former colonies share a common language is dropped from the analysis since all the recipients are non-democracies and all share a common language with France. The British model’s performance was comparatively
better than France’s with an adjusted $R^2$ of 0.92 in the case of the former as opposed to 0.88 in the case of the latter. For a visual comparison of the three models estimated above, see Figure 18.

6.3.3. The Variability of Aid’s Impact on Immigration. Why does aid seem to have a statistically significant positive impact on immigration in the context of Britain and its former South Asian colonies while it fails to have a significant impact in the context of France and its former North African colonies? Without a direct way to gage the extent to which citizens of these countries factor aid commitments into their estimation of the costs and benefits of immigrating it is hard to answer this question with any certainty.

Nevertheless, it can be said with (some) certainty that if variability in aid’s impact exists within this subset of cases, it may exist within a larger set of cases as well. There is nothing shocking about this idea. Within any set of observations there is an inherent degree of variability, and though statistical analysis can reveal larger trends, divergent cases should never surprise. Both aid commitments and immigration are examples of human behavior—the former is the result of human decisions to allocate monetary resources while the latter is the result of human decisions to move across geographical and national boundaries. Predicting human behavior is fraught with uncertainty due to the complexity of decision-making at the individual level.

This theoretically unsatisfying answer might suggest complacency with unexplained variability, but it should rather serve as a challenge for future researchers to better explain why bilateral aid might account for variance in bilateral migrant inflows in some cases while failing to do so in others. An answer to this question is not clear from,
and is further beyond the scope of this analysis. However, it is possible to hazard a guess that because France is more targeted in its aid compared to Britain (especially when it comes to France's former colonies), the effect of French aid to its former North African colonies is less likely to result in an increase in immigration from these countries into France; although, more work needs to be done to give this speculation greater explanatory weight.

6.3.4. Here's the Pull; Where's the Pushback? The influence of certain other factors appear to have a much less meaningful impact for these selected cases compared to their impact when a substantially larger dataset is analyzed. Donor migration policy

![Figure 19. The Impact of Donor Immigration Policy Restrictiveness on Immigration by Dyad]
restrictiveness, for example, has a minuscule effect on immigration per dyad according to the three OLS models estimated above. In fact, Figure 19 suggests that for Britain and its former South Asian colonies, an increase in the restrictiveness of Britain’s immigration laws appears to have a slight positive association with immigration. Meanwhile, for France and its former North African colonies the relationship between migration policy restrictiveness and bilateral immigration is nearly flat. Why is it that pull factors (such as donor aid commitments and donor per capita GDP in the case of Britain and its relationships with India, Pakistan, and Sri Lanka; and per capita GDP in the case of France and its relationships with Algeria, Morocco, and Tunisia) have a significant impact on immigration while factors that would be expected to have a negative impact on immigration (especially donor immigration policy) lack a significant effect?

The fact that an increase in the restrictiveness of Britain and France’s immigration laws failed to have a significant impact on migrant inflows is indication that the marginal impact of aid on immigration as migration policy restrictiveness varies is unlikely to be much impacted by the passage of stricter immigration laws. In the case of France and its dyadic relationships with Algeria, Morocco, and Tunisia, bilateral aid has no statistically significant impact on immigration anyway, which means any variability in aid’s marginal effect would be unlikely to matter much, if at all.

Within the context of this subset of cases, one likely reason why legislative barriers against immigration failed to have an impact is the highly generalized nature of immigration policy in both Britain and France. A survey of major pieces of immigration legislation passed in both countries suggests that British and French policymakers are apt to pass immigration laws that are more sweeping, rather than focused, in scope—at least
In 1996, for example, British lawmakers passed the 1996 Asylum and Immigration Act, which eliminated the need for police and immigration officers to obtain a warrant for the arrest of individuals suspected of committing immigration offences. Furthermore, in 2005 a law went into effect in Britain requiring applicants for naturalization to both pass a test about “life in the UK” and demonstrate competency in the English language. In 2007, the requirement for taking this test was expanded to include those seeking permanent residence. Meanwhile, in France, a law was passed in 1997 that reinforced the police’s power to control immigration at its border. And in 2007, a law was passed that required family reunification applicants to take a test in their country of residence on French values and the French language.

Though these laws vary in their purpose, they all share a common thread: they broadly target all foreigners; not particular nationalities. Namely, in the context of this subset of cases, France and Britain, from 1993 to 2010, did not pass any laws that were intended to restrict or relax immigration from Algeria, Morocco, and Tunisia (in the case of the former) or from India, Pakistan, and Sri Lanka (in the case of the latter), which may explain why variation in the restrictiveness these countries’ immigration policies failed to have an effect on immigration within the context of this narrow set of cases.

6.4. What Do These Cases Ultimately Say about the Relationship between Aid and Immigration?

This chapter’s primary motivation is to examine the relationship between aid and

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1 Laws (and their descriptions) passed in each country were cited from the DEMIG Policy dataset.
immigration in the context of a narrower set of cases, thereby allowing for an assessment of the ability of the large $N$ model estimated in the previous quantitative analysis to offer fitted values for immigration that correspond well with the observed values. In short, the model appears to offer predictions consistent with the actual values for the dependent variable, at least in the context of Britain and a selection of its former South Asian colonies and in the context of France and a selection of its former North African colonies. However, further analysis using data from only this subset of cases reveals some variability in the consistency of bilateral aid’s ability to account for some of the variance in bilateral immigration: while aid seems to have a positive impact on immigration in the context of Britain and its relationships with India, Pakistan, and Sri Lanka, aid fails to have a statistically significant impact in the context of France and its relationships with Algeria, Morocco, and Tunisia. This variability may, in part, explain why the estimated coefficient for aid’s impact on immigration, *ceteris paribus*, is so small. In fact, an as yet discussed qualification of these findings is that the practical significance of aid’s positive pull on immigration remains unclear. While, by and large, bilateral aid’s modeled impact on bilateral migrant inflows is both positive and statistically significant, exponentiation of the results (both aid and immigration were log transformed) suggests that a $1.7$ million increase in bilateral aid commitments for a given year is associated with an increase in bilateral immigration by about $73$ migrants (+/-10) the following year. Compare this result to the impact of per capita GDP. An increase in donor GDP by only about $2.70$ per capita for a given year is associated with an increase in bilateral immigration by about $3,320$ migrants (+/-1,246) the following year, all else being equal. While the impact of aid seems comparatively small relative to the impact of donor GDP per capita, the
variability in aid's significant impact across cases suggested by the analysis of British versus French aid advises caution against assuming that aid's impact will always be relatively small. To the contrary, in the case of Britain and its bilateral relationships with its former South Asian colonies, the estimated impact of a $1.7 million increase in bilateral aid in a given year is associated with an increase in bilateral immigration by 221 migrants (+/-101) the following year. These rates are, by no means, substantial, but they differ sharply from the estimated impact of aid for the larger set of cases included in the previous analysis. Aid's impact, therefore, should not be considered a given; however, neither should it be ignored.
7. DISCUSSION AND CONCLUSION

7.1. Rationale and Contribution to Research

Not until recently has the impact of immigration on donors’ decisions to allocate greater aid been addressed in the literature. Bermeo and Leblang (2015) recently examined the hypothesis that donor countries increase bilateral aid commitments to migrant sending countries in response to an increase in immigration from those countries. The authors speculate that policymakers, under the assumption that aid is a reliable tool for promoting improved economic conditions in aid recipients, view increasing bilateral aid as a potential means for curbing unwanted immigration. Though they find robust support for this hypothesis, Bermeo and Leblang (2015) give the question of whether this strategy accomplishes the goal of reducing immigration only passing consideration. They, like many scholars, argued that using foreign aid as a policy tool for curbing immigration is unlikely to succeed (at least in the short-term). However, this perspective, though common, has to date been founded upon little more than speculation—albeit reasonable speculation—but little systematic empirical analysis. Moreover, entirely missing from the literature is a consideration of aid’s potentially positive pull on immigration: aid may function as a signal to residents in aid recipients of donor wealth, and an increase in aid could conceivably make the donor appear like a more appealing destination. This study attempts to fill this gap in the literature.

7.2. Summary of Methods and Findings

By estimating a “gravity-type” equation for dyadic time-series panel data, it was possible to model the impact of bilateral aid commitments on immigration while controlling for
other relevant predictors of bilateral migrant flows as well as accounting for time-invariant and time-variant fixed effects. Using both ordinary least squares (OLS) and Tobit estimation, analysis found a positive relationship between the natural log of (one plus) bilateral aid commitments at year \( t-1 \) and the natural log of (one plus) bilateral migrant inflows at year \( t \). These results support the theory that aid may function as a signal of greater donor wealth and thus may attract greater numbers of migrants from an aid recipient, *ceteris paribus*. However, additional analysis revealed that aid and immigration may have an upside-down-J curvilinear relationship. The results from a model that assumes immigration is a quadratic function of bilateral aid were statistically significant: the effect of bilateral aid was positive, but the effect of the squared value of aid was negative.

In addition to examining the impact of aid on immigration, this study also considered whether aid’s impact might be contingent upon a number of factors associated with donor-recipient ties and recipient regime characteristics. However, further analysis failed to find a significant interaction effect between bilateral aid and donor-recipient commonalities such as a common language and past colonial ties, suggesting that aid’s positive pull is not contingent on the presence of such bilateral links. Continued analysis also failed to find a significant interaction effect between aid and a recipient’s political regime, further indicating that when a recipient is a democracy, aid has no additive positive impact on immigration.

Further exploration of whether aid can “defy gravity” suggested that aid’s pull is diminished (though not overly so) when donors increase the restrictiveness of their immigration policies, and it is diminished (though not overly so) when there is greater
bilateral distance between donor and recipient. However, though the marginal impact of aid appeared to slightly decline as immigration restrictions increased and when bilateral distance was greater, the margin of error varied substantially, warranting caution in interpreting the results. Similarly, the negative marginal effect of both immigration policy restrictiveness and bilateral distance seemed to increase as aid commitments increased, but, again, there was a great deal of variance in aid’s impact on these variable’s marginal effects.

Further insight was gleaned by taking a close look at a selection of cases from the larger dyadic panel dataset. An examination of the comparability of the quadratic model’s fitted values with observed values for bilateral immigration for Britain and its dyadic relationships with three of its former South Asian colonies (India, Pakistan, and Sri Lanka) and for France and its dyadic relationships with three of its former North African colonies (Algeria, Morocco, and Tunisia) suggested that the model performed relatively well. However, additional analysis of the relationship between aid and immigration, *ceteris paribus*, for this subset of cases revealed significant variability in aid’s impact on immigration. While British aid to India, Pakistan, and Sri Lanka appeared to have a positive impact on bilateral migrant inflows, French aid to Algeria, Morocco, and Tunisia had no such effect.

### 7.3. Discussion and Implication of Findings

#### 7.3.1. Why a Curvilinear Relationship?

The results from this study suggest a number of important implications, both for researchers and for policymakers. First, the finding that aid may have a curvilinear relationship with immigration raises a number of questions
that future research will need to explore. Why does aid’s positive pull on bilateral migrant inflows diminish and eventually reverse as aid commitments increase? Earlier in this study, two possible answers to this question were offered.

On the one hand, it could be that aid’s curvilinear impact on immigration is merely the result of bilateral migrant inflows reaching an upper threshold. Each country has only a limited pool of potential emigrants, and it could be that as this pool shallows, the rate of out-migration necessarily slows. Once this limit is reached, even if bilateral aid commitments increase, bilateral immigration will not follow suit.

On the other hand, it may be that donors, because they want a sensible return on investment, will commit greater amounts of aid to countries that are likely to make good use of that aid. If good use of aid translates into more noticeable improvements in economic, social, and living conditions, the pull of aid may be washed out as would-be migrants now have less incentive to leave their home country.

At any rate, this analysis alone does not offer sufficient evidence to support either of these accounts, nor does it exclude other possible explanations. Future research will need to address this issue, not only for the sake of intellectual curiosity, but also because policymakers have an obvious interest in understanding the unique impact that aid commitments have on bilateral immigration.

7.3.2. Is Aid’s Positive Pull a Given? Examination of the relationship between aid and immigration for Britain and a selection of its aid recipients and for France and a selection of its aid recipients reveals some inconsistencies in aid’s impact. Why does aid appear to have a significant pull on immigration in the case of the former and lack a significant
effect in the case of the latter? This is an important question for future research since having an explanation for under what conditions a phenomenon is likely and unlikely to occur makes for a more robust theoretical account. Such an account would further have useful policy implications since donors have an interest in knowing what effects bilateral aid is likely to have in varying contexts.

7.3.3. Is Aid’s Positive Pull on Immigration of Practical Consequence? The question of whether aid’s positive impact on immigration is of much material consequence is an especially important concern of policymakers. As was discussed in a preceding section, when the pull of aid is compared to the pull of other factors (namely, donor per capita GDP), aid’s impact is relatively small. Thus, while aid’s estimated effect on bilateral migrant inflows is statistically significant, its real world significance is uncertain. If an increase in aid is unlikely to result in an increase in migrant inflows by anything resembling a staggering magnitude, policymakers may not have much cause to be practically concerned about aid having the opposite effect from its original intent: though aid may lead to an increase in bilateral immigration, rather than a decrease, the expected increase may not be substantial enough to warrant reducing bilateral aid. However, while an increase in bilateral aid may have a relatively small positive impact on immigration from a single recipient, a small increase in immigration from multiple countries at once would represent a total increase in immigration that is much more substantial. Thus, the practical significance of aid’s impact is contingent upon the scale at which aid’s impact is considered. If considered on a case by case basis, the impact of aid may be relatively small, but if considered in aggregate, its effect may be of material significance.
It should be noted, however, that outside of the impact of aid on immigration, the consequences of greater rates of immigration for donors is not considered here. It is not assumed by this study that greater levels of immigration incurred by an increase in bilateral aid is of either negative or positive consequence for donors overall. Though research suggests that immigration is not utterly detrimental to immigrant receiving countries (it even may be beneficial), a consideration of whether or how policymakers ought to adjust aid commitments in pursuit of national self-interest as it relates to immigration (however that may be defined) is beyond the scope of this analysis.

7.4. Conclusion

Though the findings from this study support the theory that foreign aid may function as a signal of donor wealth and thus result in greater immigration from aid recipients in response to an increase in bilateral aid, more work needs to be done to parse out the finer details of aid’s relationship with immigration. Why does the positive pull of aid diminish and eventually reverse as bilateral aid increases? Under what conditions is aid’s impact likely to be of practical significance? There also is the as yet unaddressed question of whether more recent developments in donor countries’ attitudes toward majority Muslim countries have impacted donors’ migration policies and their decisions to allocate aid toward these countries.

The need for further research, therefore, is clear. Results from individual studies in any discipline should never be given the weight of scholarly consensus. Because this analysis represents the first attempt to systematically examine the impact of bilateral aid on bilateral immigration, the conclusions reached herein should not have the final word in
the debate regarding the usefulness of aid as a policy tool for curbing the demand for immigration. Thus, it is this author’s hope that this study, though the first attempt to examine this phenomenon, will not be the last.
8. APPENDIX

8.1. Summary Statistics and Sample

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<th>TABLE 10. DESCRIPTIVE STATISTICS</th>
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<tr>
<td><strong>Min.</strong></td>
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<tr>
<td>Bilateral Aid Commitments (in millions of 2014 US $)</td>
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<tr>
<td>Migrant Inflows (in thousands of migrants)</td>
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<tr>
<td>Weighted Bilateral Distance (in km)</td>
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<td>Donor Unemployment Rate</td>
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<td>Donor GDP (in millions of 2005 US $)</td>
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<td>Donor Population (in millions)</td>
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<td>Donor Migration Policy Restrictiveness</td>
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<td>Recipient Polity 2 Score</td>
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<td>Recipient Civil Conflict</td>
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8.1.1. Aid Donors. Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

8.1.2. Aid Recipients. Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, Chile, China (People's Republic of), Chinese Taipei, Colombia, Comoros, Congo, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Democratic People's Republic of Korea, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran, Iraq, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Qatar, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovenia, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Swaziland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Venezuela, Viet Nam, Yemen, Zambia, Zimbabwe.
8.2. Tools Used for Data Analysis

Statistical analysis was conducted using R (version 3.3.0, “Supposedly Educational”). Functions in the following R packages were used in model estimation: plm, lmtest, and VGAM. And the following packages were used for data visualization: ggplot2 and mgcv.

R is collaborative and open source. Numerous individuals are responsible for the development of these packages, and references for each can be found among the other references cited for this paper in the references section.

8.3. About the Estimation of Heteroscedasticity-Robust Standard Errors in R

While some types of statistical software provide the prerequisite tools for estimating heteroscedasticity-robust standard errors with the degrees of freedom adjustment outlined by Stock and Watson (2008), no such tool has been developed for R. However, R’s flexible environment makes it fairly easy to compute degrees of freedom adjusted clustered standard errors by using existing packages and tools already available in R.

After estimation of a linear model, the following degrees of freedom adjustment \( (df_a) \) for the robust standard errors can be computed:

\[
df_a = \left( \frac{G}{(G - 1)} \right) \left( \frac{(N - 1)}{(N - K)} \right)
\]

\( G \) is the number of clustered groups in the dataset (in this case, dyads), \( N \) is the number of observations, and \( K \) is the number of variables (including the intercept and fixed effects) included in model estimation. Once computed, this degrees of freedom adjustment can
be simply multiplied by the robust covariance matrix of parameters estimable using the \texttt{vcovHC()} function in the \texttt{plm} package (see Zeileis 2004), the product of which is a degrees of freedom adjusted robust covariance matrix where the heteroscedasticity-robust clustered standard errors are the square root of the diagonal elements of the matrix.
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