U.S. Aid and Economic Growth in Low- and Middle-Income Countries:
The Impact of U.N. Security Council Membership

Anastasia Aladysheva

Submitted to

Central European University

Department of Economics

In partial fulfillment of the requirements for the degree of Master of Arts

Supervisor: Professor Miklos Koren

Budapest, Hungary

2009

Abstract

The central objective of this thesis is to re-examine the relationship between U.S. foreign aid and growth of per capita GDP in low- and middle-income countries. Using data from 139 countries covering 61 years, the OLS estimation shows that there is no effect of aid on growth. Controlling for endogeneity by introducing U.N. Security Council membership as an instrumental variable for aid, 2SLS estimation supports this conclusion. The main implication of these results is that the U.S. allocates aid strategically and not just for the development purposes. Moreover, the recipient countries are constrained by the numerous economic, political and institutional factors that impede their development and growth. This result does not suggest that aid cannot be efficiently allocated in the future, but important steps should be made by the governments of the recipient countries as well as the donors to reduce the influence of these constraints.

Keywords: U.S. foreign aid, growth rate, U.N. Security Council membership.

Contents

List of Tables

List of Figures

Introduction

> *More than half of the people of the world are living in conditions approaching misery. Their food is inadequate. They are victims of disease. Their economic life is primitive and stagnant. Their poverty is a handicap and a threat both to them and to more prosperous areas. For the first time in history, humanity possesses the knowledge and skill to relieve the suffering of these people.*
>
> *US President Harry Truman, 1949*

With these words of U.S. President Harry Truman, the history of foreign aid officially began. To date, the concept of foreign aid has been shaped with a principle goal of promotion sustainable economic development and growth in poor countries. Since its inception, the impact of foreign aid has been discussed and different views have been formed. Truman's words sound very altruistic. Indeed, today the U.S. provides almost 30% of all official bilateral aid, which makes it one of the biggest donors in the world. However, many political economists argue that, throughout the history of aid-giving, besides humanitarian and development purposes, the U.S. and other donors extract political, commercial and other strategic benefits by providing aid to developing and stagnant countries.

The existing evidence of many empirical studies that examine the impact of aid on economic growth in a large number of countries varies substantially. In panel-data estimation Burnside and Dollar (2000) find that aid leads to growth only in the countries with strong institutional and policy foundations. Hansen and Tarp (2001) claim that aid in all likelihood increases the growth rate, while Rajan and Subramanian (2005) find no evidence in cross-sectional and panel-data estimations that aid has an impact on growth. Due to such polarized views, it is worth re-examining the alleged effects of aid on economic growth.

Much debate in the economic literature has been devoted to the problem of aid endogeneity. It might be that aid stimulates the economic growth, which will explain a positive relationship between the financial assistance provided and the economic growth of a country. If aid is given to a country in the wake of a natural disaster, then there will be a negative correlation between the two. At the same time, the countries with lower growth rates may receive more aid which may result in the simultaneity bias in the aid-growth regressions. Since the relationship between foreign aid and growth rate is not obvious, it is important to separate out the exogenous component of aid.

This thesis contributes to the existing literature by proposing a new econometric methodology. Using country-level panel data, in addition to directly estimating the impact of aid on real growth of GDP per capita, I use United Nations Security Council membership as an instrumental variable (IV) for aid. In order for Security Council membership to serve as a valid instrument, it should be strongly correlated with aid and uncorrelated with an error term in the growth regressions. Ilyana Kuziemko and Eric Werker (2006) showed that U.S. aid increases by 59% when a country rotates onto the council and it increases by 170% when a country serves during a key diplomatic year. In the estimation I follow the empirical strategy of Kuziemko and Werker (2006), but I extend the dataset by observing 139 countries over 61 years. I show that membership in the Security Council increases the aid received by developing country from the United States by almost 50%, whereas it increases by 77% when a country serves during a politically important year for the United States. As Kuziemko and Werker (2006) I claim that membership in the U.N. Security Council is almost purely random, therefore, it is likely to be exogenous in the growth regressions. Since membership in the U.N. Security Council is strongly correlated with U.S. aid, it serves as a valid instrument and corrects for the simultaneity bias. In order to estimate the impact of

U.S. aid on growth of per capita GDP, I perform both Ordinary Least Squares (OLS) and Two Stage Least Squares (2SLS) estimation methods. The OLS reports a positive but statistically insignificant estimator. When correcting for the bias, the IV estimation results support the conclusion that aid does not have any impact on growth of a country's GDP per capita.

The findings of my thesis suggest that the U.S. exerts great influence on the resolutions that are adopted in the U.N. Security Council by "buying" additional votes from the member countries. Therefore, the humanitarian and development purposes of U.S. aid amount to a small part in all U.S. aid provided, and strategic considerations behind aid are highly influential. In other words, from the viewpoint of the principles of foreign aid a major amount of U.S. aid is allocated inefficiently and not according to the needs of poor countries.

The remainder of the thesis is organized as follows. I review the economic literature which examines the impact of foreign aid on growth in Chapter 1; Chapter 2 discusses the political economy of U.S. aid and the U.N. Security Council membership. Chapters 3 and 4 provide the empirical strategy, specification of the model and the data used for estimation, while in Chapter 5 the results of the estimation are presented. The final part offers concluding remarks.

1. Economic literature review

Early studies that go back to the 1960s and the 1970s investigated the impact of foreign aid on domestic savings and investment. Hansen and Tarp (2000) analyzed the early empirical literature and concluded that "aid leads to an increase in total savings, although not by as much as the aid flow" (p.7), and aid increases investment. However, Easterly (2003) argues that early literature is inconclusive, mainly because of the limited data availability and poor econometric tools.

A shift in economic literature occurred in the 1990s when Boone (1996) investigated the relationship between aid, investment and growth. He found that aid financed consumption rather than investment, but the consumption benefits of aid go to wealthy elite and do not reach many people who live in poverty and cannot afford the basic food and water for themselves. Moreover, Boone (1996) showed that there was no impact of aid on growth.

Many political economists suggest that aid may only work in the environment where policies and institutions are reasonably established. Empirical evidence for this was provided by Burnside and Dollar (2000) who investigated the relationship between aid, policies and growth based on the sample of 56 countries covering six four-year time periods. They demonstrated that aid has a positive impact on growth in low-income countries with "good fiscal, monetary and trade policies but has little effect in the presence of poor policies" (p.1). This result was very influential among the political and economic communities. However, it has a direct association with the problem of selectivity which Easterly (2003) and Quibria (2004) mentioned: aid should be directed selectively only to the countries with good policies.

This raises a contradiction that a country with the worst problems and the greatest need receives the least money.

Easterly, Levine and Roodman (2003) followed the specification and estimation method of Burnside and Dollar (2000), but expanded the dataset. They found that the coefficient of the interaction term between aid and policy was insignificant and were sowing doubt that aid works in a good policy environment. Hansen and Tarp (2000) also mentioned that the results of Burnside and Dollar (2000) are very sensitive to data specifications: "we can make the crucial aid-policy interaction term significant, and by adding five observations (an extension of the sample by 2.1%) we can also turn off this result" (p.21). Later, Hansen and Tarp (2001) re-examined the relationship between aid and growth and found that aid in all likelihood increases the growth rate, and this result is not conditional on policies.

On the contrary, Rajan and Subramanian (2005) carried out a panel estimation including 107 countries in the sample and concluded that there is no impact of foreign aid on growth, suggesting that there should be more effort at national and international levels to improve aid effectiveness. Doucouliagos and Paldam (2005) analyzed 97 econometric studies on aid effectiveness and concluded that aid has not been effective.

Besides investigating the effect of aid on growth, Collier (2007) emphasized how to make aid allocation more efficient. He classified the traps that the poor countries might fall into and that prevent them from developing: the conflict trap, the trap of being landlocked, the natural resource trap and the trap of bad governance. In order to promote sustainable growth, aid and other kinds of assistance should be directed to all of the problematic spheres effectively. According to Collier, aid happens to be particular effective in raising the growth rate in postconflict situations in a poor country. He emphasized that it is necessary to break the trap of being landlocked by improving the country's transport links to the coasts. Also

he said that aid makes private investment more attractive and so helps to keep capital in the country and reduce the capital flight. Collier stressed that aid is effective where government and policies are already reasonable. However, he pointed out, that "the problem is designing aid in such a way that it works even in the environments of poor governance and poor policy." (p.107) He suggested a mechanism of how to promote reform in the country more efficiently: "aid is not effective in inducing the turnaround in a failing state; you have to wait for political opportunity. When it arises, pour in the technical assistance as quickly as possible to help implement reform. Then, after a few years, start pouring in the money for the government to spend" (p.116).

Browne (2006) wrote about the strategic considerations behind foreign aid and in his view the protectionism in the markets deserved attention. He argued that the developed countries put up barriers to exports from the developing world in order to stimulate their own manufacturing and agricultural sectors. These trade policies depress the exports from the developing countries. As Browne noted, "the costs to the developing countries of unequal access to markets are substantially larger than the value of net aid transfers, prompting the conclusion that developing countries would be better off with less aid, but fairer trading rules" (p.29). Erixon (2005) also suggested that the amounts of aid should be cut, because it has been counterproductive. It has undermined democracy and increased corruption in poor countries.

Overall, the views of the economists and the empirical evidence of their studies are mixed. There is no a definite answer on the question if foreign aid affect economic growth. My paper contributes to the existing economic literature by proposing a new methodology. In addition to directly estimating U.S. aid on growth of GDP per capita, I use U.N. Security Council membership as an IV for aid. The idea of using such an IV comes from the work of

Kuziemko and Werker (2006). They estimated the effect of membership on U.S. aid and found a positive and highly significant relationship between the two. Using a two-step empirical strategy Tamura and Kunieda (2005) found similar results. It is worth mentioning that many economists "instrumented" aid before. Hansen and Tarp (2001) as well as Burnside and Dollar (2000) used policy variable as an IV. Clearly, policy is not really exogenous and is correlated with growth. Since Security Council membership is almost purely random, it is less likely to be endogenous. There are no previous studies that used Security Council membership as an IV for foreign aid. Therefore, the current methodology is unique in the literature.

2. Political economy of U.S. aid and the U.N. Security Council

The U.S. gives more foreign aid than any other nation.[1] As one of the wealthiest countries in the world[2], the U.S. is concerned about the development and economic growth in poorer countries. One of the primary purposes of U.S. aid is to assist developing countries in building the infrastructure, training the specialists and providing medical help. The U.S. is one of the first to provide assistance in case of a natural disaster. For example, it was the biggest aid contributor for the tsunami relief that broke out in South Asia in December 2004.

At the same time, the concerns about international development are closely related to the U.S. security and strategic interests. In other words, the U.S. allocates aid to the countries where it can pursue its national interests. Indeed, since its inception in 1948, foreign aid that was provided by the U.S. under the Marshall Plan to reconstruct postwar Europe had not only development purposes, but also political ones as the U.S. tried to prevent the spread of communism in Europe. During the Cold War foreign aid was directed at developing countries where the U.S. could build political and economic relationships in order to expand its world power. Furthermore, the U.S. historically has the strategic interests

[1] The U.S. gives more "cash" than any other donor country (see Figure 5 in Appendix). However, when comparing the top 15 donors by the ratio of foreign aid provided to their Gross National Income (GNI), the U.S. ranks to be one of the last by providing 0.18% of its GNI. This value is far below the official level of 0.7% of a country's GNI, agreed by the United Nations General Assembly Resolution in 1970. (According to the Millennium Project website http://www.unmillenniumproject.org/press/07.htm). (See Figure 6 in Appendix)

[2] According to the International Monetary Fund (2008), the U.S. ranks the 15th in GDP per capita among all the countries.

in the Middle East. Alesina and Dollar (1998) found considerable evidence that since the 1970s the U.S. "has targeted about one-third of its total assistance to Egypt and Israel." (p.22)

The concept of providing development aid has evolved in the US over time. According to the U.S. Agency of International Development (USAID), one of the five key goals of proving aid is "supporting U.S. geostrategic interests" (USAID 2004, p.5). Moreover, the U.S. foreign assistance is now directed more at providing national security than at achieving humanitarian and development goals. In the aftermath of the events of 11 September 2001, the U.S. started to allocate massive amounts of aid to the countries considered as a shelter for the world terrorism.

As the most prominent international actor, the U.S. also influences other donors and international organizations in their decisions about the allocation of foreign aid. In particular, the U.S. uses aid as a tool for advancement of its political interests in the U.N. Security Council.[3]

The use of foreign aid has had a strong impact on the most controversial decision of the Security Council in the past two decades. As Renfrew (2003) writes, the U.S. promised "rich rewards" to the non-permanent members of the Security Council to adopt the resolution of authorizing the military invasion in Iraq. Tamura and Kunieda (2005) point out that the Bush administration has tripled its aid to Africa since 2000, while the U.N. suggested an enlargement of the Security Council, providing two new additional seats to African

[3] The Security Council is the main body of the United Nations that is responsible for maintenance of peace and security in the world. It consists of five permanent members – China, Russia, France, the United Kingdom and the United States – and ten non-permanent members. Each non-permanent member is elected to serve during two consecutive years. During the years of membership a country has a right to vote on Security Council resolutions. Nine votes from the ten non-permanent members are needed in order to authorize the resolution, including the votes of the five permanent members. Each permanent member has a right to veto a resolution, i.e. to prevent a resolution to pass. (U.N. Security Council website, Tamura and Kunieda, 2005, Kuziemko and Werker, 2006)

countries. They show that the U.S. "trades aid for rotating members' votes on vital issues": "the higher the stakes for the U.S. on a given resolution, the more foreign aid the U.S. distributes in order to secure votes, unless the secured votes are negated by veto powers that other permanent members might exercise." (p.7) In addition, Kuziemko and Werker (2006) demonstrate that the country that serves in the Security Council during two-year term gets 59% more aid from the U.S. and this effect increases during the key diplomatic years.

The above findings suggest that the U.S. tends to have a large influence on the adoption of resolutions that are proposed in the U.N. Security Council by promising financial assistance to the countries that serve in the Security Council non-permanently. Therefore, many disappointing results in the economic literature, which investigated the effect of aid on growth and found a negative or no correlation between the two, might be caused by the strategic rather than need-based purposes of U.S. foreign aid.

3. Empirical strategy and specification

Economic growth is the primary indicator of the prosperity of a nation. Therefore, it is a matter of concern of many economists and policy makers in the world. In order to create good macroeconomic policies to achieve high and sustainable economic growth it is necessary to understand its determinants. According to the Organization for Economic Cooperation and Development (OECD), the main objective of foreign aid is to promote the economic development and welfare of developing countries. Thus, foreign aid is initially created to serve as one of the determinants of economic growth. In order to test current hypothesis, I use econometric tools.

The problem of estimating the effect of foreign aid on growth rate is that the direction of the causality is not definite. Foreign aid might affect growth, but also countries with lower growth rates may receive more aid. The reverse causality problem causes the simultaneity bias in the coefficient on aid. Therefore, if estimating the effect of aid on growth directly by Ordinary Least Squares (OLS) method, the estimates will be biased and inconsistent. In order to consistently estimate the coefficient on aid, I use the method of Instrumental Variables (IV) or Two-Stage Least Squares method (2SLS).

I use U.N. Security Council membership as an IV for foreign aid. In order for the Security Council membership to serve as a good IV, it should be strongly correlated with the aid flows and uncorrelated with the error term in the growth regressions. I assume that U.N. Security Council membership is purely random. This assumption is consistent with the works of Kuziemko and Werker (2006) and Tamura and Kunieda (2005). Therefore, by

current assumption membership is uncorrelated with the error term in the growth regressions. In my estimation process, I check for the correlation between foreign aid and Security Council membership as well.

In the estimation process I use both methods, OLS and 2SLS, and compare the results obtained.

3.1 Aid and U.N. Security Council membership

In order to estimate the effect of Security Council membership on aid I follow the empirical strategy of Kuziemko and Werker (2006). The estimated equation, including other control variables, is:

$$\ln\left(Aid_{it}\right) = \alpha + \beta * SCMember_{it} + \gamma * X_{it} + W_{rt} + \mu_i + \eta_t + \varepsilon_{it}, \qquad (3.1)$$

where *i* is a country index, *t* is a time index, *SCMember* is a dummy variable, which takes a value of *1* if a country serves in the Security Council during a particular year, X_{it} is a vector of the control variables, W_{rt} is a regional time trend[4], μ_i and η_t are country and year fixed effects, and ε is an error term.

In the current econometric model I expect a positive relationship between membership and aid flows to the country. But the coefficient on *SCMember* might be positively biased if a country serving a two-year term in the Security Council might use its membership to draw attention of the world community to its "problems". In other words, a country might get more aid because its "holes" in political and economic environment became more visible to the donors than if a country "sells its votes" to the U.S. In order to separate the effect of "vote-selling" a slightly modified model can be specified as:

[4] More specifically, W_{rt} is an interaction term between the region and the year. The regions are South America, Central and South Asia, East Asia, Middle East, Africa, Eastern Europe. This variable captures the special interests of the U.S. in particular regions. The regions are dummies that take value of *1* if a country belongs to a particular region.

$$\ln(Aid_{it}) = \alpha + \beta * SCMember_{it} * Level\_of\_Importance_{t} + \gamma * X_{it} + W_{rt} + \mu_i + \eta_t + \varepsilon_{it}, \quad (3.2)$$

where *Level_of_Importance* represents the dummy variables: *ImportantYear* and *UnimportantYear*. Each variable takes value of *1* if a political event that happened in a particular year is important and not important for the U.S. correspondingly. [5] Both groups of year dummies contain almost equal number of years. I expect the interaction term between *SCMember* and *ImportantYear* to be positive and significant if a country gets more U.S. aid during a politically important year.

It would also be interesting to see a magnitude of aid flows during different adjacent years:

$$\ln(Aid_{it}) = \alpha + \beta_{-1} * T-1_{it} + \beta_0 * T0_{it} + \beta_1 * T1_{it} + \beta_2 * T2_{it} + \beta_3 * T3_{it} + \beta_4 * T4_{it} + \gamma * X_{it} + W_{rt} + \mu_i + \eta_t + \varepsilon_{it}, \quad (3.3)$$

where *T-1* is the year prior the year of election to the Security Council, i.e. two years before serving period, *T0* is the year of election, *T1* and *T2* are the years of serving, *T3* and *T4* are one year and two years after the term correspondingly.

As Kuziemko and Werker (2006) suppose, if the coefficients β_0, β_1 and β_2 are larger than the others, then the hypothesis that the country which serves sells its votes to the U.S. during the term is more credible. On the other hand, if β_{-1} is larger than other coefficients, then the country's ability to extract aid is correlated with the probability of being elected to the Security Council. If aid flows are larger after the years of serving, then it might mean that during the term the serving country attracted attention of other countries to its needs than if a country has the ability to extract aid for the votes.

[5] I present a table of important political events and years in Appendix in Table 4. I also experiment with other specification of important years as a robustness check which is proposed by Kuziemko and Werker (2006) where they divide the years into three categories. The results of the estimation are presented in Appendix in Table 5.

3.2 Growth, aid and U.N. Security Council membership

Intuitively, aid might bring benefits to economic growth not immediately but after some period of time. Since growth of GDP per capita is highly volatile, I take the decade averages. [6] Therefore, I use previous decade averages of aid flows and look at the effect of it on the current decade averages of growth of GDP per capita. The basic model can be specified as:

$$growth_{it} = \alpha + \beta \ln\left(GDP_{it}\right) + \gamma \ln\left(aid_{it-1}\right) + \delta * X_{it} + \mu_i + \eta_t + \varepsilon_{it}, \qquad (3.4)$$

where *i* is a country index, *t* is a time index, *growth* is the average growth of GDP per capita, *aid* is the average aid flows divided by population, *GDP* is the initial GDP per capita, X_{it} is a vector of the control variables, μ_i and η_t are country and year fixed effects, and ε is an error term. I divide aid flows by population to control for a country's size, because the effect of the same amount of aid on a growth of a big country will be less than of a small one.

I estimate equation (3.4) using both OLS and 2SLS methods. In order to use 2SLS, previously I assumed that Security Council membership is purely random. In other words, it is not correlated with an error term in the regression. But if this is not the case, then the estimator can have a bias. Suppose that if a country is in a better "shape", it is more likely to be chosen by the U.N. to serve in the Security Council. Then the coefficient on *aid* is upward biased.

Initial GDP per capita has the interpretation of a conditional rate of convergence (Barro 2001). In economic theory, countries with lower initial GDP per capita experience faster growth on their way to the long-run equilibrium level. So I expect a negative coefficient β.

[6] Current specification is consistent with such studies as Robert J. Barro (2001) and Burnside and Dollar (2000).

If the relationship between aid and growth is nonlinear, then the estimate in the linear specification will be biased. Therefore, in addition, I estimate an equation:

$$growth_{it} = \alpha + \beta \ln(GDP_{it}) + \gamma \ln(aid_{it-1}) + \lambda \ln^2(aid_{it-1}) + \delta * X_{it} + \mu_i + \eta_t + \varepsilon_{it}, \quad (3.5)$$

If after some point aid becomes counterproductive then I expect a negative coefficient λ. It will correspond to the case of decreasing returns to aid. If λ and γ are both positive then aid increases growth rates with no turning point to inefficiency. It corresponds to the case of increasing returns to aid.

Finally, year fixed effects which are included in the regressions correspond to the time-specific factors that influence all countries in the sample the current year. For example, an oil shock during a particular year might have an impact on the growth rate of all countries. Country fixed effects correspond to the unobserved factors that are specific for each country. Such factors might be the demographic and cultural characteristics or any other country-specific variable which has been omitted in the regressions.

4. Data

4.1 Aid and U.N. Security Council membership

In estimating the effect of the Security Council membership on aid flows I follow the data specifications of Kuziemko and Werker (2006), but I extend the panel dataset by adding more countries and years. I use the data of 139 countries which are the members of the United Nations and are classified as not high-income countries by the World Bank in 2007. The countries are not the permanent members of the U.N. Security Council. The summary statistics of all the variables is presented in Appendix in Table 6.

The dataset contains U.S. aid from 1946 to 2006. Data on U.S. aid comes from the database of USAID "Greenbook": "U.S. Overseas Loans and Grants".[7] U.S. aid is constructed to be a sum of the total economic and military loans and grants. I set 1 dollar value to the zero and negative flows of aid for the logarithmic specification, which is consistent with the work of Kuziemko and Werker (2006). They showed that the results are robust to different specifications of the observations with zero and negative aid flows. I convert total aid flows to constant dollars of the year 2000 using U.S. urban CPI.

The main independent variable of interest, Security Council membership, is available for all 139 countries and 61 years in the dataset and is taken from the United Nations website.[8] Around 42% of the countries in the dataset have never served in the Security Council.

[7] Available at the website http://qesdb.cdie.org/gbk/index.html
[8] http://www.un.org/Docs/sc/

Two other independent variables that I control for in the regressions are associated with politics. The first one is the Polity2 score from the "Polity IV" database of Monty G. Marshall and Keith Jaggers of 2007. It takes the value from -10 to 10 and represents the political environment in the country. A score of -10 is associated with perfect dictatorship and 10 with perfect democracy. An average value of the Polity2 score is -1.45, which reflects the fact that the political system of the countries in the dataset is more dictatorial than democratic. The second political variable is associated with the conflicts in the country and comes from the Department of Peace and Conflict Research at Uppsala University and the International Peace Research Institute in Oslo (Gleditsch et al 2002). It captures whether a war with at least 1,000 battle deaths was occurring in the recipient country. Unfortunately, both political variables are not available for all countries and years, so the number of observations diminishes.

Finally, I control for a logarithm of GDP per capita. The GDP per capita data comes from the Penn World Tables and is available only from 1950 till 2004 and not for the whole set of countries.[9] GDP per capita is in constant dollars of the year 2000.

4.2 Growth, aid and U.N. Security Council membership

In order to estimate growth regressions, I divide the years in the sample in 7 periods: 1946-49, 1950-59, 1960-69, 1970-79, 1980-89, 1990-99 and 2000-04. Growth rate data comes from the Penn World Tables and is available from the 1950s. For each period I calculate the averages of the growth rate and aid. I take initial GDP per capita at the beginning of each period.

[9] Available at the website http://pwt.econ.upenn.edu/

In the regression I also control for the inflation and trade openness. The data on trade openness comes from the Penn World Tables and is calculated as a sum of imports and exports divided by real GDP per capita (in constant prices of the year 2000). The data on inflation comes from the World Development Indicators and is in percentage points.[10] I also control for the political variable that indicates the number of wars with at least 1,000 battle deaths occurring in the recipient country. This data comes from the Department of Peace and Conflict Research at Uppsala University and the International Peace Research Institute in Oslo (Gleditsch et al 2002). Finally, I control for the population of the countries in the regressions. This variable comes from the World Development Indicators.

[10] Available at the website http://www.worldbank.org/

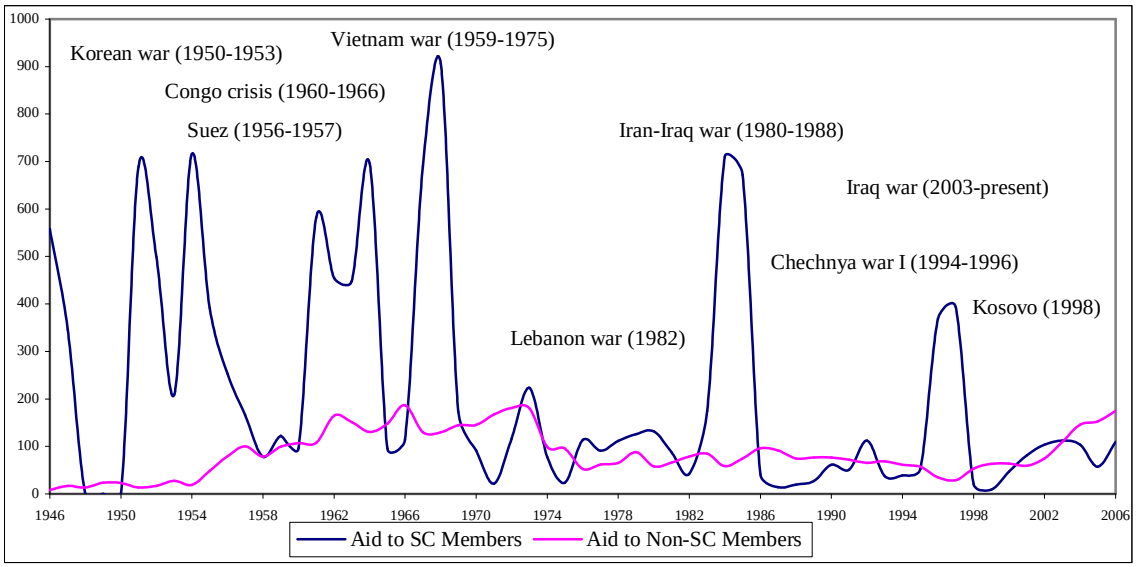
5. Estimation results

5.1 Aid and U.N. Security Council membership

First, it is necessary to check if U.N. Security Council membership is a good IV for foreign aid in order to use it in growth regressions. Earlier I assumed that membership in the Security Council is purely random. Therefore, I first check if there is a strong correlation between foreign aid and membership in the Security Council.

Before presenting the results of the estimation, it is important to look at the general pattern of aid flows from the U.S. and how it distinguishes between members and non-members of the U.N. Security Council. Figure 1 illustrates U.S. total economic and military assistance to Security Council members, i.e. who served on that particular year, and non-members, i.e. who did not serve on that particular year. The numbers on vertical axis represent an average of aid received by members (non-members) in millions of 2000 US $.

Figure 1: U.S. Total Economic and Military Aid to Members and Non-Members of the Security Council



Notes: Vertical axes represent an average value of U.S. total economic and military aid to all the countries in the sample.

The pattern suggests that the U.S. provides more aid to members than non-members of the Security Council. What is also interesting is that the sharp increases in aid correspond to the major conflicts that the U.S. participated in and had strategic interests. However, this pattern might reflect not only the vote-buying behavior of the U.S., but also the size and importance of the country in the political arena might matter. Therefore, the effect of membership on aid is worth investigating.

The first set of results of equations (3.1), (3.2) and (3.3) is presented in Table 1. In column 1 only *SCMember* is included in the regression. The coefficient is upward biased, because it captures not only the "vote-buying" aid but also the effects of omitted variables on aid. In column 2 the fixed effects and the regional time trends are included. The coefficient in a new specification sharply drops, but it still indicates a doubtfully large effect. When I include the full set of controls in the regression, the coefficient almost halves. The result in column 3 indicates that council membership is associated with 50% increase in U.S. aid and this effect is significant at 10% level. The coefficient of determination, the R-squared, suggests that 47% of the sample variation in aid is explained by all the control variables.

What is also interesting is the effect of other control variables on aid. A peaceful country is likely to get foreign aid from the U.S. This may be caused by the fact that in the peaceful country aid would be spent more efficiently and not for the military purposes. Moreover, the U.S. is likely to give more aid to the country with autocratic regime, perhaps in order to spread the democracy. And the country with higher GDP per capita is more likely to receive aid. However, the coefficient on logarithm of GDP per capita might be biased, because of the reverse causality between aid and GDP.

Table 1: U.N. Security Council membership and U.S. aid, OLS estimation

	Dependent variable:								
	Ln (Total aid and loans from US, $2000)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SC Member	5.639	1.197	0.501						
	(0.445)***	(0.283)***	(0.254)*						
On SC, Unimportant year				0.627	0.139	0.092			
				(0.427)	(0.408)	(0.399)			
On SC, Important year				1.619	0.885	0.774			
				(0.369)***	(0.342)**	(0.327)**			
War occurring (>1000 deaths)			-0.62		-0.149	-0.629		-0.123	-0.614
			(0.285)**		(0.271)	(0.285)**		(0.271)	(0.285)**
Polity2 score			-0.037		0.013	-0.037		0.012	-0.037
			(0.017)**		(0.016)	(0.017)**		(0.016)	(0.017)**
Ln (GDP per capita, $2000)			0.525			0.528			-0.51
			(0.309)*			(0.309)*			(0.309)*
One year before election to SC							1.442	0.476	0.016
							(0.382)***	(0.359)	(0.355)
Year of election to SC							1.706	0.796	0.525
							(0.385)***	(0.36)**	(0.352)
First year of serving on SC							1.513	0.613	0.567
							(0.387)***	(0.361)*	(0.349)
Second year of serving on SC							1.553	0.764	0.531
							(0.388)***	(0.362)**	(0.349)
First year after finishing SC term							0.993	0.48	0.348
							(0.389)**	(0.364)	(0.351)
Second year after finishing SC term							1.004	0.515	0.189
							(0.4)**	(0.376)	(0.361)
Country and year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region time trends	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8479	8479	3539	8479	4375	3539	8479	4375	3539
R-squared	0.02	0.64	0.47	0.64	0.47	0.47	0.64	0.47	0.47

Notes: Robust Standard Errors are presented in parentheses. ***, **, * symbols indicate the statistical significance at 1%, 5% and 10% levels respectively.

Columns 4, 5 and 6 correspond to the specification when the importance of council decisions is interacted with the membership term. Like in column 2, column 4 shows the high values of the coefficients without the full set of the control variables. When all the control variables are included in the regression, although it reduces the sample, the results suggest that during the politically important years the increase in U.S. aid is highly significant. The point estimate indicates that the countries that were serving during the important years received 77% more aid from the U.S. And during the relatively not important years the council members received no additional U.S. aid.

Finally, the last three columns in Table 1 correspond to the case when I examine the variation in aid during the term, as well as before and after the term. Without the full set of control variables, in column 7, all the point estimates are highly significant. The coefficients suggest that in the year prior the election and two years after the term aid is not higher than during the term. Aid level is the highest in the year of election and it is slightly less during the term. These results suggest that the aid increases are associated with the council election and membership. When the political controls are included, the point estimates, reported in column 7, are reduced in size, but the coefficients which correspond to the years of election and membership remain statistically significant. In column 8 I include the logarithm of GDP per capita, which reduces the sample by one fifth and all the coefficients on membership become insignificant. The inclusion of all the control variables reduces the sample by over than half and, consequently, the significance levels drop.

Overall, the results in Table 1 indicate that a country which serves a two-year term in the U.N. Security Council receives more foreign aid from the U.S., especially during a key diplomatic year. This adds more credibility to the hypothesis that being a member of the Security Council a country "sells" its votes to the U.S. According to the results and the

assumption that membership is purely random, *SCMember* is a good IV for foreign aid and it can be used in the growth regressions.

5.2 Growth, aid and U.N. Security Council membership

Table 2 presents the results of OLS estimation of the growth regressions of specification given by equations (3.4) and (3.5). The dependent variable is the average growth rate of GDP per capita of a country over the period. In columns 1 and 2 I first look at the effect of the logarithm of initial GDP per capita. Column 2 also includes the country and year fixed effects. Without the fixed effects the coefficient on initial GDP per capita is positive and insignificant, which does not support the hypothesis of conditional convergence. The R-squared in column 1 also suggests that the independent variable explains only 0.1% of sample variation in growth. The coefficient on initial GDP per capita is upward biased, because it includes the effects of the omitted variables. With the inclusion of the fixed effects the coefficient on initial GDP per capita becomes negative and highly significant. It implies a conditional rate of convergence of an average of 2.8% per year. In other words, a 10% increase in initial GDP per capita is associated with a -0.28% decrease in the average growth rate. This supports the evidence in economic literature that the countries with lower income levels tend to "catch up" towards the income levels of the rich countries.

Table 2: Impact of U.S. aid on growth in low- and middle-income countries, OLS estimation

	Dependent variable: Average growth rate of GDP per capita (in %)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln(initial GDP)	0.082	-2.828	0.08	-3.089	-3.074	-2.566	-2.55
	(0.152)	(0.441)***	(0.16)	(0.453)***	(0.492)***	(0.545)***	(0.547)***
Ln(aid/population)			-0.011	0.057	0.038	0.037	0.151
(in previous decade)			(0.021)	(0.027)**	(0.028)	(0.031)	(0.281)
Ln^2(aid/population)							0.003
(in previous decade)							(0.007)
SC Member (in previous decade)							
Inflation					-0.003	-0.002	-0.002
					(0.0001)***	(0.001)***	(0.001)***
Openness					0.014	0.015	0.015
					(0.005)***	(0.005)***	(0.005)***
War						-0.195	-0.19
						(0.093)**	(0.094)**
Country and year fixed effects	No	Yes	No	Yes	Yes	Yes	Yes
Observations	582	582	542	542	490	377	377
R-squared	0.001	0.41	0.001	0.41	0.52	0.52	0.52

Notes: Robust Standard Errors are presented in parentheses. ***, **, * symbols indicate the statistical significance at 1%, 5% and 10% levels respectively.

Columns 3 and 4 report the same specification as columns 1 and 2 correspondingly but with the inclusion of the main variable of interest, aid. As in column 1, column 3 shows the biased and inconsistent estimators, because the fixed effects are not controlled for. In column 4 the coefficient on aid is positive and significant at 5% level. However, the effect is very small. It implies that the 10% increase in aid is associated with an increase of a 0.006 percentage point in the growth rate.

In columns 6 and 7 I gradually include other control variables. As a result, the coefficient on aid decreases and loses its significance. All other control variables are highly significant. Unsurprisingly, inflation and war conflicts are associated with a decrease and trade openness with an increase in economic growth. In column 7 I check if the effect of aid on growth is non-linear. But the coefficients on aid and aid-squared are both insignificant. However, since when I estimate the coefficient on aid I cannot hold aid-squared term constant because both variables are dependent, it is important to check them for joint

significance. The F-test for joint significance reports the F-statistic equal to 1.1. This number is well under the 10% critical value in the F-distribution with 2 and 370 degrees of freedom[11], and so I cannot reject the hypothesis that aid and aid-squared have no effect on growth.

The results in Table 2 suggest that there is no effect of U.S. aid on the growth rates.[12] However, OLS estimation does not take into account the endogeneity of aid. If the U.S. is motivated to give more aid to the countries with lower growth then the coefficients on aid are biased. Consequently, I present the 2SLS estimation results in Table 3. Columns 1-4 follow the specifications of columns 3-6 in Table 2. The only difference is that in Table 3 I use *SCMember* variable as an IV for aid. The coefficients in column 1 are upward biased as they include the effects of country- and time-specific characteristics. In column 2 the coefficient on aid is negative and insignificant. When all the set of control variables is included in the regression, the coefficient on aid becomes positive but remains insignificant. If the U.S. gives more financial assistance to the countries that are doing "well", than the OLS estimate in column 6 in Table 2 would be upward biased and the IV estimate should correct for it, therefore, result in a lower value. However, the 2SLS coefficient is slightly larger than the coefficient on aid in OLS estimation with all the other control variables included. This suggests that IV estimate corrects for the downward bias of the OLS estimate: the U.S. tends to give more aid to the countries that are poor. The values of the coefficients on other control variables and their significance levels remain the same as in OLS estimation.

[11] The 10% critical value of the F-distribution with 2 and 370 degrees of freedom is equal to 2.30.
[12] Figure 2 illustrates the trend lines of average aid from the U.S. and average growth of GDP per capita for all countries in the sample.

Table 3: Impact of U.S. aid on growth in low- and middle-income countries, 2SLS estimation

	Dependent variable: Average growth rate of GDP per capita (in %)				
	(1)	(2)	(3)	(4)	(5)
Ln(initial GDP)	0.082	-3.114	-3.011	-2.396	-2.487
	(0.162)	(0.474)***	(0.662)***	(0.9)***	(0.914)***
Ln(aid/population) (in previous decade)	-0.088	-0.102	0.07	0.084	-1.223
	(0.089)	(0.279)	(0.225)	(0.212)	(7.762)
Ln^2(aid/population) (in previous decade)					-0.033
					(0.197)
Inflation			-0.003	-0.002	-0.002
			(0.001)***	(0.001)***	(0.0008)**
Openness			0.014	0.014	0.011
			(0.005)***	(0.005)***	(0.021)
War				-0.189	-0.245
				(0.097)*	(0.338)
Country and year fixed effects	No	Yes	Yes	Yes	Yes
Observations	542	542	490	377	377
R-squared	0	0.4	0.52	0.51	0.46

Notes: Robust Standard Errors are presented in parentheses. ***, **, * symbols indicate the statistical significance at 1%, 5% and 10% levels respectively.

Earlier the estimations showed that the effect of Security Council membership is higher if a country serves during a key diplomatic year. I use *SCMember*Level_of_Importance* interaction term as an IV in order to estimate non-linear equation (3.5). Column 5 in Table 3 shows the results of the 2SLS estimation. The coefficients on aid and aid-squared remain statistically insignificant as in OLS estimation. However, the magnitudes of the coefficients as well as the standard errors are much higher.

The results in Table 3 suggest that there is no effect of the U.S. foreign aid on growth rates in low- and middle-income countries. However, I assumed that membership in the Security Council is purely random. If we suppose this is not the case and the countries that are doing "well" are more likely to get into the Security Council, then the 2SLS estimate would be upward biased.

Concluding remarks

The main objective of this thesis was to re-investigate the long-standing question of aid effectiveness. In panel data estimation, the results showed that there is no effect of U.S. aid on growth in low- and middle-income countries. This central conclusion is robust even if U.N. Security Council membership is used as an instrumental variable for aid which corrects for the bias in a standard aid and growth relationship. There are several important implications of the current findings.

First, the estimation showed that the U.S. allocates more aid to the members of the Security Council than to the non-members, especially when a country serves during a key diplomatic year. This result suggests that the political purposes of U.S. aid dominate and a government of a country that receives financial support does not necessarily spend this money efficiently. It may allocate the funds into military sector with the main purpose of military interventions or to other consumption priorities instead of focusing on the country's development and growth.

Secondly, there is still much debate and not enough knowledge in the economic literature what causes growth and reduces poverty. Therefore, it remains difficult to investigate the relationship between growth and other macroeconomic variables, especially in panel data estimation. For example, as Riddell (2007) points out, there exist other country-specific variables that change over time and which are difficult to trace, such as "recipient's commitment and ownership of the national and sectoral strategies, into which aid funds are inserted" (p. 225). What is clear from the economic literature and what this thesis partly

supported is that trade openness and good institutions and policies increase growth rates, whereas inflation, war conflicts and corruption have an adverse effect. There also exist other constraints that became more discussed in recent economic literature and which should be taken into account when analyzing aid and growth relationship. Such constraints are Dutch disease effect, "fungibility" problem and limited capacity of a country and its government to absorb more and more aid.

Thirdly, this research was focused only on the examining the effect of bilateral aid which is provided directly by the USAID and is more likely to be strategically oriented than the multilateral aid from the international organizations such as the World Bank, the United Nations or the International Monetary Fund. The decisions on multilateral aid are made collectively by all the donors. Therefore, it is viewed as less politically driven and allocated more according to the needs of the recipients. (Riddell, 2007)

Finally, aid is initially created to increase the welfare of poor countries. So the primary question that should be addressed is how to make aid allocation more efficient and how to reduce the influence of the factors that constrain aid's impact. Even if the results of this thesis showed that there is no impact of aid on growth, it does not mean that aid would not be beneficial for the promotion of sustainable economic development and growth in poor countries in the future. It means that the ways how donors allocate aid and how recipient's government expends it should be rethought.

Overall, aid seems to be a part of the solution in order to raise growth, but not a panacea. Put well by Easterly (2003), "poor nations include an incredible variety of institutions, cultures and histories…The idea of aggregating all this diversity into a 'developing world' that will 'take off' with foreign aid is a heroic simplification." (p.40)

Appendix

Table 4: Major political events 1946-2004

Year	Political event
1946	First year of the United Nations
1948	Marshall Plan
1950-1953	Korean war
1956-1957	Suez crisis
1959	First year of Vietnam war
1960-1966	Congo crisis
1967, 1973	Israel-Arab wars
1979	First year of the Soviet war in Afghanistan
1980-1986	First 6 years of Iran-Iraq war
1982	Lebanon war
1990-1991	Iraq war I
1991	Peacekeeping operations in former Yugoslavia
1994-1995	First 2 years of war in Chechnya[13]
1998-1999	Kosovo
2001-2002	First 2 years of war in Afghanistan (US/NATO)
2003-2004	First 2 years of war in Iraq

Table 5:U.N. Security Council membership and U.S. aid, OLS estimation, another specification of year importance

	Dependent variable: Ln (Total aid and loans from US, $2000 US)		
	(1)	(2)	(3)
SC Member			
On SC, Unimportant year	0.688	0.18	0.144
	(0.507)	(0.481)	(0.438)
On SC, Somewhat important year[14]	1.683	1.108	0.718
	(0.498)***	(0.472)**	(0.435)*
On SC, Important year	1.204	0.464	0.635
	(0.447)***	(0.414)	(0.438)
War occurring (>1000 deaths)		-0.136	-0.613
		(0.271)	(0.285)**
Polity2 score		0.013	-0.037
		(0.016)	(0.017)**
Ln (GDP per capita, $2000)			0.531
			(0.309)*
Country and year fixed effects	Yes	Yes	Yes
Regional time trends	Yes	Yes	Yes
Observations	8479	4375	3539
R-squared	0.64	0.47	0.47

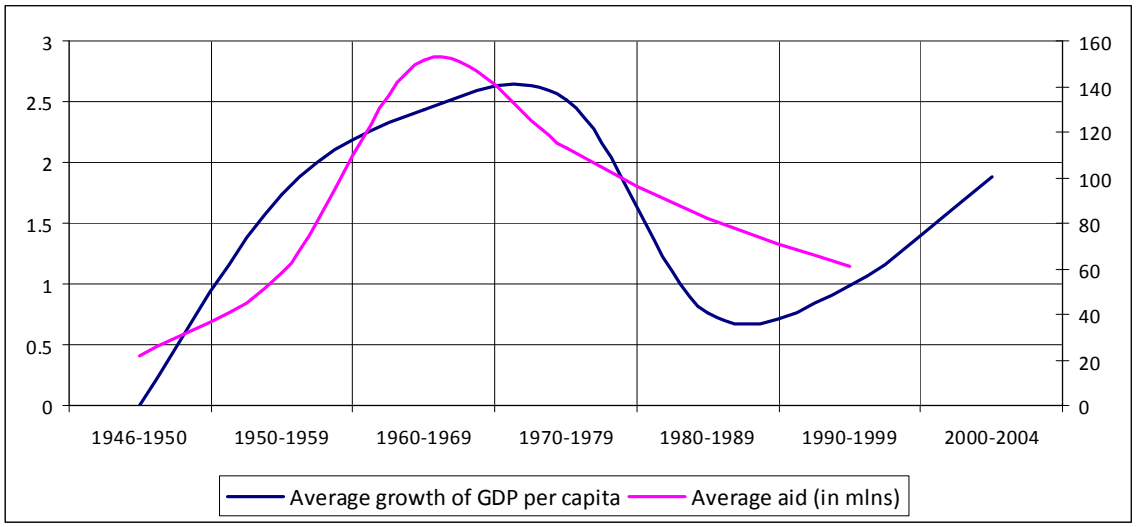
[13]

[14] Important years include 1946-1952, 1954-1956, 1958, 1960-1961, 1964-1965, 1968, 1982, 1990-1994, 1998, 2003-2006. Somewhat important years include 1953, 1957, 1962-1963, 1966-1967, 1969, 1971, 1973, 1975-1976, 1979-1980, 1985, 1988, 1995-1996 and 1999.

Table 6: Summary Statistics

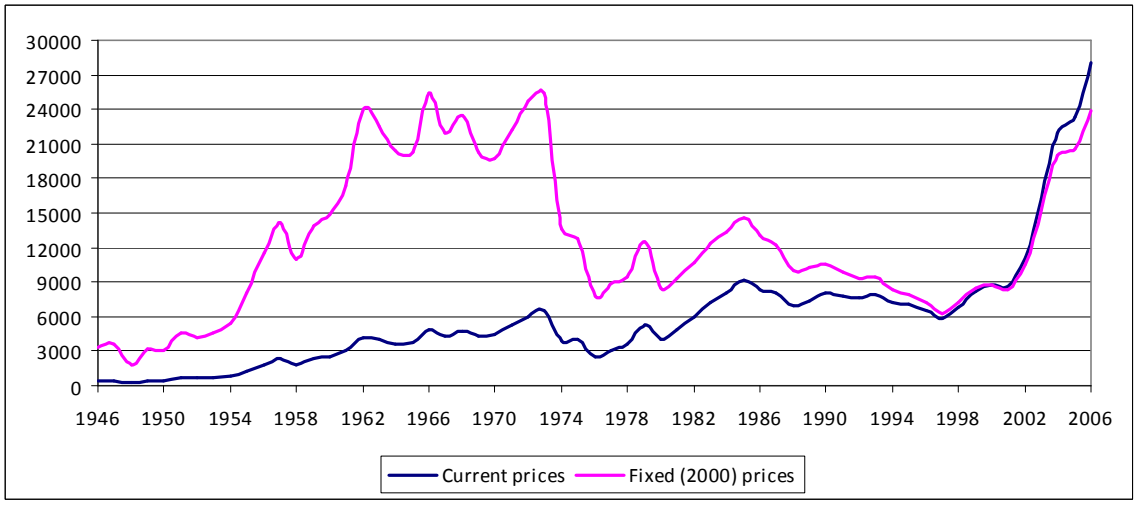
Variable	Observations	Mean	Standard Deviation
Average growth rate of real GDP per capita	582	1.65	3.03
Total aid and loans from US, $2000, in millions	8479	90.37	457.94
Ln (Total aid and loans from US, $2000, in millions)	8479	-3.39	8.36
Average aid received in previous decade in millions in 2000$ US	834	81.2	352.1
Ln(Average aid received in previous decade in millions in 2000$ US)	834	-3.34	8.3
SC Member	8479	0.04	0.2
SC Member in previous decade	834	0.193	0.395
GDP per capita, $2000 US	5003	3221.4	2646.28
Ln (GDP per capita in $2000 US)	5003	7.75	0.83
Initial GDP per capita in $2000 US	586	3199.5	2623
Ln(Initial GDP per capita $2000 US)	586	7.745	0.833
War occurring (>1000 deaths)	5795	0.07	0.26
Polity2 score	5354	-1.45	6.68
Inflation	546	51.88	237.7
Openness	593	72.97	49.58
War	582	0.7	1.9
Population	670	16723206	60212649

Figure 2: The trend lines of average aid from the U.S. and average growth of GDP per capita for all countries in the sample, 1946-2004



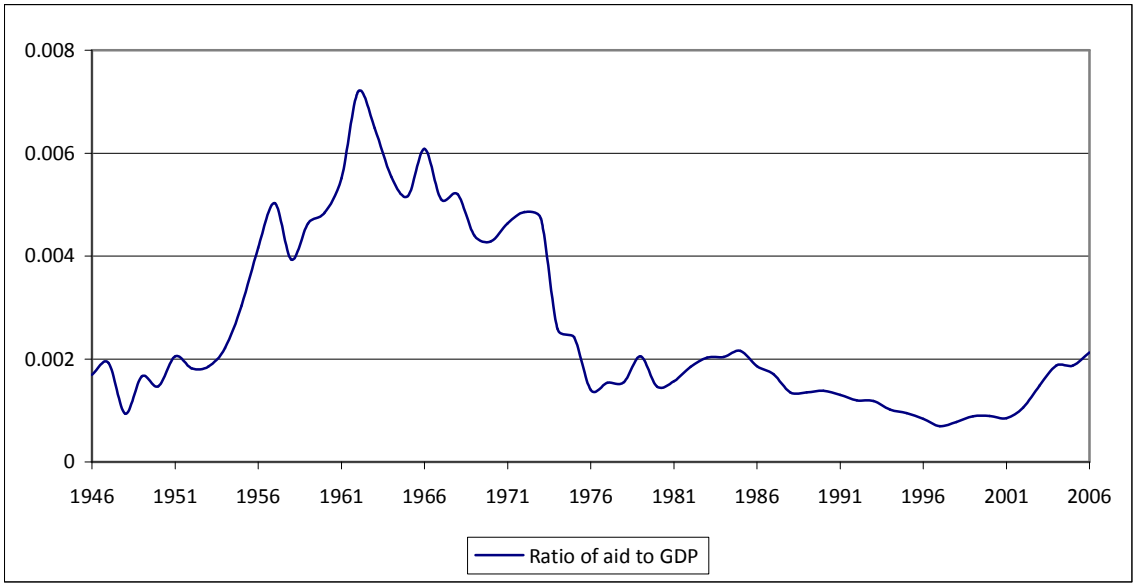
Notes: The left vertical axes represent the average growth rate of GDP per capita (in percents), the right vertical axes represent average U.S. aid (in millions, fixed US$ of the year 2000) for all countries in the sample.

Figure 3: Total U.S. aid in fixed (2000) and current prices, 1946-2006



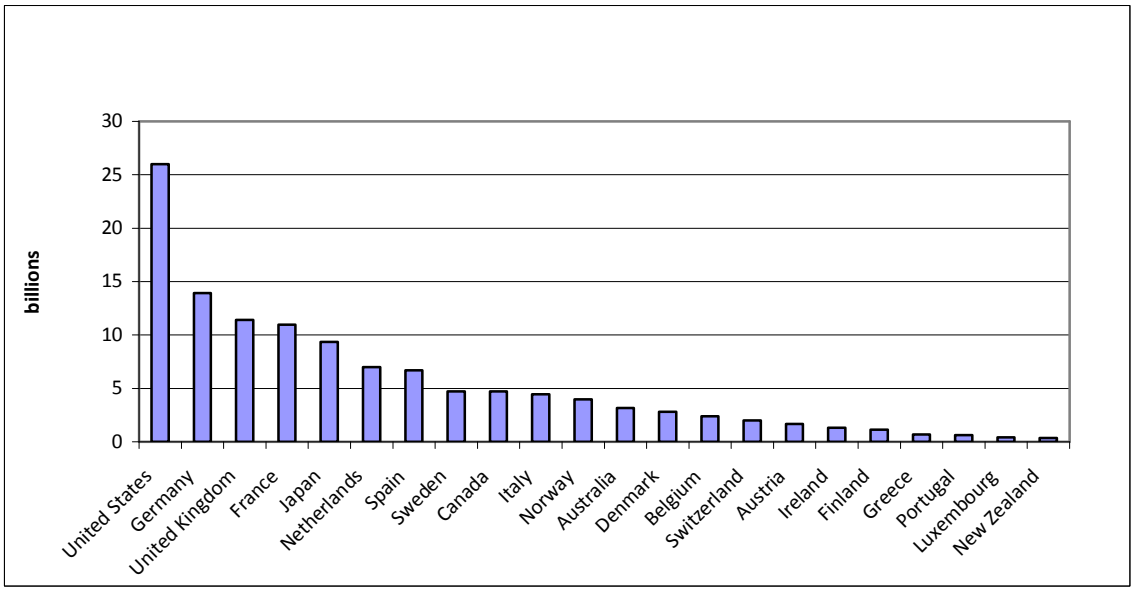
Notes: The vertical axes represent the U.S. total economic and military aid (in millions).

Figure 4: Ratio of total U.S. aid to U.S. GDP, 1946-2006



Notes: The vertical axes represent the ratio of U.S. total economic and military aid to GDP.

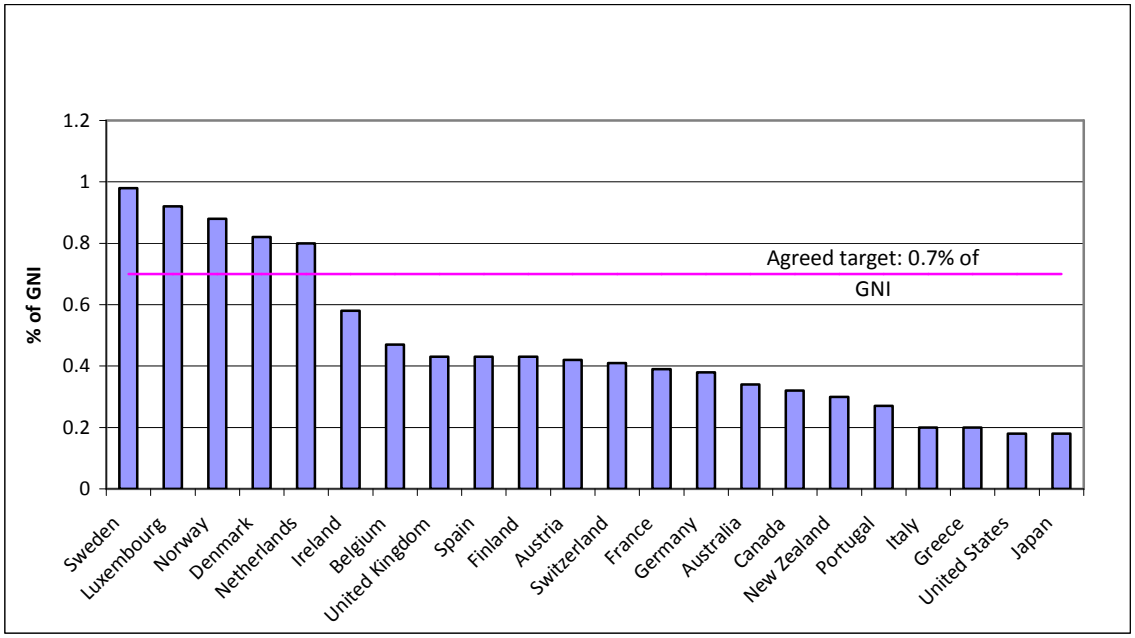
Figure 5: Net ODA in 2008 current prices



Notes: The data comes from the OECD Development Statistics.[15]

[15] Available at the website http://stats.oecd.org/qwids/

Figure 6: Net ODA 2008 as percent of GNI



Notes: The data comes from the OECD Development Statistics.

Table 7: Top ten recipients of U.S. economic and military assistance, 2007

Economic assistance		Military assistance	
Iraq	4,049.77	Iraq	4,143.06
Afghanistan	2,173.60	Afghanistan	3,642.19
Russia	1,481.25	Israel	2,340.03
Sudan	926.39	Egypt	1,301.20
Egypt	670.92	Pakistan	311.97
Pakistan	664.57	Sudan	254.1
Ghana	619.48	Jordan	210.81
Mali	535.15	Russia	112.4
Kenya	522.34	Colombia	87.1
El Salvador	503.86	Liberia	55.53

Notes: The numbers are in millions of $US in 2007 current prices. The data comes from the USAID.

References

Alesina, Alberto and David Dollar. 2000. "Who Gives Aid to Whom and Why?" *Journal of Economic Growth.* 5 (1): 33-63.

Barro, Robert J. 2001. "Determinants of Economic Growth: a cross-country empirical study". *MIT Press.*

Boone, Peter. 1996. "Politics and the Effectiveness of Foreign Aid." *European Economic Review.* 40, 289-329.

Browne, Stephen. 2006. "Aid & Influence: do Donors Help or Hinder?" *UK Cromwell Press.*

Collier, Peter. 2007. "The Bottom Billion: Why the Poorest Countries are failing and What Can Be Done about It?" *Oxford University Press.*

Doucouliagos, Hristos and Martin Paldam. 2007. "The Aid Effective Literature: the Sad Results of 40 Years of Research" *University of Aarhus, Department of Economics.* Working paper.

Easterly, William. 2003. "Can Foreign Aid buy Growth?" *Journal of Economic Perspectives.*

Easterly, William, Ross Levine and David Roodman. 2003. "New Data, New Doubts: a Comment on Burnside and Dollar's 'Aid, Policies and Growth' (2000)" *American Economic Review.*

Erixon, Frederic. 2005. "Aid and Development: Will It Work This Time?" *London: International Policy Network.*

Gleditsch, Nils Peter, Peter Wallensteen, Mikael Ericsson, Margareta Sollenberg and Havard Strand. 2002. "Armed Conflict 1946-2001: a New Dataset." *Journal of Peace Research.* 39 (5): 615-637.

Hansen, Henrik and Finn Tarp. 2000. "Aid Effectiveness Disputed". *Journal of International Development*. 12, 375-398.

Hansen, Henrik and Finn Tarp. 2001. "Aid and Growth Regressions". *Journal of Development Economics*. 64.2: 547-70.

Kuziemko, Ilyana and Eric Werker. 2006. "How Much is a Seat on the Security Council Worth? Foreign Aid and Bribery at the United Nations." *Journal of Political Economy*.

Marshall, Monty G. and Keith Jaggers. 2007. *Polity IV Dataset*. University of Maryland.

Quibria, M.G. 2004. "Development Effectiveness: What does Recent Research tell us?" *Asian Development Bank*. Working paper.

Rajan, Raghuram G. and Arvind Subramanian. 2005. "Aid and Growth: What does the Cross-Country Evidence Really Show?" *International Monetary Fund*. Working Paper.

Renfrew, Barry. 2003. "France battles U.S. to line up U.N. votes." *Associated Press*. 1 Mar 2003.

Riddell, Roger C. 2007. "Does Foreign Aid Really Work?" *Oxford University Press*.

Tamura, Fumiko and Takuma Kunieda. 2005. "Vote-Buying Behavior in the Security Council: Theory and Evidence from U.S. Foreign Aid." Manuscript, Department of Economics, Brown University.

USAID (United States Agency for International Development). 2004. "US Foreign Aid: Meeting the Challenges of the Twenty-First Century." *Washington, DC: USAID*.