The Relationship between Foreign Aid and Human Development: An Empirical Investigation for a Set of Countries of the Former Soviet Union

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Abstract

The main goal of foreign aid in promoting economic growth has been under question. With the recent change of concentrating from economic to human development, analysis of the impact of aid on human welfare is necessary. This paper aims at investigating the relationship between official development assistance and human development in the countries of Former Soviet Union. My results indicate that foreign aid has a weak positive impact on the human development depending on the model specification and the estimation method. Therefore, further research with better data and theoretical foundation is necessary in order to improve the understanding the role of official development assistance in human development.

Introduction

At the Millennium Summit in September 2000, the biggest assembly of world leaders in history adopted the UN Millennium Declaration, pledging their nations to a new international cooperation to eradicate poverty and establishing a number of time-bound objectives to be reached by 2015 that have become known as the Millennium Development Goals. The Millennium Development Goals are global, time-bound and quantified objectives addressing harsh poverty in many aspects including hunger, disease, lack of access to shelter and clean water, and at the same time promoting gender equality, educational attainment, and environmental sustainability. These goals also reflect some basic human rights, such as the rights of each individual to obtain education, to have shelter and access to health and security. The world leaders present at the Summit agreed to commit to achieve these goals through the increase the financial assistance to countries in need (United Nations Development Programme, 2005). Therefore, donor community has more than tripled their contribution to the cause by increasing international aid to developing countries from 26, 195.05 Million U.S. Dollars (USD) in 1980 to USD 119,759.48M in 2008 (OECD, 2009).

With growing intensity given to international financial aid to developing countries, an analysis of its effectiveness is timely. In trying to evaluate the impact of official development assistance, most empirical studies concentrate on the effectiveness of foreign aid on GDP growth and other macroeconomic indicators, such as investment or public goods in the recipient countries, suggesting that the ultimate purpose of the foreign aid is to narrow the saving-investment gap that these developing countries face. At the same time, there has been little research conducted to assess the effectiveness of international aid on the change of human development indicators. This matter is, however, of great importance and is pertinent

to contemporary international goals given that the objectives announced by the donor community have changed from rigorous industrialization agendas advocated in the 1950s to the current objectives of eradicating poverty as reflected in the Millennium Development Goals. If the donors' objective is ultimately set to achieve these pledged goals, then evaluating whether their financial aid to these countries is effective should be examined against pertinent indicators such as the human development indicator.

The main purpose of this paper is to investigate the extent to which the official development assistance has resulted in improvements of human development as indicated by UNDP human development indicator among nine countries of former Soviet Union block. The aim is to improve the understanding of the role of foreign aid in human development and, therefore, provide useful guidelines for major stakeholders, including donors and the governments of the recipient countries for designing aid systems and increasing their effectiveness in achieving the Millennium Development Goals.

This paper proceeds as follows. Section 2 studies the human development indicator, analyses its measurement and discusses foreign aid given to the studied countries. Related empirical research on the effectiveness of the official development assistance is discussed in section 3. Section 4 describes empirical methodology and the data employed to conduct the study, while section 5 presents the results obtained from 9 countries of Former Soviet Union during the period of 1995-2006. Finally, section 6 concludes.

2. Human Development Indicator and Official Development Assistance

In 1990, with the launch of its first annual Human Development Report (HDR) publication and the introduction of the Human Development Index (HDI) the United Nations

Development Program has dramatically changed the landscape of development theory, measurement strategies and policy implications. HDR 1990 described the notion of "human development" as a progress towards greater human well - being, and presented country-level data for a number of development indicators. The UNDP's creation of HDR has not only improved the understanding of the development concept itself, but also enlarged both the availability of the measurement and analytical tools used by governments, NGOs, and researchers.

HDI has been the main feature of the HDRs for nearly 19 years, and the latest edition, HDR 2007/08, includes HDI rankings for 179 countries. It provides an alternative to the conventional practice of assessing a nation's progress in development based on GDP per capita. The Human Development Index conceptualizes Amartya Sen's "capabilities" approach to understanding human welfare. He stresses the significance of ends (acceptable standards of living, for example) over means (GDP per capita) (Sen, 1985). HDI formulation, therefore, consists of three proxies for human development ends that enable individuals to achieve their desired level of well-being: access to health, education, and goods.

2.1. HDI measurement

In HDI, elements for literacy, school enrolment, life expectancy and income indices are combined together into a single index. It can be utilized to compare the level of human welfare among countries or simply to track a country's development over time. Education is depicted by literacy (LIT) and school enrolment (ENR), and combined in weighted average as education (E), health (H) by life expectancy (LE), and the standards of living by GDP per

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capita (Y). The value for each of these elements is then converted into an index using a normalization formula.

$$LIT\ Index_i = \frac{LIT_i - 0\%}{100\%} \quad (1)$$

$$ENR\ Index_i = \frac{ENR_i - 0\%}{100\%} \quad (2)$$

$$E\ Index_i = 2/3 LIT\ Index_i + 1/3 ENR\ Index_i \quad (3)$$

$$H\ Index_i = \frac{LE_i - 25\,years}{85\,years - 25\,years} \quad (4)$$

$$Y\ Index_i = \frac{\ln(Y_i) - \ln(\$100)}{\ln(\$40,000) - \ln(\$100)} \quad (5)$$

Per capita GDPs that are used in the income index calculation are in the USD and are purchasing power parity (PPP) adjusted to remove the differences in price levels across countries. It is a well-known fact that prices in low-income countries are lower; therefore raw calculations of income per capita may not reflect the true purchasing power of these countries (Samuelson, 1994). In addition, income is capped at USD 40,000 as reflected in average income per capita in developed nations and natural logarithms are calculated for the actual, minimum and maximum values to take into consideration the diminishing marginal utility of income.

Finally, education, health and income indices are averaged together to produce HDI, with each given an equal weight:

$$HDI = \frac{E\ Index + H\ Index + Y\ Index}{3} \quad (6)$$

Given various criticism of the index that will be discussed below the computation used in HDI have been modified over the years and what is described above is the latest formula, which has remained unaltered since 1999.

2.2. Criticism of HDI

Even though, HDI is thought to be powerful in focusing public attention by its simplicity (Streeten, 1994), it is not without its own critics. The summary of some prominent critics is nicely portrayed in Srinivasan (1994:241) who states:

> *[T]he HDI is conceptually weak and empirically unsound, involving serious problems of noncomparability over time and space, measurement errors, and biases. Meaningful inferences about the process of development and performance as well as policy implications could hardly be drawn from variations in HDI.*

Generally, HDI is criticized based on two broad categories: poor data and wrong selection of indicators. Each of these categories is discussed further.

Poor Data

Many critics point to the poor quality of data used in calculating HDI, especially in terms of the completeness of data collection and the frequency of measurement errors. Srinivasan (1994), for example, argues that the census data drawn upon to calculate the index are inaccurate and therefore unreliable due to the fact that the data is collected infrequently and lacks complete coverage within countries. Aturupane et al (1994) address a number of issues associated with measurement errors, such as different definitions of key HDI

components, especially that of literacy, and the lack of the appropriate tool to measure the quality of educational institutions across countries.

Incorrect Indicators

This category of criticism is concerned about the choice of elements included in HDI formulation, and takes two closely related forms. First, HDI does not include important indicators explaining progress made towards better human welfare, such as the extent of civil and political liberties, measurement of inequality within society that further defines better access to health care, educational opportunities and natural resources, etc. Second, factors included in the current HDI formulation, in which elements are combined utilizing a simple, un-weighted mean method, are incorrect. This is analogous to "adding apples and oranges" (Hopkins, 1991:1471).

Despite its criticism, Human Development Index remains the benchmark for alternative method of measuring progress made in human welfare. In moving away from the traditional indicators of economic development, such as income per capita, the HDI have accomplished a major re-orientation of focal point by incorporating into the limelight the neglected but crucial aspects of survival and basic education as an important part of the not only economic but also human development.

2.3 HDI in Countries under Analysis

Political, economic and social transition of Former Soviet Union countries severely affected people's human development and human security. However, because Central Asian countries, selected countries of the Caucasus region and Moldova were among the poorest and most vulnerable parts of the Soviet Union, the human impact was arguably more severe

in these regions than elsewhere in the Former Soviet Union. During the initial period of independence from 1991 to 1995, the economic and social indicators for each of these countries dropped significantly. National poverty and unemployment rates increased, total output decreased and social and educational expenditures suffered a severe decline. Due to the substantial difference in economic and social policies, human development conditions significantly diverged.

Graph 1. HDI for selected countries

The achievements of these countries in human development are classified as medium-human development, except for Kazakhstan, which has been moved to the high-human development category in 2006. Each of these countries, as can be seen from the Graph 1 had a higher HDI in 2006 relative to that of 1990's displaying improvements in human

development throughout a decade. Tajikistan ranked last among the Former Soviet Union countries (Table 1), but due to its relatively high education and health achievements compared to the poorest developing countries, its ranking is significantly higher than it would have been if ranked purely on the basis of per capita income.

Furthermore, all of nine countries studied have a higher education and state of health indicators than one would expect given their relative level of economic development. For countries such as Kyrgyzstan, Moldova and Tajikistan that are endowed with few natural resources, human capital is a major asset that could be crucial for economic prosperity. However, this advantage is highly jeopardized due to two main reasons. First, there has been constant decline in public spending on education leading to lower education standards. Second, due to political and economic turmoil, most of these countries were faced with a continuing emigration of scientist, engineers, doctors and other professionals to Russia, Turkey, the United States and Europe during 1990 to 1997.

Table 1. HDI ranking in 2006

Country	Rank	HDI	Population living on $1.25/day (%)
Kazakhstan	71	.807	3.1
Armenia	83	.777	10.6
Georgia	93	.763	13.4
Azerbaijan	97	.758	<2
Turkmenistan	108	.728	24.8
Moldova	113	.719	8.1
Uzbekistan	119	.701	46.3
Kyrgyzstan	122	.694	21.8
Tajikistan	124	.684	21.5

Source: Human Development Report, 2007/2008, UNDP

As for the health indicator, Central Asian, Caucasian countries and Moldova experienced a decrease in life expectancy at birth since 1995 (Graph 2) caused by complete suspension of national health coverage and continuing decrease in public expenditures on social infrastructure. However, infant mortality rates were much lower in 2006 compared to its levels in 1995 (Graph 3). The main reasons behind this phenomenon are improved literacy rates for women and their greater participation in secondary and post-secondary educational establishments.

Graph 2. Life expectancy at birth
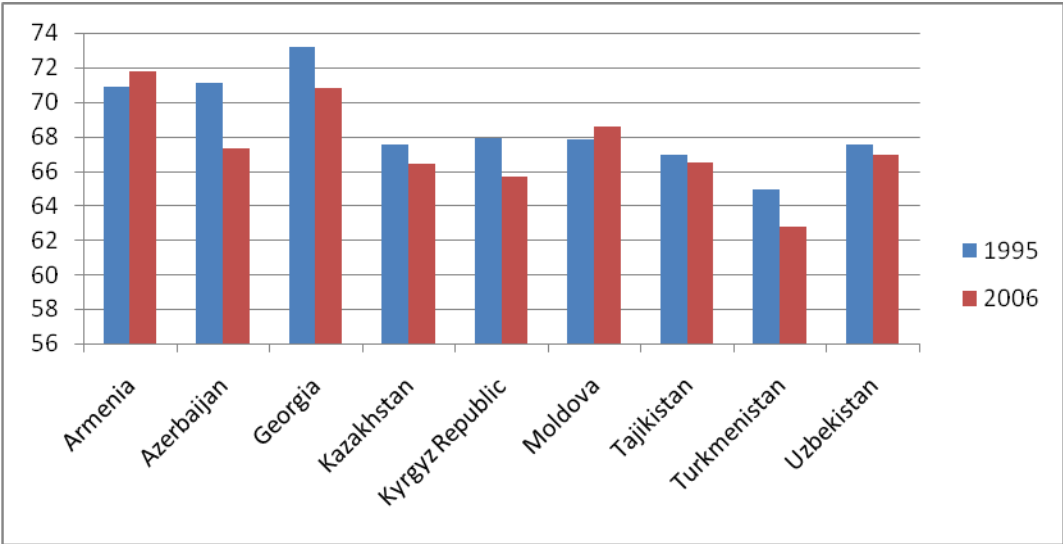
Despite their relatively high level of education in the 1990's and improved health indicators (as reflected in the decrease of infant mortality rate) compared to countries with similar economic status, the Central Asian countries and Moldova were still poor next to other former Soviet countries. As it was mentioned earlier, through the early 1990's, as output declined and real wages dropped, a difficult time of inequality, poverty and deprivation rose among people throughout the region. Until recently, all countries of Former

Soviet Union have achieved a relatively high economic growth rates since 1999, caused by a combination of recovery, reforms, high mineral prices and the positive spill-over effects of rapid economic growth in neighbouring countries, especially Russia.

Graph 3. Infant Mortality Rates
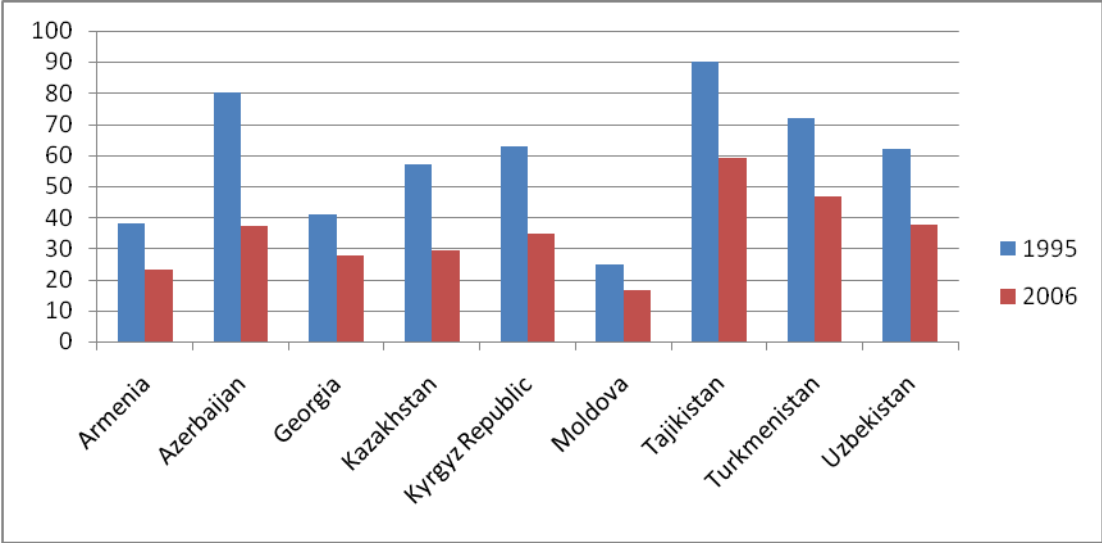
Nevertheless, following a number of years of economic recovery, poverty rates remained high in most Central Asian and Caucasian countries in 2006, as measured by poverty indicators, such as the share of population living below 1.25 per day (Table 1). In addition, increased income inequality, as measured by the Gini coefficient, has significantly contributed to the higher poverty levels in these economies (UNDP, 2005).

2.4. Foreign Aid

Foreign aid is the vital component of the economy for some countries of the Former Soviet Union, and a source of political acrimony for others. In all of the studied countries, official development assistance constitutes the main source of external income, ranging from

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13% to 40% of GDP (OECD, 2009). The majority of this aid is given for the purpose of achieving the Millennium Development Goals. However, Central Asia's strategic geographic and political importance has risen during the United States' efforts to implement a surge in Afghanistan. Over the past few years the United States, the main donor to all nine countries under study, has gathered a Northern supply network involving all five Central Asian states in an effort to accelerate the flow of materials needed by the coalition forces to continue their military operations.

In spite of the above-mentioned financial initiatives, Central Asia remains alarmingly unstable; a lack of economic opportunity and weak democratic institutions cultivate conditions where corruption is endemic and where religious extremism and drug trafficking can thrive. Tajikistan, and to a lesser extent Kyrgyzstan, are seen as the weakest links in the supply chain, mainly due to declining economic conditions. The U.S. government has been increasing its aid packages for Kyrgyzstan and Tajikistan in order to stabilize those countries and enhance the U.S. efforts to defeat Taliban insurgency in Afghanistan. Economic aid to Kyrgyzstan will rise from USD 24.4 Million in 2009 to USD 41.5 Million. As for Tajikistan, official assistance will increase from USD 25.2 Million to USD 46.5 Million in 2009. The increase in financial assistance is designed to help Tajikistan prevent a slide into a failed state status. In Tajikistan, the official assistance is mainly focused on alleviating chronic winter electricity and food shortages that threaten Tajikistan's stability. The aid received by Turkmenistan has also been increasing in the past few years, albeit remaining relatively small in scale. Economic aid will increase from USD 7 Million to USD 13 Million in 2009, while Foreign Military Financing money is planned to rise tenfold, from USD 150 Thousand to USD 1.5 Million. Furthermore, the U.S. aid programs in all Central Asian countries are

aimed at strengthening border security and counter-narcotic efforts, promoting democratic and economic reform and improving education and health sectors that are in line with the Millennium Development Goals.

As for the Caucasus countries, overall financial aid from the United States included USD 242.5 Million for Georgia in 2009, as part of the USD 1 Billion in aid that the Bush administration promised in 2008 to help the country rebuild after its war with Russia. Economic aid to Armenia is set to decrease from USD 48 Million to USD 30 Million in 2009, while rising slightly for Azerbaijan, from USD 18.5 Million to USD 22.1 Million. The aid to these countries is aimed at enabling economic recovery; strengthening the separation of powers, developing a more vibrant civil society and continuing to develop and improve social sector reforms (USAID, 2009).

3. Literature Review

The literature on the effectiveness of foreign aid concentrates almost entirely on the macroeconomic effects of official development assistance, determining the impacts of foreign aid on economic growth, savings, and investment in the recipient countries. There is no strong theoretical framework to assess the effectiveness of foreign aid, and, as a consequence, the literature depends heavily on empirical work. Nonetheless, the empirical results obtained from previous studies are generally inconsistent. Although methodological issues in the evaluation of official development assistance have been improved, this strand of literature offers rather inconclusive results.

The concentration on whether foreign aid improves the economic growth of the recipient counties started with the two-gap model (Chenery and Strout, 1966) that continues

to provide the most important theoretical framework in the literature on foreign aid effectiveness. In this model, the less developed countries are forgoing profitable domestic investments in key sectors that are crucial for economic development due to financial constraints, specifically on domestic savings and export earnings. Although this two-gap model has been excessively criticized later, it has nevertheless provided the fundamental doctrines both for early foreign aid policies (Easterly, 1999) and for regression parameters of most of the empirical work that centered mainly on the foreign aid - growth and foreign aid - savings relationships. Most early empirical analysis has concluded that official development assistance had no significant impact on growth, savings or investment in the recipient countries. In their empirical results, Mosley et al (1992) have found that foreign aid increased public consumption and was unsuccessful in promoting domestic investment. Boone (1996), who found a negative relationship between savings and aid subsequently pointing to the failure of foreign aid to increase vital investment in recipient countries, also confirmed the latter finding. However, Burnside and Dollar (2000) in their influential study suggest that aid had a positive effect on growth for developing countries with good fiscal, monetary and trade policies in place but had little impact on those countries who were following poor policies. This finding was later criticized by Hansen and Tarp (2001), Easterly (2003) and Collier and Dehn (2001), who argued that even in the recipient countries with good policies, no robust association between foreign aid and economic growth can be found.

Four main arguments had been suggested to explain these unfortunate conclusions of most studies on the foreign aid effectiveness. First, aid is misallocated, i.e. international donors allocate financial aid for strategic purposes to the wrong countries. Second, foreign aid is misused by the recipient countries, whose governments pursue agendas that are not

geared towards achieving national development goals. Third, foreign aid has essentially been found to be detrimental to the growth of the recipient countries defeating its purpose in the first place. Lastly, GDP growth is not a proper measure of foreign aid effectiveness. Each of these arguments will be discussed in the following paragraphs.

Despite the fact that most of the empirical work implicitly assumes that the donor's purpose of giving financial aid is mainly to reduce the underlying poverty and to promote the economic growth in the recipient countries, a parallel strand of literature on how ultimately foreign aid is allocated has emerged in the recent years. Alesina and Dollar (2000) and Collier and Dollar (2002) have argued that donors often have different underlying motives and consequently dispense financial aid in line with their own strategic interests. For example, due to reasons related to political instability in the Middle East, Egypt and Israel have received much political and economic support from Western powers in the past several decades. Furthermore, factors such as colonial past and voting patterns in the United Nations explain more of the allocation of aid than do the economic needs or political institutions for that matter. The distribution of financial aid by the three biggest donors confirms this pattern. The United States directed approximately 30% of its total development assistance to Egypt and Israel. France gave a significant amount of aid to its former colonies. Countries that vote alongside with Japan in the United Nations assembly meetings receive higher financial aid from it. Not surprisingly, if a large percentage of official development assistance is given for strategic purposes of its bilateral donors, no significant impact of foreign aid on economic growth or poverty reduction of the recipient country should be expected.

Furthermore, most studies on the impact of foreign aid on economic growth of the recipient country assume that its government shares the donor's altruistic purposes of

promoting economic growth and alleviating the prevailing poverty. As it has been argued, this need not be the case. As argued by Klitgaard (1997) and Svensson (2000), a recipient government and a perfectly altruistic donor can have conflicting objectives, as the rent-seeking in the recipient country by many stakeholders influences the distribution of aid. The common resources in the country can be used either for private consumption or invested in the public goods. Svensson, by developing a theoretical model and empirically testing it, has shown that public goods provision does not necessarily increase with expanded government revenues that resulted from large inflows of foreign aid. If official development assistance is misallocated and misused by the government, it cannot be expected to have a significant positive effect on economic growth of the recipient country.

It appears that even if foreign aid inflow is causing improvements in the economy in the short run, these positive effects of aid are not extended to the long run. Two explanations of this phenomenon have been put forward. First, flow of foreign aid may weaken existing institutions and reduce future incentives (Adam and O'Connell, 1999). By expanding a government's resource, inflow of foreign aid relaxes the need to explain their actions to citizens, which can have an adverse and corrupting influence on even the best intentions of governments in the long run. In addition, although foreign aid is an additional resource to the government budget, the economy ultimately becomes lenient on raising the tax revenues, and subsequently more aid will be needed to keep the country balanced. Therefore, any positive effect that aid might have on growth will be offset in the long run through its impingement on existing institutions and creation of the dependency culture. Second, foreign aid may adversely affect a country's competitiveness by over-valuating the exchange rate prevalent in the recipient economy (Rajan and Subramanian, 2005). This is often referred to as "Dutch

disease" effect of official development assistance in the macroeconomic literature, which is reflected in a decline in the share of tradable industries in the manufacturing sector in countries that receive large inflow of foreign aid.

And lastly, as recommended by Boone (1996), foreign aid effectiveness should not be measured by its affect on GDP growth. Official development assistance could be increasing consumption rather than public investment in developing countries, which would explain the unfortunate results of empirical studies on economic growth. However official development assistance could still decrease poverty through either increased consumption of the poor population or by greater provision of public services for them. Boone reasons that, since infant mortality indicators react fast to higher consumption and improved health services, infant mortality can be considered a pertinent measure of improvements in economic conditions of the poor. To test this, Boone conducted an empirical study by looking at the impact of foreign aid on changes in basic indicators of human development such as infant mortality rate, primary schooling enrolment ratios, and life expectancy. Given the evolution in the committed purposes of donor community that range from industrialization programs to reducing poverty in the developing countries, as evidenced in the adoption of the Millennium Development Goals, I will follow Boone and test for the impact of official development assistance on human development indicator instead of macroeconomic variables.

Empirical studies of the impact of aid on human development indicators have been rather mixed and produced results that are ambiguous at best. Boone (1996), by using data on 97 countries between 1971 and 1990, found that aid increased consumption, but this higher consumption did not benefit the poor. Aid led to no significant improvement in infant mortality rates, primary schooling enrolment or life expectancy. He argues that this is strong

evidence that inflow of foreign aid primarily benefits wealthy political elite in the recipient countries as was later confirmed by Svennson (2000). Furthermore, Boone found that economies with liberal democratic political regimes, all things equal, have 30% lower infant mortality rates than economies with highly representative regimes. One plausible explanation that Boone puts forward is that the poor population is more empowered under liberal regimes, which causes governments to provide more basic services to them. However, once conditioning on these different regimes, his results suggest that all political systems support a high-income political elite since both democracies and weak forms of dictatorship depend for much of their support on patronage. Therefore, government officials are highly unlikely to adopt or implement policy reforms that can divert the allocation of foreign aid away from the ones preferred to those who are truly in need. Therefore, it is not surprising that aid benefits these elite and does little to improve the well being of the poor.

Furthermore, in recent years, many authors concentrated on using foreign aid targeted at specific sectors to measure its impact on pertinent human development indicators. Williamson (2008), for example, by using data on 208 countries during 1973 and 2004, was first to empirically test the hypothesis that increases in human welfare can be achieved through health sector specific foreign aid. His obtained results suggest that health care foreign aid does not significantly improve the overall health in the recipient countries, therefore confirming earlier suppositions on the ineffectiveness of official development assistance to achieve its purpose. However, Masud and Yontcheva (2005) have shown that NGO aid significantly reduces infant mortality rates while bilateral aid does not. They suggest that NGO aid may be more effective than government actions in reaching out to the poor as reducing infant mortality rates could be more efficiently done at the grassroots level.

In addition, bilateral aid seems fungible and its increases do not seem to be reflected in public health expenditure increases. The lack of resource additionality implies that increases in bilateral aid leads to a decline in non-aid financed expenditures, consequently canceling the potentially positive effect of bilateral aid on infant mortality rates.

The contribution of this paper to the existing literature on foreign aid effectiveness is essentially twofold. First, I complement the literature on the effectiveness of foreign aid by assessing the impact of official development assistance on the Human Development Indicator as oppose to GDP growth. Second, my focus is entirely based on countries of Former Soviet Union where little empirical research has been conducted so far. My main purpose is to verify empirically whether official development assistance had any positive impact on human development indicator in these countries in accordance with the Millennium Development Goals.

4. Empirical Methodology and Data

The first model presented in this paper is an ordinary least square regression that is used as the baseline specification. However, due to the omitted variable bias, the model is estimated using fixed effect regression in order to control for country and year effects. Next, instrumental variable estimation is implemented as the core analysis. And finally, due to the dynamism within the model, it will be estimated using Arellano-Bond dynamic panel - data estimation. A detailed description of the data is also provided in this section, including defining all variables, listing the data source and providing the descriptive statistics.

4.1. Benchmark Specification

To conduct an empirical analysis a linear model is employed:

$$HDI_{i,t} = \alpha + \beta ODA_{i,t} + \mu Z_{i,t}' + \varepsilon_{i,t} \text{ (7)}$$

where HDI is human development indicator, ODA is official development assistance, and Z vector of control variables. The HDI is reported annually in the Human Development Report (HDR) as a proxy measurement for human development. This annual data is gathered from HDRs published by UNDP between 1995 and 2006. The main explanatory variable of interest in this model is foreign aid, data for which is published by the Organization for Economic Cooperation and Development (OECD). A variety of other control variables that is included in the model are gross domestic product (GDP), population size, foreign direct investment, total health expenditure per capita, control for corruption index and rule of law index. All of these variables, except for total health expenditure, were obtained from the World Bank Database. The total expenditure on health per capita for selected countries was taken from the World Health Organization (WHO).

In equation (7), human development is influenced by economic performance as measured by GDP per capita, foreign direct investment, health expenditure, the foreign aid provided and the quality of institutions prevailing in the country. Incorporating these variables into the model can be justified on the grounds that economic prosperity of a country will generate better incomes for households. With gains in income, people have more money to spend on health and education, subsequently leading to improvements in human development (Rains et al., 2000; Bruno et al, 1995). Equivalently, higher investment in the productive sectors of the economy can result in expansion of domestic production. Increased domestic production will subsequently promote economic development that in turn will progress the human development (Solow, 1956; Jones, 1998). Furthermore, a large

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percentage of development assistance is allocated to economic infrastructure and service sectors such as energy, transport and telecommunications in addition to productive sectors, namely agriculture, industry, mining and construction, trade and tourism. Investment in these sectors positively impacts the progress towards better human development directly or indirectly (Burnside and Dollar, 2000; Murphy et al, 1994; Islam, 1992). However, the impact of foreign direct investment and GDP can be expected to take time as investment in these sectors needs a long gestation period. In addition, GDP is included as one of the components in HDI calculation. Therefore, both GDP and FDI are lagged for two years in the equation.

To control for institutional environment, I include two interrelated measures: control for corruption and rule of law indices. These indices are obtained from the Aggregate Governance Indicator, composed by World Bank. Control for corruption and rule of law indices are scaled from –2.5 to 2.5 with higher values corresponding to better governance outcomes. It has been shown that increases in quality of institutions prevailing in the country positively impact the economic development (Acemoglu, Johnson and Robinson, 2001). In addition, corruption has been cited as one of the main reasons behind the failure of foreign aid to achieve its main goal of helping developing country to eradicate the extreme poverty (Svensson, 2000). Therefore, a country's institutional environment may influence human development and, therefore, should be included in the analysis.

Due to the importance of controlling for the quality of institutions, total health expenditure and the level of income, several different model specifications are necessary. It is well documented that GDP is highly correlated with institutional indices and is usually not included in the same regression (Acemoglu, Johnson and Robinson, 2005, Acemoglu and

Johnson, 2005). Even though in this study the correlation between GDP and institutional quality is .07 and .02 (Appendix A), nevertheless the appropriate specification is necessary. Similarly, it has been well documented that one of the main determinants of health expenditure in developing countries is the level of income prevalent in the economy (Hitiris and Posnett, 1992). Therefore, including both GDP and either one of measurements of institutional quality, as well as GDP and total health expenditure may cause inaccurate results. At the same time, it is of crucial importance that both growth and institutional quality be accounted for in the model specification. Therefore, I estimate my model with 3 different regressions:

1) GDP only;

2) Control for corruption index and total health expenditure;

3) Rule of law index and total health expenditure.

All three regressions include foreign direct investment as an additional control variable. In addition, in order to remove any variation due to country and time-specific effects, country and year dummies are included in the model when analysing it using fixed effects estimator. Finally, a panel data set from 1995 to 2006 is constructed for 9 countries of Former Soviet Union to estimate the model.

4.2. OLS and Fixed Effects with Instrumental Variable Estimation

To make sure that endogeneity is not leading to my results using the OLS and fixed effects models, I reassess the model using instrumental variable approach in order to control for possible reverse causality. It might be the case that countries that display low indicators

for human development receive more financial aid accordingly. Therefore, it is important to address this issue by implementing an instrument for official development assistance.

Previous empirical studies were able to use income or population as valid instruments for foreign aid (Burnside and Dollar, 2000, Djankov et al, 2005). However, inclusions of these variables as instruments will highly correlate with other explanatory variables within the model. Therefore, these variables do not constitute good instruments in my model. As it was mentioned in the previous section of this paper, others studies have indicated that aid is not given primarily to help the poor, but rather allocated according to the special interests of the bilateral or multilateral donors (Alesina and Dollar, 2000; Collier and Dollar, 2002). Therefore, another standard instrument for foreign aid is lagged aid itself. Boone (1996) has illustrated that lagging foreign aid two periods can be used as a valid instrument for current aid since it shows the relatively permanent strategic interests of donor countries. This argument is justified on the basis that foreign assistance is allocated as a strategic, political move of donor countries, not necessarily based on financial needs of recipient countries. Therefore, the instrument for official development assistance from the existing literature that fits my model best is lagged foreign aid itself.

The next step is to provide validity of two-lagged foreign aid as my chosen instrument. Appendix B exhibits results of the first stage for each of the three regression specifications. These results suggest that two-lagged foreign aid works well as an appropriate instrument in my model. Granger causality test for the hypothesis that the predictive power of the instrument is zero has been rejected with F-statistic ranging from 10.34 to 13.11, depending on the specification. This indicates that two-lagged aid is providing predictive power in the first stage, therefore constitutes a valid instrument. It is also imperative that

official development assistance is not correlated with human development indicator. As Appendix C shows, this is in fact the case, as two-period lags of foreign aid is not correlated with HDI.

The OLS and fixed effects model with instrumental variable estimation specification is:

$$Foreign\ Aid_{i,t} = \alpha Foreign\ Aid\,(L.2)_{i,t} + \varepsilon_{i,t}\ (8)$$

$$HDI_{i,t} = \beta Z'_{i,t} + \mu V_{i,t} + \upsilon_{i,t}\ (9)$$

Where L.2 is two-period lagged foreign aid and acts as an instrument, V_i- instrument for foreign aid used in the second-stage of the regression.

4.3. Dynamic Panel Data Estimation

The failure to account explicitly for unobserved individual effects in dynamic panel data, such as the one used in this analysis, induces bias and inconsistency in cross-sectional estimators. To correct for these problems I use a generalized method of moment estimator. Dynamic panel data model includes, as the part of its specification, both lagged dependent variable (HDI) and unobserved individual effects. It is a very powerful tool that permits for empirical modeling of dynamics while accounting for individual-level heterogeneity. This will enable to parse out whether past behaviour directly affects current behaviour or whether individuals are predisposed to behave one way or another. The HDI performance of a country in the past might have a direct impact in its current and future performance, or it could be the case that HDI is predisposed to perform in a certain way. Since dynamic panel data explicitly includes one-period lagged HDI to account for its past behaviour, it will enable me to better

understand what factor drives HDI throughout time, differentiating between true dynamics and factors that vary across, but not within, individual country over time, even if such factors are unobservable.

The dynamic panel data analysis using Arellano and Bond estimator is of the following specification:

$$HDI_{i,t} = \alpha HDI_{i,t-1} + \beta X'_{i,t} + \varepsilon_{i,t} \ (10)$$

where $HDI_{i,\,t-1}$ is one period lagged, and $X'_{i,t}$ is the matrix of first-difference of explanatory variables (ODA, FDI, GDP, Total Health Expenditure, Control for Corruption and Rule of Law indices) that act as instruments for the first-difference equation.

4.4. Descriptive Statistics

The panel data set includes nine countries of Former Soviet Union: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan and Uzbekistan. Each variable in the model to be estimated, except HDI, has been converted to per capita basis in order to control for population growth. Therefore, it is not necessary to have the population growth as one of the explanatory variables on the right side of the regression. Finally, the log form of GDP is used in the empirical analysis.

Table 2 presents summary statistics of the dependent as well as explanatory variables. As it can be seen, countries under analysis have large dispersion in economic development as reflected by income per capita. Minimum value of GDP per capita is as low as USD 140, while the maximum is USD 5290. However, these countries display similar patterns in institutional development with corruption control and rule of law bearing a low value by

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international standards. Health expenditure as it was previously mentioned is low due to the fiscal issues these countries face.

5. Results

Table 3 depicts the results of the estimation for the equation (7) using OLS method. As it was mentioned, it was essential to run the model with three different specifications in order to gain a more accurate description. The layout of the table is as follows: Column 1 includes GDP per capita as control variable; column 2 includes the total health expenditure per capita and control for corruption index as control variables; and column 3 includes rule of law index and total health expenditure per capita as control variables. All three regressions include FDI per capita as exogenous variable.

Table 2. Summary Statistics

	Observations	Mean	STDEV	Min	Max
HDI	108	0.713	0.039612	0.575	0.807
GDP	108	602.5141	723.0339	139.4157	5289.41066
ODA	108	15.11928	12.91341	0.502958	56.3807043
FDI	108	18.41588	69.49244	-1.05332	428.11567
HealthExp	102	147.5	75.48415	20	355
CCI	99	-0.98336	0.254432	-1.74906	-0.258135
RLI	99	-0.97053	0.338375	-1.7468	-0.1030369

A clear result has emerged: official development assistance has positive and significant impact on human development index in the nine recipient countries of Former Soviet Union, even after controlling for GDP and FDI. However, once controlling for the quality of institutions prevailing in the recipient country, this impact becomes statistically insignificant while remaining positive. GDP and total health expenditure exhibit positive signs as expected and are statistically significant. Foreign direct investment is consistently

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positive and statistically significant throughout three specifications of the model. And finally, as predicted, improvements in the quality of institutions have positive and significant impact on human development in a country.

Table 3. The Impact of ODA on Human Development Indicator

	Pooled OLS		
	Dependent Variable HDI		
	1	2	3
ODA(per capita)	.0009**(.0002)	.0001(.0002)	.00017(.0002)
GDP(per capita)	.0133**(.0060)		
FDI(per capita)	.0002**(.00005)	.0001**(.00003)	.00014**(.00003)
Health Expenditure(per capita)		.0002**(.00004)	.00023**(.00004)
CCI		.0354**(.0131)	
RLI			.01864**(.00925)
Constant	.6043(.0369)	.7125(.0168)	.69243(.01263)
R-squared	0.37	0.57	0.56
No. observation	108	94	94

Standard errors are in parentheses.

** significant at 5%.

However, by running just a regular OLS model, I am running a risk of obtaining biased estimators due to the fact that certain variables that also impact the human development index were not included in the model. Therefore, I correct for this potential mistake by running a fixed effect model that includes dummies for the year and country.

In general, official development assistance has a positive effect on human development in the studied countries, though it becomes statistically insignificant once the quality of institutions is controlled for in the model. Table 3 and 4 suggest that foreign aid is effective at improving human welfare in the recipient countries. To determine these results more definitely, I implement an instrumental variable estimation to control for reverse causality issue. Recall that my instrument for official development assistance is a two-period

lag of foreign aid itself. The first stage results are presented in Appendix B. All exogenous variables that enter into the second stage also enter the first, including both country and year dummies.

Table4. The Impact of ODA on Human Development Indicator

	Fixed Effects Estimation		
	Dependent Variable HDI		
	1	2	3
ODA(per capita)	.0011** (.0004)	.00005(.0003)	.00012(.00033)
GDP(per capita)	.0122(.0121)		
FDI(per capita)	.0002**(.00005)	.00009**(.00004)	.00009**(.00004)
Health Expenditure(per capita)		.00011**(.00005)	.00014**(.00005)
CCI		.03703**(.0122)	
RLI			.00975(.01202)
Constant	.6116(.0728)	.7321(.0145)	.70133(.01339)
R-squared	0.500	0.64	0.74
No. observation	108	94	94

Standard errors are in parentheses.
** significant at 5%.

The results of the ordinary least square and fixed effects models with instrumental variable estimation are presented in Tables 5 and 6. The results from this type of estimation almost uniformly confirm my previously obtained results. After controlling for reverse causality, official development assistance has a positive and statistically significant impact on the human development index of the nine recipient countries of Former Soviet Union. However, after controlling for the quality of institutions, this impact remains positive but not statistically significant. As for GDP, it has a positive and statistically significant impact only in ordinary least square regression model, while becoming statistically insignificant in the fixed effects model. As it was predicted, foreign direct investment, total health expenditure and quality of institutions have positive and statistically significant impact on the development of human welfare indicator.

Table 5. The Impact of ODA on Human Development Indicator

	Pooled OLS with Instrumental Variable Estimation		
	Dependent Variable HDI		
	1	2	3
ODA(per capita)	.00092**(.00028)	.00004(.00025)	.00004(.00027)
GDP(per capita)	.01583**(.00612)		
FDI(per capita)	.00022**(.00005)	.00015**(.00003)	.00013**(.00003)
Health Expenditure(per capita)		.00021**(.00003)	.00024**(.00004)
CCI		.03645**(.01237)	
RLI			.02155**(.00982)
Constant	.5925(.03795)	.71378(.01607)	.6966(.01366)
R-squared	0.35	0.57	0.55
No. observations	108	94	94

Standard errors are in parentheses.
** significant at 5%.

Table6. The Impact of ODA on Human Development Indicator

	Fixed Effects with Instrumental Variable Estimation		
	Dependent Variable HDI		
	1	2	3
ODA(per capita)	.00121**(.00043)	.00022(.00033)	.00021(.00035)
GDP(per capita)	.01299(.01187)		
FDI(per capita)	.00015**(.00005)	.00009**(.00004)	.00008**(.00003)
Health Expenditure(per capita)		.00011**(.00004)	.00013**(.00005)
CCI		.03708**(.01205)	
RLI			.00938**(.012002)
Constant	.6097(.07231)	.73192**(.01434)	.70100(.01329)
R-squared	0.42	0.61	0.73
No. observations	108	94	94

Standard errors are in parentheses.
** significant at 5%.

This core analysis supports my baseline specification, suggesting that official development assistance is effective at improving human development in nine countries of Former Soviet Union, even though statistically insignificant when controlling for the quality

of institutions prevailing in the recipient country. However, due to the important implications to be drawn from this analysis, I implement Arellano-Bond dynamic panel-data estimation method to reduce the biasness and inconsistency. As explained in the previous section, this is due to the fact that the past level of HDI might have a direct impact on its current and future performance.

The results obtained from this re-estimation, which are depicted in Table 7, bear little resemblance to those previously obtained. The effect of official development assistance on human development becomes negative, even though statistically insignificant, when controlling for the quality of institutions prevailing in the recipient country. The impact of foreign direct investment and total health expenditure remain positive yet statistically insignificant. However, GDP and quality of institutions have a positive and statistically significant association with the positive development of human welfare as reflected in the human development index. Furthermore, conducted Sargan on over-identifying restrictions do not reject the hypothesis on the validity of the instruments.

Table 7. The Impact of ODA on Human Development Indicator

	Arellano-Bond dynamic panel-data estimation		
	Dependent Variable HDI		
	1	2	3
HDI L.1	.48543**(.06005)	.4382**(.0634)	.4941**(.06410)
ODA(per capita)	-.0002(.0002446)	-.00026(.00027)	-.000303(.00028)
GDP(per capita)	.0182**(.00756)		
FDI(per capita)	.000023(.00003)	.00002(.00004)	.0000242(.00004)
Health Expenditure(per capita)		.00004(.000052)	.000048(.000053)
CCI		.02094*(.01227)	
RLI			.0183015*(.01060)
Sargan-Test	.44	.57	.65
No. observations	90	84	84

Robust standard errors are in parentheses.
** significant at 5%.
* significant at 10%.

6. Conclusions

For more than two decades the international community has increased its focus on poverty reduction that is subsequently reflected in human development indicators as the overarching objective of economic policy for developing countries. According to World Bank, in a typical low-income developing country, foreign aid continues to be by far the main source of external income, adding up to 13% of GDP (World Bank, 2009). One might wonder, however, what has this extensive resource transfer has accomplished in achieving its intended goals. The objective of this paper was, therefore to examine the development of human welfare supported by the official development assistance in nine selected countries of Former Soviet Union. In order to perform this task, I developed and tested an OLS, fixed effects and dynamic panel data model while also controlling for reverse causality. Results from the conducted analysis lead to the following conclusions:

First, a review of the past eleven years of effort for foreign aid reveals that there are still discrepancies in human development dimensions, namely health, income and education in the studied countries. Furthermore, among these nations, foreign aid is not equally distributed. Some countries, such as Tajikistan and Turkmenistan, with relatively low levels of human development as reflected in life expectancy and income per capita, are provided with small amount of official development assistance. United States and Germany are seen as the main and dominant donors among all foreign aid providers to these nine countries. Therefore, effective coordination among donor countries is essential in order to fix the foreign aid system and improve its effectiveness in achieving the intended goals.

Second, my findings suggest an important role of institutions in determining human development as reflected by control of corruption or rule of law indices. Therefore, if foreign aid is to make an impact on human development, strong institutions should be in place. Strong aid provisions are necessary in order to achieve the intended goals.

Finally, economic growth and foreign direct investment in these countries is subject to positive associations with human development. These results once again validate the argument that a country's GDP growth and investment in productive sectors will promote economic development subsequently leading to improvements in the living standards of people. Official development assistance, on the other hand, has a weak positive impact on the human development in the nine selected countries of Former Soviet Union depending on the model specification and the estimation method. Therefore, no strong conclusion on the effect of foreign aid on the improvements of human welfare can be made given current results. Further research with better data and improved theoretical foundation is necessary in order to better understand the role of official development assistance in the development of human welfare in the recipient countries.

Appendix A: Correlation Matrix

	HDI	GDP	ODA	FDI	Health Exp.	CCI	RLI
HDI	1						
GDP	0.499	1					
ODA	0.2958	0.082	1				
FDI	0.5209	0.4865	-0.0406	1			
Health Exp.	0.6796	0.2652	0.2955	0.4021	1		
CCI	0.4038	0.0224	0.6182	0.0164	0.3132	1	
RLI	0.3525	0.0745	0.5542	0.116	0.2226	0.8095	1

Appendix B: First Stage Results for ODA

	Dependent Variable ODA		
	1	2	3
Two-period lagged ODA (IV)	0.422 **(0.126)	0.403 **(0.111)	0.366**(0.114)
F-statistic	11.14	13.11	10.34
R-squared	0.4349	0.5402	0.49
No. observation	108	94	94

Standard errors are in parentheses. Country and year effects are included in the regression. Column 1 includes GDP and FDI as control variables; column 2 includes FDI, health expenditure and CCI as control variables; column 3 includes FDI, health expenditure and RLI as control variables.

Appendix C: The impact of ODA on HDI

	Dependent Variable HDI		
	1	**2**	**3**
ODA(per capita)	.0007414(.0004183)	3.83e-06 (.0003292)	.00008(.00035)
Two-period lagged ODA	.0008739(.0004631)	.0002223(.0003469)	.000186(.0003675)
GDP(per capita)	.0073056(.0121806)		
FDI(per capita)	.0001627(.0000516)	.0000901**(.0000377)	.0000918**(.0000398)
Health Expenditure(per capita)		.0001086**(.0000532)	.0001295**(.0000563)
CCI		.0370673**(.0121955)	
RLI			.0090567(.0121573)
F-statistic	3.56	0.29	0.26
R-squared	0.36	0.41	0.73
No. observation	108	94	94

Standard errors are in parentheses. Country and year effects are included in the regression

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