THE IMPACT OF TECHNICAL ASSISTANCE ON INSTITUTIONAL DEVELOPMENT

By

DONG, YOONJEI

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
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ABSTRACT

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In order to improve the institution of developing countries, many donor countries, including emerging donors, provide official development assistance (ODA) in the form of technical assistance. However, it has been difficult to assess the outcomes of technical assistance with precision, which may frequently be indirect and have long time lags. This paper analyzes evaluation reports and academic papers that attempt to measure the impact of technical assistance and empirically tests the relationship between technical assistance and governance. Based on a cross-sectional times-series analysis, this paper finds that the effectiveness of technical assistance may depend on the country's initial level of institutional quality. This paper also recommends donor countries to conduct rigorous impact evaluation of technical assistance projects in order to improve their effectiveness.

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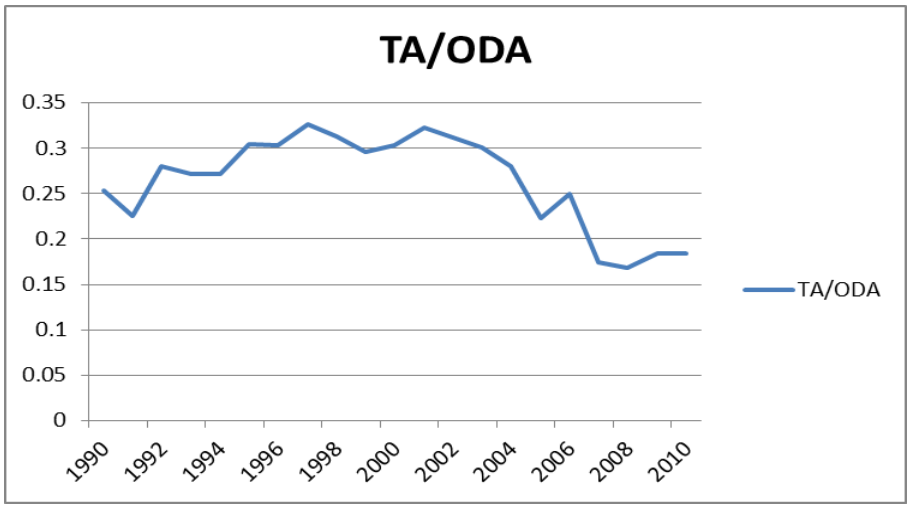
I. INTRODUCTION

There have been various efforts to improve the institutional capacity of developing countries. Most importantly, different aid agencies and international organizations provide official development assistance in the form of technical assistance projects in order to support their institutional and capacity development. Indeed, institutional development is crucial for growth and poverty reduction in developing countries. Due to the poor management of the budget and absence of legal systems, many countries suffer from lack of adequate access to health, education and basic services.

At the same time, there has been little understanding of the effectiveness of technical assistance. Most of the studies that examine the impact of technical assistance projects use incomplete methods which are affected by the subjectivity of evaluators. By quantitatively analyzing the impact of technical assistance on institutional development, this study aims to provide valuable insights on aid effectiveness. This paper starts by introducing the international trend of technical assistance and analyzes how technical assistance projects are evaluated by international organizations and development agencies. Before making an empirical test of the impact of technical assistance on institutional development, this paper examines a number of empirical studies related to aid effectiveness.

II. LITERATURE REVIEW

Technical assistance has been provided by donor countries in order to improve the institutional capacity of the recipient countries. For example, donor countries provide policy advices, send experts or implement training programs to improve the capabilities of the public officials and thus foster institutional development.



Source: OECD Statistics

The above graph shows the percentage of free-standing technical cooperation over total bilateral foreign assistance from 1990 to 2010. Technical assistance accounts for approximately one quarter of total bilateral aid provided by DAC countries from 1990 to 2010. At the same time, the percentage of technical assistance over total bilateral aid has started to decline since early 2000s. As weak institutions are considered to be one of the main obstacles for economic growth, donor countries have been providing a large percentage of official development assistance (ODA) in the form of capacity building or institutional development projects. In fact, OECD reports that one third of technical assistance projects are implemented in the form of capacity development projects.[1]

However, criticisms have been made regarding the effectiveness of technical assistance programs. In 1993, UNDP made an in-depth review of technical assistance and concluded that the supply-driven nature of technical assistance is one of the main reasons for the failure

[1] OECD (2005), *Development Co-operation Report 2005: Efforts and Policies of the Members of the Development Assistance Committee*, 114.

of technical assistance programs.[2] For instance, donor countries neglect the local context of each recipient country and provide irrelevant policy guidance. According to OECD Development Cooperation Report in 2005, technical assistance, especially the provision of experts, was criticized for imposing high costs on recipients as well as donor countries due to high professional fees. At the same time, scholarships to study abroad may result in brain drain by fostering skilled people to migrate to advanced countries.[3]

In response to the criticisms, donor countries are making efforts to reform their technical assistance programs. While knowledge, in the past, was considered to be transferred from developed to developing countries in a top-down mode, many technical assistance programs nowadays try to incorporate local knowledge as well. Also, emerging countries, including South Korea and Brazil, try to share their development experiences through technical assistance programs. For instance, South Korea has launched Knowledge Sharing Program in 2004 and provides policy consultations to developing countries through its unique development experiences.

Despite the reform efforts made by donor countries and international organizations, the effectiveness of technical assistance is yet to be proven. Donor agencies and international organizations try to evaluate their technical assistance at project-level. Due to the inherent difficulties in evaluating technical assistance projects, however, agencies and organizations fail to conduct objective evaluation that proves the effectiveness of their projects. This paper further analyzes the evaluation reports issued by different organizations and aims to measure the effectiveness of technical assistance at project-level.

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[2] Elliot Berg, “Rethinking Technical Cooperation: Reforms for Capacity Building in Africa." United Nations Development Program. 1993.
[3] OECD (2005), 124.

III. EVALUATION OF TECHNICAL ASSISTANCE BY INTERNATIONAL ORGANIZATIONS

1. International Monetary Fund (IMF)

Different international organizations provide technical assistance to developing countries, mostly in order to reform the public sector of the recipient country. For example, the International Monetary Fund (IMF) aims to enhance the economic policy and financial management of developing countries by improving the capacity of public officials and helping countries to conduct proper macroeconomic and structural policy reforms.[4] In order to assess the effectiveness of technical assistance, the IMF made field visits to the recipient countries in 2005 and categorized the effect into three different stages – "the immediate improvements in the technical capabilities of agencies receiving technical assistance, the ability of the agencies to apply and enforce that increased capability, and wherever possible, the ultimate outcomes on the ground."[5]

The evaluation report by the IMF states that its technical assistance programs are generally effective in improving the technical capabilities of agencies. At the same time, the IMF's evaluation report acknowledges that, due to the different political and environmental situation of each country, there is a great variability in the extent to which the agencies make use of their enhanced capabilities. For example, as a result of the technical assistance program provided to the banking sector of Cambodia, the country successfully downsized and relicensed a number of banks. The IMF acknowledges that the success stems from the strong interest of the highest authorities of National Bank of Cambodia to reform the banking

[4] International Monetary Fund, *Evaluation of the Technical Assistance Provided by the International Monetary Fund*, 2005.
[5] Ibid., 8.

sector. In contrast, efforts to reform the customs in Cambodia were not successful due to the opposition from the strong interest groups. The case of Cambodia shows that domestic ownership is the most important factor that determines the effect of technical assistance.[6] At the same time, the IMF recognizes the methodological limitations of its study. While technical outcomes, such as the number of trained officials, can be quantified with little difficulties, it is complicated to identify the long-term impacts which may be influenced by other environmental factors.[7]

2. World Bank

Together with the Korea Development Institute (KDI), the World Bank has evaluated a technical assistance program provided by South Korea to Dominican Republic in the area of export promotion. The export promotion program was part of the Knowledge Sharing Program (KSP) under which South Korea provides policy consultation to developing countries. In 2006, President Leonel Fernandez Reyna of Dominican Republic visited Korea in order to participate in seminars on Korea's development experience. During his visit, he was impressed by the rapid development of Korea and recognized that export-oriented policies were key to Korean development. He requested KDI to share the export development experience, and as a result, technical assistance for export development program started in 2008.

The World Bank used the Capacity Development and Results Framework (CDRF), which tracks the intermediate outcomes, including increased awareness and enhanced knowledge, to measure the effectiveness of the program. By analyzing presidential decrees and high-level statements that were issued after the program in Dominican Republic, the World Bank

[6] Ibid., 87.
[7] Ibid., 86.

concludes that KSP improved the awareness of high-level government officials.[8] Especially, the officials became aware of the importance of energy sector reform and public-private partnership to promote export.

Compared to the Cambodian case, the program in Dominican Republic successfully improved domestic commitment by improving the awareness of high-level officials. At the same time, the method of interpreting high-level statements is vulnerable to the subjectivity of the evaluator, and should be based on clearer standard. In other words, more rigorous impact evaluation is needed in order to prove if the program improved the institutional capacity of Dominican Republic. Similar to the evaluation framework of the IMF, CDRF is not a useful tool to measure the long-term effect of technical assistance projects.

As discussed in the evaluation reports by the IMF and World Bank, technical assistance may improve the technical capabilities of public officials, and thus promote institutional development. Despite its objective to improve the institutional and capacity development of developing countries, however, the improved capacity resulting from technical assistance may not translate into policy or institutional reform as in the case in Cambodia. Since technical assistance has impacts with significant time lags, it is complicated to measure the ultimate effects of technical assistance. Even though objective indicators are chosen to track the impact of technical assistance, the indicators may be affected by different environmental circumstances in developing countries. In order to quantify the impact of technical assistance on institutional development, innovative impact evaluation method has been utilized by some donor countries. This paper will further discuss the theory-based impact evaluation developed by the International Initiative for Impact Evaluation.

[8] Korea Development Institute and World Bank Institute (2011). *Using Knowledge Exchange for Capacity Development: What Works in Global Practice*, 40.

IV. IMPACT EVALUATION OF TECHNICAL ASSISTANCE

1. Theory-based Impact Evaluation

Impact evaluation is defined as a procedure to measure "the net change in outcomes amongst a particular group, or groups of people that can be attributed to a specific program."[9] In other words, impact evaluation method is a tool to quantify the magnitude of the impact of a program, and is widely used to evaluate aid projects. At the same time, its application to technical assistance programs is restricted. Technical assistance mostly consists of policy consultation, expert advice, and training of public officials. Since its impact is mostly indirect and has extended time lags, it is difficult to measure its impact with precision. For example, while the impact of education can be measured by an increase in wages or employment rates, it is hard to measure the decline in corruption resulting from a capacity building program. Also, the program may have unintended spillover effects that change the behavior of individuals or groups that are not in the program, and thus underestimate the impact of the program.

Despite these methodological challenges, donor countries have made continuous efforts to measure the impact of technical assistance programs. For example, the international initiative for impact evaluation has formulated a theory-based impact evaluation method which tries to predict the *counterfactual* or what the condition of the target might be in the absence of the program of interest, and compare the counterfactual to the impact of the intervention. This paper further introduces a study that evaluates the impact of anti-corruption policy based on the theory-based impact evaluation method.

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[9] Federal Ministry for Economic Cooperation and Development of Germany, BMZ Evaluation Division. *Micro-Methods for in Evaluating Governance Interventions*, 2011, 10.

2. Case Study: Anti-Corruption Policy

Many donor countries have implemented various types of anti-corruption programs in developing countries. In order to reduce corruption, some development programs include monitoring and incentive schemes for public officials. However, these types of interventions are prone to failure when the individuals who are assigned to monitor are corrupt as well. At the same time, monitoring by the citizens may be ineffective when they do not have enough incentives or enough skills or knowledge to monitor.[10]

To find out the most effective anti-corruption strategy, Benjamin Olken, Economics Professor at MIT, conducted an impact evaluation based on road project cases in Indonesia. Olken selected 608 villages and randomly divided them into four groups. For the first group, he explained that the road project will be audited by the central government. For the second group, he organized village-level accountability meetings, while, for the third group, not only village-level meetings were organized but also survey forms were distributed to villagers. The fourth group served as the control group for his study. Olken measured each group's level of corruption by calculating the difference between reported expenditure and individual engineers' estimates.

Interestingly, he found that corruption dropped significantly, by 8%, when the village was audited by the central government, while monitoring by the villagers had little impact on reducing the level of corruption.[11] The author explains that, since reducing corruption in public service is a public good, villagers have incentives to free-ride on the contribution made by active citizens. In contrast, individuals in the first group were afraid of the punishment

[10] Ibid., 18.
[11] Ibid., 19.

by the central government, and changed their behaviors. Based on the findings of the evaluation, development practitioners can predict which anti-corruption policies work best in different countries and redesign their anti-corruption programs.

Compared to previous evaluations of technical assistance by the IMF and World Bank, which mostly relied on expert judgment, the aforementioned study used quantitative methods to evaluate the impact of anti-corruption strategies. Specifically, the study conducted randomized control trials in order to compare the effect of the intervention to the counterfactual. As a result, the study can be regarded as a more rigorous evaluation of the intervention, and provides policy guidance for those who implement technical assistance programs in developing countries.

At the same time, it is difficult to generalize project-level impact evaluation, and thus provides little implication on the effectiveness of other technical assistance projects. By empirically testing the relationship between technical assistance and institutional development index, this study attempts to provide valuable findings on the effectiveness of technical assistance. Before introducing the findings, this paper will analyze statistical studies that examine the effect of official development assistance, especially technical assistance.

V. PREVIOUS EMPIRICAL STUDIES ON AID EFFECTIVENESS

Many scholars have conducted statistical studies to measure the impact of foreign assistance. Most importantly, Burnside and Dollar (2000) find that aid has a negative impact on growth in countries with bad monetary, fiscal and trade policies, and thus conclude that aid should be given to countries with good policies. The findings of Burnside and Dollar (2000) provide important policy recommendations for donor countries. Since the improvement of

governance or institution is critical for positive impact of aid on growth, they suggest that technical assistance would be a good instrument for improving governance in developing countries.

Nevertheless, there are limited studies that test the impact of technical assistance on institutional development. Most recently, Busse and Groning (2009) find that an increase in foreign assistance leads to a worsening of governance due to increased rent-seeking behaviors by the incumbents. However, their study does not focus on technical assistance as their primary independent variable. While foreign assistance has a negative impact on governance, it is possible that technical assistance fosters institutional development.

Some scholars have decomposed foreign assistance into several categories and examined the impact of technical assistance. Mavrotas (2002) examined how different types of aid have dissimilar impacts on growth in India from 1970 to 1992. According to Mavrotas, program aid and project assistance exerts negative impact on India's growth during the concerned period. However, in the presence of financial policy variable which is measured by Money Supply over GDP, the coefficients for program aid and project assistance become positively significant, while the coefficient for technical assistance becomes strongly negative. The author concludes that different types of aid have differential impact on growth in the presence of policies, and emphasizes the importance of decomposition of aid in aid effectiveness studies.

Other scholars have conducted cross-sectional analysis to measure the impact of foreign assistance, including technical assistance, on governance. Rajan and Subramanian (2007) examined how industries that are more dependent on good governance perform under larger amount of foreign assistance. They quantitatively found that technical assistance is not

different from other types of assistance in the aspect that it exhibits disproportionately negative effect on industries that are more dependent on governance. In other words, the study finds that technical assistance is associated with a lower level of governance.

In addition, Knack (2001) explains that foreign assistance, especially technical assistance, had a negative impact on institutional development from 1982 to 1995. Knack writes that aid dependence fosters rent-seeking and corruption, and thus reduces institutional quality. He concludes that aid should be provided in the form of direct budgetary support in order to improve administrative capacity of recipient countries. However, Knack does not prove that direct budgetary support strengthen the administrative capacity of recipient countries. In reality, the direct budget support mode of aid requires a greater capacity and better institution of recipient countries. Rather, repeated program assistance implemented by the recipients may more effectively strengthen their administrative capacity, and this strengthened capacity will enable the recipient to efficiently utilize the direct budget support mode of aid. He also examines the time period between 1982 and 1995, and it is possible that the impact of technical assistance became positive after the reform efforts during the 1990s. This study aims to build upon the findings of previous scholars and empirically test the impact of technical assistance on institutional development from 1990 to 2010.

VI. METHODOLOGY

The empirical work of this study aims to answer mainly two questions: (1) What is the impact of technical assistance on institutional development? (2) Under what conditions would the impact of technical assistance improve? Based on the longitudinal data of 89 countries from 1990 to 2010, this paper quantitatively tests the impact of technical assistance on institutional development. The basic model of the empirical work stands as follows:

$$\triangle ICRG_{it} = ß_0 + TA_{it} + yX_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

where $\triangle ICRG_{it}$ indicates the change in ICRG value from year 1990 for country *i* at period *t*. TA_{it}, the variable of interest, indicates the amount of technical assistance received as a percentage of GDP, X_{it} stands for the set of control variables, α_i for the set of country dummies, λ_t for the set of time dummies, and ε_{it} for the error term. In order to control for other factors that may have affected institutional development during this period, variables such as population growth, trade as a percentage of GDP, annual GDP growth rate, school enrollment rate, ethnic and religious tensions, external and internal conflicts, democratic accountability, government stability and government consumption as a percentage of GDP were included. In addition, country dummies were included in the model to control for country fixed effects, and time dummies to account for secular changes.

In order to control for any endogeneity problem, another set of tests were conducted by including ICRG values of the previous two years. The equation stands as follows:

$$\triangle ICRG_{it} = ß_0 + ß_1 ICRG_{it-1} + ß_2 ICRG_{it-2} + ß_3 TA_{it} + yX_{it} + \lambda_t + \varepsilon_{it}$$

For instance, technical assistance may be given to countries with high institutional quality and this reserve causality problem is controlled by including the institutional qualities of the respective country during the previous two years.

Several tests were conducted in order to specify the method of analysis. First, Hausman test was conducted in order to determine if unobserved country heterogeneities are uncorrelated with the explanatory variables. Based on the test result, we were not able to assume that the

unobserved effect is uncorrelated with each explanatory variable, and chose the fixed effects model over random effects model (Appendix 3). One drawback of using fixed effects model is that it is impossible to measure the impact of time-invariant variable.

In order to test if the model suffers from heteroskedasticity problem, likelihood-ratio test was conducted. Heteroskedasticity problem does not cause bias or inconsistency in the OLS estimators, but results in invalid t-statistic and confidence interval due to incorrect variance. The likelihood-ratio test result showed that the standard errors of the OLS estimates were inflated due to heteroskedasticity problem (Appendix 4). For this reason, this paper also presents the result from Feasible GLS estimation method which provides more consistent and efficient estimator than OLS.

This paper uses cross-country time-series data from 1990 to 2010 for 89 countries. The quality of governance is measured by three sub-components of the International Country Risk Guide (ICRG), which are the degree of corruption, law and order, and bureaucratic quality. The ICRG data has been previously used by many scholars, including Knack (2001) and Busse and Groning (2009), in order to test aid effectiveness.

Corruption index measures corruption level within the political system. The scale ranges from zero, which indicates the highest level of corruption, to six, which indicates the lowest level of corruption. Law and order index is a composite index of law, which measures the strength and fairness of the legal system, and order, which assesses the citizens' adherence to the law. The scale ranges from zero, which indicates the lowest level of law and order, to six, which indicates the highest level of law and order. Bureaucratic quality is also rescaled into an index that ranges from zero to six. The highest score is given to countries where the

bureaucracy has the capability to govern without radical changes in policy or disruptions in public services. Since governance indicator in our study is the summation of three-subcomponents, the total point ranges from zero, which indicates low institutional quality, to eighteen, which indicates high institutional quality.

Instead of using the total ICRG rating as the dependent variable, this paper subtracts the governance value at the respective year from the initial governance value for each country in order to measure the impact of technical assistance on the changes in institutional quality. At the same time, the limited opportunities of highly-scored countries to increase their value can be controlled by including initial governance value in the model. Since time-invariant variables are omitted from the fixed-effect model, initial governance value is only included when FGLS method is used.

In order to account for technical assistance, this paper uses the data on technical cooperation grants compiled by the World Bank Databank. The amount of technical assistance received by each recipient country is expressed as a percentage of each country's Gross Domestic Product (GDP). In case technical assistance has a negative impact on institutional development, recipient countries with higher amount of technical assistance are likely to have decreasing governance scores over time, compared to other countries in the sample.

Apart from the two main variables, a number of variables are included in order to control for country-specific factors, or political, social and economic contexts that may influence institutional quality. The control variables are decided based on the existing theoretical and empirical studies on institution.

First, many scholars found that higher educational attainment promote institutional development, since better educated citizens are more likely to become involved in public decision making procedure and demand better governance.[12] Educational attainment is measured by secondary school enrollment rate in this study for several reasons. Many students from developing countries do not proceed to secondary school after primary school, and the enrollment to secondary education is identified as the largest hurdle in education for many developing countries. In addition, students who have received secondary education are most likely to be involved in public decision making process to influence institutional development. Similarly, larger countries are more likely to have larger human resources that can contribute to institutional development, and thus higher population growth rate may also be associated with institutional development. Thus, the coefficients for educational attainment and population are expected to be positive.

As a country better integrates into the global market, larger number of economic agents will be affected by the country's institutional quality. As a result, rent-seeking and corruption would be more difficult and policy-makers will have increased incentives to improve their governance. For this reason, we expect that trade or foreign direct investment flow will foster institutional development. Besides, economic growth provides for the required financial resources for the enhancement of governance, and may positively affect institutional development.[13] Therefore, the coefficients for trade openness and economic growth are expected to be positive.

Endogenous characteristics of the country including religious and ethnic tensions or internal

[12] Matthias Busse & Steffen Gröning. "Does Foreign Aid Improve Governance?." *Economics Letters* 104, no. 2 (2009): 77.
[13] Ibid., 77.

and external conflicts can also affect institutional development. It is expected that countries with higher rate of tensions and conflicts will have lower institutional quality, since resources that could be spent on improving governance are wasted on resolving conflicts and tensions. Ethnic tension variable assesses the degree of tension arising from racial, national, or language separations. Religious tension measures the degree of religious tension that stems from the domination of the society by a single religious group. For the aforementioned variables including religious and ethnic tensions and internal and external conflicts, lower ratings indicate higher tensions and conflicts.

A country with democratic government tends to have less corruption and stronger rule of law. For this reason, democratic accountability is expected have positive impact on institutional development. Democratic accountability measures not just whether there are free and fair elections, but how responsive government is to its people. Similarly, government stability, which measures the government's ability to stay in office and carry out its declared program, is expected to have positive impact on institutional development. Lastly, higher government consumption may be required for improving institutional quality, and it is expected that government consumption has positive association with institutional development.

VII. EMPIRICAL RESULTS

Table 1: Regression Results

Dependent Variable: Change in ICRG Value			
Independent Variables	**(1)**	**(2)**	**(3) GLS**
Initial ICRG			-3.313
			(0.358)***
TA/GDP (%)	0.08	0.047	0.089
	(0.045)*	(0.059)	(0.030)***
ODA/GDP (%)		0.02	
		(0.012)*	
Population Growth	-0.139	-0.152	-0.082
	(0.074)*	(0.075)**	(0.038)**
GDP Growth	-0.006	-0.009	-0.001
	(0.009)	(0.01)	(0.005)
Trade/GDP (%)	-0.002	-0.003	-0.004
	(0.003)	(0.003)	(0.002)*
School enrollment	-0.009	-0.01	-0.004
	(0.007)	(0.007)	(0.004)
Democratic Accountability	0.428	0.434	0.303
	(0.045)***	(0.046)***	(0.026)***
Ethnic Tension	0.325	0.346	0.356
	(0.061)***	(0.062)***	(0.037)***
Religious Tension	0.206	0.198	0.193
	(0.062)***	(0.062)***	(0.046)***
Conflict	0.06	0.064	0.102
	(0.021)***	(0.021)***	(0.012)***
Government Stability	0.096	0.096	0.055
	(0.033)***	(0.034)***	(0.020)***
FDI/GDP (%)	-0.002	-0.001	-0.003
	(0.013)	(0.013)	(0.007)
Government Consumption/GDP (%)	0.04	0.037	0.034
	(0.014)***	(0.014)***	(0.008)***
Constant	-4.481	-4.476	24.503
	(0.625)***	(0.630)***	(3.099)***
R^2	0.35	0.35	
Observations	1,131	1,114	1,131

Note: The quantities in parentheses below the estimates are the standard errors. ***, **, * indicate significance at, or below, 1, 5, 10 percents respectively. All specifications include time dummies, while (3) GLS includes country dummies as well as time dummies.

Equations (1) and (2) present the results from OLS Fixed Effects method, whereas equation (3) illustrates the result from Feasible-GLS method. All of the equations control for unobserved country fixed effects and time-specific factors. According to equation (1), technical assistance has a positive impact on institutional development at 10% significance level. As TA/GDP increases by one percent, the change in ICRG increases by 0.08. The coefficient for technical assistance is two times larger than that for government consumption. This may imply that spending on technical assistance increases the institutional quality of the country by larger degree than spending on public expenditure. When ODA/GDP (%) is included in equation (2) as one of the control variables, the positive impact of technical assistance becomes statistically insignificant. This may result from the high correlation between ODA and technical assistance.

Table 2: Correlation Coefficient between Technical Assistance and ODA

Correlation Coefficient	TA/GDP	ODA/GDP
TA/GDP	1.00	-
ODA/GDP	**0.67**	1.00

Table 2 shows the high correlation coefficient between technical assistance and ODA, which amounts to 0.67. Due to the high correlation between technical assistance and official development assistance, it may be difficult to uncover the partial effect of technical assistance when ODA is included in the model.

Equation (3) controls for heteroskedasticity by using FGLS method. Country dummies are included along with time dummies in order to control for country-fixed effects. While time-invariant variables, such as initial ICRG value, are omitted from the fixed-effects model, these variables can be included in the FGLS method. As shown in equation (3), the initial

ICRG value has a negatively significant effect on institutional quality. In other words, countries with initially higher ICRG value tends to have lower changes in ICRG value. This can be explained by the limited opportunities of the high-rating countries in improving their scores.

The statistical findings also show that endogenous variables are significant factors that improve governance. Especially, lower level of ethnic and religious tensions or external and internal conflicts lead to higher institutional quality. Besides, higher democratic accountability and government stability leads to institutional development. As previously explained, larger number of population means that there are greater numbers of people to make reforms. At the same time, larger population may signify that it is harder to reach consensus and thus more difficult to have institutional development. The result suggests that the latter effect is stronger and population growth has negative impact on institutional development. Government consumption, which represents the country's fiscal policy, also has a positively significant impact on institutional development. Interestingly, this paper was not able to prove any significant impact of economic growth, trade openness or FDI on institutional development.

Even though a number of control variables are included in the model, there exist possibilities for endogeneity problem. For instance, donors may provide technical assistance to countries with higher institutional quality. In order to control for the afore-mentioned problem, the lagged ICRG value is included in the following model. At the same time, Burnside and Dollar (2000) argue that aid is more effective under good policies. The following model also includes an interaction term between technical assistance and initial ICRG value to find out if the effectiveness of technical assistance also depends on the institutional quality.

Table 3: Regression Results

Dependent Variable: Change in ICRG Value					
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5) GLS**
$ICRG_{(T-1)}$	0.684	0.743	0.66	0.662	0.669
	(0.029)***	(0.024)***	(0.029)***	(0.029)***	(0.025)***
$ICRG_{(T-2)}$	-0.138	-0.14	-0.144	-0.144	-0.129
	(0.027)***	(0.022)***	(0.027)***	(0.027)***	(0.021)***
TA/GDP (%)	0.051	-0.202	-0.492	-0.516	-0.362
	(0.033)	(0.050)***	(0.121)***	(0.151)***	(0.050)***
TA^2				0.001	
				(0.007)	
ODA/GDP (%)		-0.006	0.002	0.002	0.008
		(0.003)**	(0.009)	(0.009)	(0.005)*
Trade/GDP (%)	-0.001		-0.003	-0.002	-0.002
	(0.002)		(0.002)	(0.002)	(0.001)
School Enrollment	-0.007		-0.007	-0.012	-0.011
	(0.005)		(0.005)	(0.011)	(0.006)*
Democratic Accountability	0.207	0.183	0.218	0.219	0.127
	(0.034)***	(0.026)***	(0.035)***	(0.035)***	(0.021)***
Ethnic Tension	0.193	0.163	0.202	0.201	0.184
	(0.046)***	(0.035)***	(0.046)***	(0.046)***	(0.029)***
Religious Tension	0.047	0.081	0.062	0.063	0.033
	(0.046)	(0.035)**	(0.046)	(0.046)	(0.034)
Conflict	0.035	0.062	0.043	0.044	0.057
	(0.015)**	(0.011)***	(0.016)***	(0.016)***	(0.009)***
Government Stability	0.109	0.083	0.102	0.104	0.065
	(0.025)***	(0.019)***	(0.025)***	(0.025)***	(0.015)***
TA*(Initial ICRG)		0.035	0.072	0.074	0.049
		(0.008)***	(0.015)***	(0.016)***	(0.008)***
Constant	-6.423	-7.501	-6.344	-6.231	-9.082
	(0.435)***	(0.237)***	(0.435)***	(0.489)***	(0.425)***
R^2	0.63	0.7	0.64	0.64	
N	1,148		1,708	1,134	1,134

Note: The quantities in parentheses below the estimates are the standard errors. ***, **, * indicate significance at, or below, 1, 5, 10 percents respectively. All specifications include time dummies, while (5) GLS includes country dummies as well as time dummies.

Once the model controls for endogeneity problem by including ICRG values of the previous two years, technical assistance no longer has positive impact on institutional development. Equation (1) shows that technical assistance does not have statistically significant impact on institutional development. The change in the coefficient of technical assistance implies that technical assistance may have been provided to countries with higher institutional quality or some unobservable variables that positively affect institutional quality are positively correlated with the amount of technical assistance.

In order to investigate the effectiveness of technical assistance depending on the level of institutional quality in the initial period, which is 1990, an interaction term between technical assistance and initial ICRG variable was included in Table 3 (2), (3), (4) and (5). For the equations that include the interaction term, the coefficient for technical assistance does not have any significant meaning since the value indicates the impact of technical assistance on institutional quality for countries with zero initial ICRG value. Interestingly, the coefficient for the interaction term is positively significant, which implies that the effectiveness of technical assistance improves as the initial ICRG value increases.

Table 4: Summary of Initial ICRG Variable

Variable	Mean	Standard Deviation
Initial ICRG	7.421	2.995

Table 4 describes the mean value and standard deviation of initial ICRG variable for countries in the sample. In order to investigate the impact of technical assistance for countries with average level of initial ICRG, another test was conducted by subtracting the mean initial ICRG value from the interaction term between technical assistance and initial ICRG.

Table 5: Initial ICRG-Centered Result

Dependent Variable: Change in ICRG Value (OLS-FE)	
Initial ICRG-Centered	**Result**
$ICRG_{T-1}$	0.743
	(0.024)***
$ICRG_{T-2}$	-0.14
	(0.022)***
TA/GDP (%)	**0.06**
	(0.025)**
ODA/GDP (%)	-0.006
	(0.003)**
Democratic Accountability	0.183
	(0.026)***
Ethnic Tension	0.163
	(0.035)***
Religious Tension	0.081
	(0.035)**
Conflict	0.062
	(0.011)***
Government Stability	0.083
	(0.019)***
TA*(Initial ICRG-Centered)	**0.035**
	(0.008)***
Constant	-7.501
	(0.237)***
R^2	0.7
N	1,708

Note: The quantities in parentheses below the estimates are the standard errors. ***, **, * indicate significance at, or below, 1, 5, 10 percents respectively. All specifications include time dummies.

Table 5 shows that the impact of technical assistance on institutional development for countries with average-level of initial ICRG is 0.06. In other words, the change in ICRG value increases by 0.06 with a one-percent increase in technical assistance over GDP. This value is statistically significant at 5% significance level.

Table 6: Effectiveness of Technical Assistance Depending on Initial ICRG

Initial ICRG	High = 10.42	Low = 4.42
TA/GDP	0.166	-0.046
	(0.042)***	(0.024)*

Note: The quantities in parentheses below the estimates are the standard errors. ***, **, * indicate significance at, or below, 1, 5, 10 percents respectively. Regressions in Table 6 follow the same model specifications from that in Table 5.

Table 6 shows that the impact of technical assistance on institutional quality change depends on the initial level of institutional quality. For those countries that have initial institutional quality of one standard deviation above the mean value, one percent increase in technical assistance over GDP is likely to increase the institutional quality by 0.166. In contrast, for those countries where the initial level of institutional quality is one standard deviation lower than the mean value, one percent increase in technical assistance over GDP tends to decrease the institutional quality by 0.046.

Burnside and Dollar argues that countries with bad policies should be provided with technical assistance, since foreign assistance has a deteriorating effect on growth for countries with bad policies. However, the regression results of Table 6 show that technical assistance may have positive impact in countries with higher initial level of institutional quality, whereas technical assistance may have negative impact in countries with bad institutional quality. The result implies that technical assistance is not an adequate solution for countries with bad institutional quality.

In order to test if the result from Table 5 is robust when time lag was applied to technical assistance, another test was conducted using the following equation:

$$\Delta ICRG_{it} = ß_0 + ß_1 ICRG_{it-2} + ß_2 TA_{it-1} + yX_{it} + ƛ_t + Ɛ_{it}$$

Table 7: Time-Lag on Technical Assistance

Dependent Variable: Change in ICRG Value (OLS-FE)		
Independent Variables	**(1)**	**(2)**
$ICRG_{T-2}$	0.297	0.281
	(0.024)***	(0.024)***
TA_{T-1} (% of GDP)	**0.05**	-0.538
	(0.04)	(0.135)***
Population Growth	-0.064	-0.081
	(0.071)	-0.071
GDP Growth	-0.002	-0.004
	(0.009)	-0.009
Trade/GDP (%)	-0.001	-0.002
	(0.003)	-0.003
School Enrollment	-0.008	-0.008
	(0.006)	-0.006
Democratic Accountability	0.361	0.365
	(0.043)***	(0.042)***
Ethnic Tension	0.278	0.285
	(0.057)***	(0.057)***
Religious Tension	0.09	0.097
	(0.058)	(0.057)*
Conflict	0.067	0.071
	(0.020)***	(0.019)***
Government Stability	0.152	0.144
	(0.031)***	(0.031)***
Government Consumption	0.032	0.032
	(0.013)**	(0.013)**
TA_{T-1}* Initial ICRG		**0.077**
		(0.017)* **
Constant	-6.354	-6.232
	(0.608)***	(0.603)***
R^2	0.43	0.44
N	1,133	1,133

Note: The quantities in parentheses below the estimates are the standard errors. ***, **, * indicate significance at, or below, 1, 5, 10 percents respectively. All specifications include time dummies.

The regression result with one-year time lag on technical assistance is consistent with the previous findings from Table 5. The interaction term between technical assistance in the previous year and the initial ICRG value is positively significant at 5% significance level.

VIII. LIMITATIONS

OECD reports that poorer countries receive smaller share of technical assistance due to limited absorptive capacity. The report explains that technical assistance is concentrated in countries that are experiencing rapid economic transformation.[14] Since countries that are experiencing rapid transformation may have higher institutional quality, our estimator for technical assistance may be overvalued. In order to control for this endogeneity problem, this paper includes ICRG values in the previous two years and applies time lag on the technical assistance variable. Even though this approach can partially control for the endogeneity problem, an instrumental variable approach may be a more effective way.

The model can be improved in several ways to test the impact of technical assistance. First, the impact of technical assistance may vary according to the income level or location of the recipient countries. For this reason, the sample can be divided into several groups depending on their income level and region, and statistical tests can be conducted for each group. In addition, institution is a cluster of different components including corruption level, bureaucratic quality and rule of law. If it is possible to divide the technical assistance into different sub-categories, the effectiveness of technical assistances on anti-corruption, legal system, and economic management can be tested separately.

[14] OECD (2005). 117.

IX. CONCLUSION AND POLICY IMPLICATIONS

This paper has analyzed different studies that investigate the impact of technical assistance projects. Due to the unique nature of technical assistance, it is difficult to assess with precision the outcomes of technical assistance, which may frequently be indirect and have long time lags. For this reason, a theory-based impact evaluation method was developed by the international initiative for impact evaluation in order to evaluate technical assistance using quantitative indicators. For instance, the effectiveness of anti-corruption policy was evaluated through randomized control trials as the case in Indonesia demonstrated, and the study has proven that monitoring by the central government is most effective in reducing the level of corruption.

In order to improve the effectiveness of technical assistance programs, it is important for aid agencies to conduct rigorous impact evaluations of their programs. Unlike evaluations made by the IMF and World Bank, which only track the changes in technical capacities of individuals, the impact evaluation methods allow development practitioners to assess the program's impact on the intended objectives of the program. Besides, development practitioners may be able to identify the obstacles in achieving the intended results, and thus improve the effectiveness of technical assistance. In addition, effectiveness of different programs can be compared, such as the case study of anti-corruption policy, and the findings may provide valuable policy guidance to development practitioners.

At the same time, there exist many practical barriers when implementing the theory-based impact evaluation method. First of all, evaluators should participate in the program from the

beginning, and the cost of the program will rise substantially. In addition, due to the difficulties in quantifying the outcomes of technical assistance, innovative methods are needed such as the case in Indonesia. For example, Professor Olken measured corruption by finding the difference between expected and actual expenditure. Because of these practical barriers, donor countries may adopt less rigorous evaluation framework such as the Capacity Development Results Framework in the short-run, to measure the increased awareness and knowledge of stakeholders.

Furthermore, this paper has conducted regression analyses to measure the impact of technical assistance on governance and empirically found that technical assistance may have positively significant effect on institutional development for countries with average level of institutional quality. Also, the interaction term between institutional quality in 1990 and technical assistance is positively significant, which implies that the effectiveness of technical assistance may depend on the level of institutional quality. In other words, technical assistance may improve institutional quality for countries with high level of institutional quality from the beginning, whereas technical assistance may have negative impact in countries with bad institutional quality.

Even though technical assistance aims to improve the institutional capacity of recipient countries, technical assistance may not be an adequate solution for countries with bad institutional quality. Instead, endogenous factors, such as democratic accountability, ethnic tension, conflict and government stability, have significant impact on institutional development. Indeed, as mentioned in the IMF evaluation report of technical assistance programs, political will and country-specific contexts are the most important factors to translate the improved capacities of public officials into actual policy or institutional reform.

APPENDICES

X. APPENDIX

1. Country Coverage of the Data Set

Albania	Guatemala	Oman
Algeria	Guinea	Pakistan
Angola	Guinea-Bissau	Panama
Argentina	Guyana	Papua New Guinea
Armenia	Haiti	Paraguay
Azerbaijan	Honduras	Peru
Bangladesh	India	Philippines
Belarus	Indonesia	Senegal
Bolivia	Iran, Islamic Rep.	Serbia
Botswana	Iraq	Sierra Leone
Brazil	Jamaica	South Africa
Burkina Faso	Jordan	Sri Lanka
Cameroon	Kazakhstan	Sudan
Chile	Kenya	Suriname
China	Lebanon	Syrian Arab Republic
Colombia	Liberia	Tanzania
Congo, Dem. Rep.	Libya	Thailand
Congo, Rep.	Madagascar	Togo
Costa Rica	Malawi	Trinidad and Tobago
Cote d'Ivoire	Malaysia	Tunisia
Croatia	Mali	Turkey
Cuba	Mexico	Uganda
Dominican Republic	Moldova	Ukraine
Ecuador	Mongolia	Uruguay
Egypt, Arab Rep.	Morocco	Venezuela, RB
El Salvador	Mozambique	Vietnam
Ethiopia	Namibia	Yemen, Rep.
Gabon	Nicaragua	Zambia
Gambia, The	Niger	Zimbabwe
Ghana	Nigeria	

2. Summary Statistics of Variables

Variable	Observation	Mean	Std. Dev.	Min	Max
Recipient	1869	45	25.697	1	89
Year	1869	2000	6.057	1990	2010
TA/GDP (%)	1829	1.281	1.887	-0.308	20.533
Initial ICRG	1797	7.421	2.995	1.083	14.5
Total ICRG	1797	8.075	2.470	0.750	16.167
Change in ICRG	1821	0.646	2.917	-7.750	9.500
ODA/GDP (%)	1755	6.942	12.065	-0.730	181.014
Population Growth	1869	1.783	1.172	-5.814	11.181
GDP Growth	1841	3.797	6.776	-51.031	106.280
Trade/GDP (%)	1783	72.879	36.075	10.831	280.361
School enrollment	1257	58.834	26.897	5.056	111.181
Democratic Accountability	1797	3.346	1.402	0	6
Ethnic Tension	1797	3.777	1.392	0	6
Religious Tension	1797	4.399	1.358	0	6
Conflict (Internal + External)	1797	18.139	3.523	1.5	24
Government Stability	1797	7.966	2.123	1	12
FDI	1803	3.352	7.480	-82.892	144.516
Government Consumption	1768	14.067	5.894	2.047	45.263
TA * (Initial ICRG)	1779	8.736	12.601	-1.232	98.777

3. Hausman Test for Fixed Effects vs. Random Effects Model

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
tagdp	.1688966	.1761542	-.0072576	.0142268
tasq	-.0073171	-.0077244	.0004073	.0007095
netodarece~i	-.0524196	-.0566924	.0042727	.0038976
odasq	.0014267	.0014306	-3.97e-06	.0000284
population~l	-.141065	-.1332009	-.0078641	.0106497
gdpgrowtha~l	-.014741	-.0135562	-.0011847	.
tradeofgdp	-.004205	-.0034	-.000805	.0010231
industryva~p	.007861	.0050002	.0028608	.0017164
schoolenro~s	-.0389039	-.0357714	-.0031324	.0016039
democratic~y	.3924529	.3861222	.0063307	.0061894
ethnictens~n	.4357135	.4358094	-.000096	.0131231
religioust~n	.2678149	.2342919	.033523	.0128486
conflictex~l	.1146536	.1104597	.0041939	.0008082
stability	.0215177	.0153264	.0061913	.0025397
fdi	-.0057874	-.0052744	-.000513	.0012031
inflation	.0000196	.0000192	3.86e-07	.
government~n	.0501827	.0441025	.0060802	.0039074

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 44.02
Prob>chi2 = 0.0003
(V_b-V_B is not positive definite)

The null hypothesis for the Hausman test is rejected, which signifies that there are systematic differences in the coefficients for fixed effects and random effects models. As a result, fixed effects model should be used in order to control for country-specific effects.

4. Likelihood-Ratio Test

Likelihood-ratio test LR chi2(85) = 479.97
(Assumption: . nested in hetero) Prob > chi2 = 0.0000

The null hypothesis for the likelihood-ratio test is rejected, which signifies that the error terms are not homeskedastic. The model is tested using Feasible-GLS method in order to control for heteroskedasticity problem.

5. Data Source

Variable	Data Source
TA/GDP (%)	World Bank Databank
ICRG	PRS Group
ODA/GDP (%)	World Bank Databank
Population Growth	World Bank Databank
GDP Growth	World Bank Databank
Trade/GDP (%)	World Bank Databank
School enrollment	World Bank Databank
Democratic Accountability	PRS Group
Ethnic Tension	PRS Group
Religious Tension	PRS Group
Conflict (Internal + External)	PRS Group
Government Stability	PRS Group
FDI	World Bank Databank
Government Consumption	World Bank Databank

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