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Development Effectiveness of the Paris Declaration: An Empirical Evaluation

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파리선언의 개발효과성: 실증적 평가

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ABSTRACT

This study aims to assess the development effectiveness of the Paris Declaration (2005). Using data collected by the OECD/DAC from 78 developing countries for the period 2005~2010, this study evaluates the role played by the Paris Declaration principles alone and in interaction with aid in promoting per-capita GDP growth.

The analysis shows that the overall net impact of aid on promoting economic growth has been negative. However, aid effectiveness has been enhanced by the sound policies or institutions and some Paris Declaration (PD) principles. Of the five principles of the PD, only the alignment and, to some extent, mutual accountability principles of the PD did show a significant and positive role in making aid more effective for economic growth of aid recipient countries. Therefore, OECD's statement that the PD enhances aid effectiveness is supported only partially.

These findings have significant implications for the importance accorded to sound policies and institutions in the growth literature, and for future international development cooperation agenda.

본 연구는 파리선언(2005)의 개발효과를 평가하는 것을 목적으로 한다. 구체적으로 말하면, OECD/DAC가 78개의 개도국으로부터 수집한 2005~10년 기간의 자료를 이용하여, 파리선언의 여러 원칙이 독자적으로 또는 원조와의 상호작용을 통하여 1인당 국민소득의 성장에 기여한 정도를 평가한다.

본 연구의 결과에 의하면, 원조가 독자적으로 국민소득의 증가에 기여한 효과는 부정적이다. 그러나 건전한 정책과 제도가 있는 개도국 또는 파리선언의 몇 가지 원칙이 실시된 국가에서는 원조의 효과가 긍정적이었다. 파리선언의 다섯 가지 원칙 중에서 오직 원조가 개도국의 개발전략과 계획에 연계되어야 한다는 원칙이 적용된 경우와 원조공여국–수원국 상호 간에 상호책임의 원칙이 적용된 경우에는 원조가 경제성장에 긍정적이며 유효한 영향을 미쳤다는 것을 보여준다. 따라서 파리선언의 원칙들이 원조의 효과성을 제고한다는 OECD의 주장은 오직 부분적으로만 실증된 셈이다.

원조와 파리선언의 개발효과에 관한 이러한 실증적 분석 결과는 건전한 제도나 정책이 경제성장에 중요하다는 경제학 문헌의 주장과 앞으로의 국제개발협력의 논의과제에 주는 의미가 크다.

I. Introduction

This paper aims to evaluate the impact of the Paris Declaration on Aid Effectiveness. In particular, it examines the claim that adopting the declaration's principles helps promote developing countries' economic growth.

At the Second Hi-Level Forum on Aid Effectiveness in Paris (2005), more than 180 Ministers of developed and developing countries responsible for promoting development and Heads of multilateral and bilateral development agencies resolved to take far-reaching reform of the ways they deliver and manage aid. They also agreed on 12 action indicators and targets to be attained by 2010. OECD claims that this Declaration builds on the lessons learned over many years about what works. It also claims that donors and recipients are committed to adopt the best policies and principles in aid management to increase the impact that aid has in reducing poverty and inequality, and increasing growth of developing countries (OECD, 2009).

The Declaration incorporated five principles: establishment of the country ownership of development policies and strategies; alignment of donor aid to developing countries' priorities and systems in a predictable and transparent manner; donor efforts to harmonize aid practices; results-oriented aid management; and mutual accountability by both donors and recipients (Paris High Level Forum, 2005).

In preparation for the Fourth High Level Meeting on Aid Effectiveness in Busan (2011), the OECD published a progress report on the Paris Declaration's implementation. It said that considerable progress had been made toward many of the 12 targets, with one (ownership) being fully met, and noted significant variation in the direction and pace of progress among donors and recipients (OECD, 2011).

However, as yet, there have been no evaluation studies of the Paris Declaration's impact on either poverty reduction or economic growth. Moreover, the OECD's claim that adoption of the Declaration's five principles of aid management would promote economic growth and reduce poverty and inequality has never been tested empirically. This study aims to fill this gap in aid effectiveness debates and determine whether the Paris Declaration has made any positive contribution to aid effectiveness and achievement of the Millennium Development Goals. Such evaluation is important when post-MDG policies and strategies are being actively discussed by both developed and developing country governments, as well as international development agencies. If the five principles of the Paris Declaration were proved to be effective in promoting aid effectiveness and economic growth,

they could be credited to continue playing important role in the post-MDG era. However, to date there has been no empirical proof that the Paris Declaration has facilitated aid effectiveness. Moreover, until the Paris Declaration was agreed upon in 2005, there had been running debates in the literature on aid effectiveness or on the causes of aid ineffectiveness. These topics are still one of the most hotly debated subjects in the literature of development economics. Therefore, this study evaluates empirically whether the Paris Declaration has actually facilitated aid's impact on development.

The rest of this paper is organized as follows: the second section reviews the literature on aid effectiveness, highlighting the significance of the Paris Declaration in quelling the debate over aid management; the third section describes the method and data of the empirical test adopted in this study; the fourth section discusses the findings of the empirical evaluation; and the last section provides concluding remarks and recommendations.

II. Literature Review

Numerous empirical studies have confirmed that economic growth is necessary for sustained improvement of human welfare and poverty reduction (Dollar and Kraay, 2002). Consensus seems to have been largely achieved on the positive role played for economic growth by investment in fixed assets, human capital, policies and institutions, trade, and foreign direct investment. However, scholars disagree on other causes of economic growth.

One dispute is over whether foreign aid can spur developing countries' economic growth. Cross-country studies have tended to yield ambiguous, sometimes even conflicting results. They also differ in the econometric specifications used, the number of years covered in the analysis, the independent variables included, and the number of countries investigated in the studies. Time-series country studies also failed to produce any conclusive results. Both cross-country and time-series literature on aid effectiveness can be divided into two groups: one which argues in favor of aid effectiveness, and the other which argues against aid effectiveness (Hussen and Lee, 2012).

1. Studies in Favor of Aid Effectiveness

The studies that favor aid effectiveness for economic growth are represented by

Papanek (1973), Hansen and Tarp (2000 and 2001), Dalgaard and Hansen (2001), Gomanee *et al*. (2005), and Arndt *et al*. (2010). The most controversial studies are the ones made by the World Bank (1998) and Burnside and Dollar (2000). These studies show that aid is ineffective for per-capita GDP growth in general, but is effective in a sound policy and institutional environment. In other words, aid alone is not effective for economic growth, but becomes effective when it interacts with sound policies

Critics argued that these studies' results are very much dependent on the data and specifications of estimation models and that the policy concept is too narrow (Hansen and Tarp, 2000 and 2001; and Easterly *et al*., 2003). However, these results, particularly the significant and positive aid-policy interaction effects, are reconfirmed even with a broader concept of policy (i.e., CPIA), refined aid data, and specifications (Collier and Dollar, 2002). On the basis of these reconfirmed results, the Collier and Dollar study demonstrates that assistance would be more effective if more aid were allocated to countries with lower income and sounder policies. Later studies such as Clemens *et al*. (2004) find that aid effectiveness is not conditional on policies, but that aid becomes more effective in developing countries with sounder policies and higher levels of human capital accumulation.

The Paris Declaration principles are a kind of sound policies and institutions for managing aid and aid relationships. Therefore, this study evaluates whether aid becomes effective or more effective when aid donors and recipients have adopted the Paris Declaration principles as part of sound policies and institutions.

2. Studies Against Aid Effectiveness

The studies that argue against aid effectiveness can be divided into three subgroups by the identified causes of ineffectiveness. The first argues that aid is ineffective due to conditions and constraints in developing countries; the second blames the very nature of the donor-recipient relationship; and the third targets the constraints and incentive systems of donor countries (Paul, 2006). They argue that each of these factors prevents aid from being placed in investment or consumption that can be used effectively for growth and poverty reduction.

A. Recipient Constraints

Boone (1996) investigated the impact of foreign aid on investment, consumption, and measures of well-being of 91 countries for the period 1971~1990. He found that aid increased consumption more than investment and growth. Boone argued that the

current political regimes in recipient countries prevent aid from being an effective tool for promoting growth, and that a liberal political regime is important for growth promotion and poverty reduction through aid. Since government is not representative and serves particular interest groups (through distortionary taxes), aid becomes distorted to serve the interest groups. Therefore, poverty reduction and human development do not improve. Other studies follow more or less the same line of argument (Adam and O'Connell, 1999; Pedersen, 1995; Svensson, 2000; Lahiri and Raimondos-Møller, 2004).

Ovaska (2003) studied 86 developing countries over the period 1975~1998 and found a negative relationship between aid and economic growth mainly because the aid-policy interaction term turned out to be consistently negative. In other words, giving more aid to countries with good policies and institutions worked against economic growth. The author suspects that aid may have played a role against the work efforts of the recipient countries or donors must have tied the use of the aid against growth. In contrast to earlier studies, the author used a broader measure of policy and institution, two alternative concepts of aid, and a fixed effect least squares model.

Rajan and Subramanian (2005 and 2007) also failed to find any positive effects of aid on economic growth in the short and medium terms, and even found a negative relationship in the long run. They suspect that aid might reduce the quality of governance since aid inflows might reduce the need for governments to tax the governed or enlist their cooperation.

B. Agency Problems in Aid Relationship

Kanbur and Sandler (1999) and other studies (Azam and Laffont, 2003; Dixit, 2003; Laffont and Martimort, 2002; Martens *et al*., 2002; Seabright, 2002) argue that as with a principal and agent contract, a donor and recipient relationship produces conflicting views on the objective of aid (desirability of poverty reduction), divergent interests, and asymmetric information. Consequently, donors and recipients typically have mismatched incentives, broken information feedback, and a reluctance to collaborate toward institutional reform.

To overcome such a dysfunctional relationship, the studies suggest that conditionality be used in all types of aid, or that all bilateral aid be pooled and entrusted to a multilateral aid agency for objective and optimal allocation to all eligible developing countries (Kanbur, 2003). However, records have shown problems with conditionality aid: donor-designed projects depriving recipients of ownership, moral hazards and adverse selection, cooperation among donors producing crowding-out effects, weakening donors' commitment, incomplete

enforcement of conditionality, and ultimately shaken credibility of conditionality (Svensson, 2003; Pedersen, 2001).

Therefore, some studies argue for ex-post conditionality in contrast to traditional ex-ante conditionality, favoring aid for sector and budget support programs, or linking aid allocations to observed outputs or results (Adam *et al*., 2004; Nissanke, 2008). Without a doubt, aid with ex-post conditionality enhances the predictability of aid allocations, ownership of recipients, and sounder donor-recipient relationships. However, performance-based aid allocations and aid with ex-post conditionality also have encountered problems with recipients' limited absorptive capacity and have created a high level of aid volatility (Eifert and Gelb, 2005).

C. Donor's Constraints

Alesina and Dollar (2000) attribute aid ineffectiveness to historical relations, such as that of a donor country to a former colony, and to donors' strategic behaviors. The strategic behaviors include not only exchange of political gifts by governments at international negotiations (Lundborg, 1998), but also enterprises' lobbying activities to pursue economic and commercial interests in recipient countries (Villanger, 2006). Some studies attribute aid ineffectiveness to the failure of bureaucracy in allocating aid optimally and closely monitoring and evaluating execution of aid projects and programs (Easterly, 2003).

D. Paris Declaration on Aid Effectiveness

Adoption of the Paris Declaration on Aid Effectiveness in 2005 was based on the realization that aid ineffectiveness was caused by a combination of failures on the part of both donors and recipients. Such realization was fostered through discussions at the First High Level Forum on Harmonization in Rome in 2003 and at the Roundtable on Managing for Development Results in Marrakech in 2004.

As mentioned before, the Paris Declaration incorporated five principles derived from the past failures of both donors and recipients. The principles sought to encourage both donors and recipients to collaborate on enhancing aid effectiveness and be mutually accountable on aid management. These principles of the Paris Declaration takes into account the earlier argument that emphasized the agency problem in the donor-recipient relationship. Recipients are urged to take greater ownership of development policies and strategies; donors are urged to coordinate and harmonize aid efforts with recipients and other donors. These principles of the Paris Declaration aim to overcome the past criticisms that highlighted either only the recipients' constraints or only the donors' problems.

Under the OECD's auspices, more than 180 representatives of donors and

recipients established 12 indicators and action targets to be achieved by 2007 and 2010 to assess progress on the five principles of the Paris Declaration. These 12 indicators were: operational development strategies, reliable public financial management systems, reliable procurement systems, alignment of aid flows with national priorities, coordinated support, use of recipient-country public financial management systems, use of recipient-country procurement systems, avoidance of parallel project implementation, aid predictability, untied aid, use of common arrangements or procedures, joint missions and joint country analytic work, results-oriented frameworks, and mutual accountability.

In the end, 78 countries voluntarily agreed to participate in the monitoring program, and the monitored results were published at the mid-term review in 2008 (Clay *et al*., 2008) and the completion review in 2011 (OECD, 2011). The OECD promoted the Declaration, saying that it enhances aid effectiveness and contributes to the achievement of the Millennium Development Goals. Unfortunately, one critical shortcoming of the Declaration is that more than eight years after the launch of the Paris Declaration, there has been no evaluation of the agreement's impact on either economic growth or poverty reduction through aid.

Such an assessment can be made by following the methods and procedures of the proponents of aid effectiveness. The hypothesis to be tested is that aid is ineffective in general, but is effective in an environment where the five principles of the Paris Declaration are prevalent. An alternative hypothesis is that aid is effective in general, but is more effective in an environment where the Paris Declaration principles are actively practiced. To test these hypotheses, we can also adopt a growth equation that includes not only aid, but also an interactive term between aid and the Paris Declaration Indicators, following the precedent analyses with an interactive term between aid and policy (Burnside and Dollar, 2000; Collier and Dollar, 2002).

Another shortcoming of the Paris Declaration is that it does not include any principles related to the rational or optimal allocation of aid. Although several studies have pointed out irrational or suboptimal aid allocation practices for historic, strategic, or commercial reasons (Alensina and Dollar, 2000), the Paris Declaration does not include any principles that can serve to improve this area. Some studies bear out the trend of more selective aid allocations in line with optimal aid allocation criteria since the end of the Cold War (Dollar and Levin, 2004; Bandyopadhyay and Wall, 2007). However, more recent studies show that suboptimal aid allocation practices are still rampant (Lee, 2012a and b). If the aid allocation is distorted at the early stage of an aid cycle, no efforts to improve aid management at later stages will be able to enhance aid effectiveness much.

III. Empirical Evaluation Method and Data

The basic specification of the growth equations used in this study is as follows:

$$gPCGDP_{it} = a + b_1\, IPCGDP_{it} + b_2\, (Inv/GDP)_{it} + b_3\, HC_{it} + b_4\, (Export/GDP)_{it} + b_5\, (FDI/GDP)_{it} + b_6\, (Aid/GDP)_{it} + b_7\, (Aid/GDP)_{it}^2 + b_8\, CPIA_{it} + b_9\, (Aid/GDP)_{it} * CPIA_{it} + b_{10}\, ICRG_{it} + b_{11}\, (Aid/GDP)_{it} * ICRG_{it} + b_{12}\, Pop_{it} + b_{13}\, PD_{it} + b_{14}\, (Aid/GDP)_{it} * PD_{it} + e_{it} \quad (1)$$

$$gPCGDP_{it} = a + b_1\, IPCGDP_{it} + b_2\, (Inv/GDP)_{it} + b_3\, HC_{it} + b_4\, (Export/GDP)_{it} + b_5\, (FDI/GDP)_{it} + b_6\, (Aid/GDP)_{it} + b_7\, (Aid/GDP)_{it}^2 + b_8\, CPIA_{it} + b_9\, (Aid/GDP)_{it} * CPIA_{it} + b_{10}\, ICRG + b_{11}\, (Aid/GDP)_{it} * ICRG_{it} + b_{12}\, Pop_{it} + b_{13}\, PD\text{-}1_{it} + b_{14}\, (Aid/GDP)_{it} * PD\text{-}1_{it} + b_{15}\, PD\text{-}2_{it} + b_{16}\, (Aid/GDP)_{it} * PD\text{-}2_{it} + b_{17}\, PD\text{-}3_{it} + B_{18}\, (Aid/GDP)_{it} * PD\text{-}3_{it} + b_{19}\, PD\text{-}4_{it} + b_{120}\, (Aid/GDP)_{it} * PD\text{-}4_{it} + b_{21}\, PD\text{-}5_{it} + b_{22}\, (Aid/GDP)_{it} * PD\text{-}5_{it} + e_{it} \quad (2)$$

where
i and t: country and year (during 2005~2010),
gPCGDP: growth rates of per capita real GDP in constant 2005 US $ prices,
IPCGDP: initial per capita real GDP in constant 2005 US $ prices,
Inv/GDP: the ratio of investment to GDP (%),
HC: the secondary education enrollment rate (% of age group) as a proxy for human capital,
Aid/GDP: the ratio of Aid to GDP (%) where Aid is defined as official development assistance,
$(Aid/GDP)^2$: square of Aid/GDP,
CPIA: proxy index of macroeconomic and social protection policies,
(Aid/GDP)∗CPIA: an interactive term between the aid ratio and policy,
ICRG: proxy index of the institutional quality,
(AID/GDP)∗ICRG: an interactive term between the aid ratio and institutional quality,
Pop: population growth rate,
Export/GDP: the ratio between exports and GDP (%),
FDI/GDP: the ratio between FDI inflows and GDP (%),
PD: a composite index of Paris Declaration principles (%), which is a simple

average of five subcomponent indexes: PD-1, PD-2, PD-3, PD-4, and PD-5,
(Aid/GDP)∗PD: an interactive term between the aid ratio and the PD,
PD-1: the Paris Declaration Indicator for the ownership principle (%),
PD-2: the Paris Declaration Indicator for the alignment principle (%),
PD-3: the Paris Declaration Indicator for the harmonization principle (%),
PD-4: the Paris Declaration Indicator for the results principle (%),
PD-5: the Paris Declaration Indicator for the mutual accountability principle (%),
(Aid/GDP)∗PD-1: an interactive term between the aid ratio and PD-1,
(Aid/GDP)∗PD-2: an interactive term between the aid ratio and PD-2,
(Aid/GDP)∗PD-3: an interactive term between the aid ratio and PD-3,
(Aid/GDP)∗PD-4: an interactive term between the aid ratio and PD-4,
(Aid/GDP)∗PD-5: an interactive term between the aid ratio and PD-5,
e: an error term.

Since the main objective of aid (Official Development Assistance: ODA) in this millennium era is understood as poverty reduction, the development effectiveness of the Paris Declaration should also be explored from the poverty reduction point of view. However, this study focuses on the economic growth objective of aid for two reasons. First, although poverty can be reduced by aid for delivering consumption goods directly to the poverty group, a more sustainable way of reducing poverty is to use aid for investment to promote pro-poor growth of the whole economy including the poverty group. Second, an effective way of exploring the development effect of the Paris Declaration is to collect data from the countries, which participated voluntarily in the monitoring and evaluation process of the Declaration. However, poverty indicators are not uniformly defined and compiled in those participating countries for every year. In terms of data, it is much easier and more reliable to compare the economic growth performance of the participating countries. Therefore, this study focuses on exploring the economic growth effects of the Paris Declaration.

The growth equations as specified above draw on the large empirical literature on growth. Of course, the current literature on growth, especially the cross-country regression method for accounting growth, has several limitations. First, the cross-country regressions typically include control variables (such as investment and human capital) that are associated with transition dynamics as well as with steady-state income, making it hard to say that the magnitude of the coefficient on initial income picks up all transition dynamics. Second, the models do not use observable control variables that will fully capture differences in steady states. Third, the

control variables (for example, aid) often cannot avoid the endogeneity problem vis-à-vis growth (Klenow and Rodriguez-Clare, 1997). However, the main concern of this study is not to account for the speed of growth or convergence, but to explore the contribution of the Paris Declaration principles to aid effectiveness in promoting growth. Therefore, this study simply takes advantage of the cross-country regression method, accepting its limitations and avoiding the main controversy among different growth models. This study does not use the pure cross-country regression method, but adopts a cross-country and time-series panel regression method, controlling for differences in steady states among countries. Also, this study use proper econometric techniques to avoid the edogeneity problem between some control variables and growth.

The two equations above allow growth rates during the study period to depend on the initial level of GDP per capita, so that the model can measure the conditional rate of conversion of the economy to its long-run steady-state position. Based on the neo-classical economic growth model, the coefficient on this variable is expected to be negative, i.e., the higher the initial income level, the lower the growth rate.

The general strategy of the model is to account for policy and institutional distortions in developing countries in view of the emphasis placed on these factors in the growth literature. For this purpose, this study uses the Country Performance and Institution Assessment (CPIA) and the International Country Risk Guidance (ICRG) Indexes. The CPIA index measures soundness of macroeconomic and social protection policies of a country. The CPIA, compiled by the World Bank, has 20 equally weighted components, each ranking all countries ordinally from one through six, which indicates the best performance. This policy index is expected to show positive effects on growth, as in the earlier empirical studies (Burnside and Dollar, 2000; Collier and Dollar, 2002).

The International Country Risk Guide (ICRG), which captures the institutional quality, measures long-term characteristics of a country that affect both growth performance and policy. This study adds only three scores among many sub-categories of the composite index: corruption (0~6 scores), law and order (0~6 scores), and bureaucracy quality (0~4 scores). All three components are clearly linked to governance, highly relevant for development issues, and scaled so that a higher level indicates a better quality. Like the policy variable, this institutional quality variable is expected to show positive effects on growth, as in the earlier studies. Another such explanatory variable is population growth rates, which may affect per capita GDP growth either negatively or positively.

The growth equations above include three additional independent variables, which have not usually been included in earlier empirical growth literature. They are

investment ratios, secondary school enrollment rates, export ratios, and FDI ratios. The neoclassical growth theory identifies these variables as important determinants of growth. Increases in the investment ratios will expand capital available per capita, the higher secondary school enrollment rates will indicate the higher skill level of the population and total productivity, and the rising export ratio and FDI ratio will increase not only availability of resources needed for investment, but also technological diffusion (Barro and Sala-i-Martin, 1995; Barro, Mankiw, and Sal-i-Martin, 1995; Lucas, 1988; Romer, 1990; and Klenow and Rodriguez-Clare, 1997). Therefore, their inclusion in the growth equations will reduce the potential bias in the estimation of coefficients by limiting the omitted variables, and these variables are expected to show positive effects on growth.

The sign of the Aid variable (Ai/GDP) in this study is uncertain in view of the hot debate among development economists and the varying results of existing empirical studies. However, the sign of the aid square variable would be negative, as several previous studies show. An ever increasing amount of aid beyond the absorptive capacity of the recipient countries would result in a diminishing return to aid on economic growth.

The main focus of the growth equations in this study is the interactive terms. As in earlier studies, especially by Burnside and Dollar (2000) and Collier and Dollar (2002), the growth equations above include an interactive term between aid and policy: (Aid/GDP)*CPIA. In addition, they include an interactive term between aid and institutional quality: (Aid/GDP)*ICRG. The rationale for these interactive terms is that aid may not be effective by itself, but may become effective in a sounder policy and institutional quality environment. For the same reason, the growth equations of this study include an interactive term between aid and PD. Aid may not be effective by itself; however, as the OECD has stated, aid would become effective with an increasing level of the PD indicators, as PD is a part of sound policies and institutions. Therefore the interactive term would show a positive sign.

In growth equation (1), the PD is a simple average of the five-PD principle indicators, representing the degree of: (i) ownership of aid recipients (PD-1); (ii) alignment of donor's aid with recipient's development strategy, investment programs, and public finance and procurement systems (PD-2); (iii) harmonization of aid programs and activities among donors (PD-3); (iv) result-orientation of aid management by both donors and recipients (PD-4); and (v) mutual accountability between donors and recipients (PD-5). Like policy and institution variables in the earlier studies, this Paris Declaration Index variable is expected to have positive effects on per capita income.

In growth equation (2), the PD is disaggregated into five subcomponents,

following the five principles of the Paris Declaration. Both the composite PD Index and five disaggregated PD Indexes are drawn from the "Aid Effectiveness 2005~ 2010: Progress in Implementing the Paris Declaration" (OECD, 2011), which was prepared by the OECD/DAC Working Party on Aid Effectiveness. The report is based on the findings of the 2011 Survey on Monitoring the Paris Declaration, which was conducted with support from donor organizations, participating country governments, and civil society organizations regarding the 12 monitoring indicators of the Paris Declaration in each of the participating countries. A total of 78 countries and territories participated in the 2011 survey, compared with 55 countries in 2008 and 34 countries in 2006 surveys. The data are expressed in percentages; however, some monitoring indicators (1, 2a, 2b, and 11) are assessed on an alphabetic or numeric scale, which are converted into percentages for consistency and comparability in this study, as follows: "A" = 90%, "B" =80%, "C" =70%, "D" = 60%, and "E" =50%. Likewise, "4.5" =90%, "4" =80%, "3.5" =70%, "3" =60%, "2.5" =50%, "2" =40%, and "1.5" =30%.

The growth equations as specified above can be estimated by several econometric methods, such as pooled OLS, Fixed Effect, Random Effect, and Hausman-Taylor analyses. The pooled OLS analysis can be biased due to unobserved individual factors. Thus, the Fixed and Random Effect analyses would be better estimation methods with the cross-section and time-series panel data. The Fixed Effect analysis is a more appropriate than the Random Effect analysis when the unobserved factors are correlated with explanatory variables. However, the Fixed Effect analysis cannot offer estimations for time-invariant variables. The Random Effect analysis makes a more efficient estimation when the unobserved individual factors are uncorrelated with explanatory variables. Therefore, the Hausman-Taylor analysis can be a better alternative. It can not only offer an estimation of the coefficient of the time-invariant variables, but also offer an efficient estimate even when the unobserved individual factors (u_i) are correlated with the explanatory variables, as long as the explanatory variables are uncorrelated with the idiosyncratic error (e_{it}). Moreover, it has an additional advantage. It can estimate the growth equation by controlling potential endogeneity between the dependent variable and some explanatory variables, such as the aid variable and the interactive terms between aid and policy or institution variables. It can test whether the estimation properly excluded those variables as instruments or not with a Chi square test.

The growth equations were estimated, using the data from 78 developing countries over the period 2005~2010. Sources for the data are summarized in <Appendix Table 1>, and a summary of the statistics is provided in <Appendix

Table 2>. Data for the variables included in the growth equations are mostly obtained from the World Bank's World Development Indicators, except for the PD index and its subcomponents, which come from the 2011 OECD progress report.

IV. Empirical Test Findings

The results of the empirical test are summarized in the following table.

The overall specification test shows that equation (1) is not a satisfactory specification for simultaneous estimation of the variables. The Wald Chi square is not sufficiently large enough at the usual levels of significance. In contrast, the equation (2) is not rejected by the Wald Chi square test at a low level of significance. The only difference between the two growth equations is that while equation (1) uses a composite index of the Paris Declaration, equation (2) adopts a disaggregated index for each of the five principles of the Paris Declaration. During the estimation of equation (2), the CPIA and the interactive term between aid and CPIA variables are dropped, possibly due to the high collinearity between CPIA and ICRG. For this reason, equation (1) was estimated again without the CPIA and its interactive terms. However, the modified specification (1) again failed to pass the overall specification test, as shown in Table 1.

<Table 1> Regression Results

Dependent variable: growth rate of per capita GDP	Hausman-Taylor analysis method		Expected sign of coefficient
Independent variables	Equation 1	Equation 2	Equation 2
Initial GDP per capita	0 (0.31)	-0.004 (0.77)	(-)
Investment/GDP	0.151 (1.73)*	0.46 (2.83)***	(+)
Human capital	-0.008 (0.17)	-0.408 (3.73)***	(+)
Export/GDP	0.029 (0.67)	0.313 (2.71)***	(+)
FDI/GDP	-0.025 (0.24)	-0.964 (4.64)***	(+)
Aid/GDP	-1.267 (1.77)*	-9.707 (4.47)***	(+/-)
$(Aid/GDP)^2$	0.01 (0.51)	-0.053 (2.25)**	(-)

<Table 1> Continued

Dependent variable: growth rate of per capita GDP	Hausman-Taylor analysis method		Expected sign of coefficient
Independent variables	**Equation 1**	**Equation 2**	**Equation 2**
ICRG	-0.87 (1.35)	-4.501 (2.07)**	(+)
ICRG*Aid	0.11 (1.24)	0.43 (1.95)*	(+)
Population growth	-0.909 (0.85)	-3.192 (1.07)	(+/-)
PD	-0.016 (0.58)		(+)
PD*Aid	0.006 (0.76)		(+)
PD-1		-0.036 (0.3)	(+)
PD-2		-0.602 (4.37)***	(+)
PD-3		0.453 (4.29)***	(+)
PD-4		-0.131 (1.18)	(+)
PD-5		0.095 (0.52)	(+)
Aid*PD-1		0.009 (0.95)	(+)
Aid*PD-2		0.115 (4.80)***	(+)
Aid*PD-3		-0.04 (4.28)***	(+)
Aid*PD-4		-0.017 (2.67)***	(+)
Aid*PD-5		0.018 (1.87)*	(+)
Constant	8.984 (1.41)	83.506 (3.41)***	
Number of observations	79	54	
Overall specification test	Wald $chi^2(12)=12.02$ Prob > $chi^2=0.4443$	Wald $chi^2(20)=122.80$ Prob > $chi^2=0.0000$	
Over-identification test	$Chi^2(7)=9.43$ Prob > $chi^2(7)=0.2231$	$Chi^2(11)=11.67$ Prob > $chi^2(11)=0.3888$	

Note: 1) Numbers in parentheses are z-value.
2) *, **, *** represent the level of significance at 10%, 5%, and 1%, respectively.

The estimation of equation (2) without the CPIA and its interactive term with the aid variable passed not only the Wald Chi square test for a simultaneous estimation, but also the over-identification test. For an instrumental variable estimation, this study uses aid and its interaction with institution (ICRG) and five disaggregated Paris Declaration indexes as instruments since these variables may have endogeneity problems with the dependent variable, i.e., growth of GDP per capita. In other words, while the growth rate of income may be explained by the aid and its interactive terms, they may also be influenced by the growth rate of income. The over-identification Chi square test cannot reject the null hypothesis that the excluded instruments are valid instruments, i.e., uncorrelated with the error term and correctly excluded from the estimated equation. Therefore, this study's designation of the aid and its interactive terms as instruments is entirely proper. The over-identification test also shows that this study's estimation is robust to heteroskedasticity in the errors.

The estimation result of equation (2) shows that the variations in the growth rate of GDP per capita are explained significantly by all the determinants that are traditionally mentioned in the growth literature, except the initial GDP per capita. Investment and export variables have positive effects on growth of GDP per capita. However, human capital and FDI variables have negative effects on growth in this data set. FDI is possibly in a substitutional relationship with aid.

The coefficient on the institution variable (ICRG) is significant but negative, contrary to our expectation. However, its interactive term with aid is positive, which means that aid alone has negative effects on growth, but when aid is given to countries with good institutions and effective government, aid has positive effects on growth of per capita income. In other words, aid effectiveness is conditional on the level of institutions and governance. This finding is consistent with World Bank (1998), Burnside and Dollar (2000), and Collier and Dollar (2002) studies.

The (Aid/GDP) and its square variables have a negative sign. Therefore, although aid does not appear to have positive effects on economic growth, aid does have a diminishing return, which is consistent with the earlier studies (Burnside and Dollar, 2000; Hansen and Tarp, 2000; Dalgaard and Hansen, 2001; Collier and Dollar, 2002). However, overall net effects of aid on economic growth should be assessed not on the basis of the sign of the (Aid/GDP) variable alone, but the marginal impact of aid on growth (Ga), which can be derived from equation (2) (on the basis of estimated significant coefficients only), as follows:

$$Ga = -9.707 + 2 * (-0.053)\,(Aid/GDP) + 0.43\,(ICRG) + 0.115\,(PD\text{-}2) + (-0.04)\,(PD\text{-}3) + (-0.017)\,(PD\text{-}4) + 0.018\,(PD\text{-}5) \quad (3)$$

Aid can affect growth not only independently, but also in interaction with other policy/institution variables. If we take the average value of the variables in equation (3) from <Appendix Table 2>, the marginal impact of aid on growth is negative. Therefore, aid has negative effects on growth of GDP per capita. This finding is congruent with Ovaska (2003), but different from Hansen and Tarp (2000 and 2001). This may imply that aid has not been allocated to the countries that are capable of using the aid effectively for economic growth, and/or aid has not been applied to the sectors or programs, so as to be used productively for growth of per capita income. Or it may mean that aid has simply substituted for domestic resources used before the aid came in, and therefore no net additional resources have been invested for growth of the recipient economy as a whole (i.e., aid fungibility). These interpretations are consistent with the findings of the earlier studies by Easterly (2003), Heller (2005), Rajan and Subramanian (2005), and Lee (2012a and b).

Among the disaggregated Paris Declaration Indicators, the coefficient of PD-2 (donors' aid aligned with recipient's development strategy and programs), which has a negative sign, and PD-3 (harmonization among donors), which has a positive sign, is statistically significant. PD-1 (setting up development strategy and programs by recipients), PD-4 (result-based aid management by donors and recipients), and PD-5 (mutual accountability between donors and recipients) have statistically insignificant coefficients.

However, when these PD indicators interact with aid, (Aid∗PD-2) and (Aid∗PD-5) have positive effects on growth of per capita income, and (Aid∗PD-3) and (Aid∗PD-4) have small but negative effects on growth of per capita income. (Aid∗PD-1) is statistically insignificant. This means that in promoting growth of per capita income, it is extremely important to have aid aligned with recipient country's development strategy and operational programs, making use of recipient's public finance management and procurement systems, and mutually accountable mechanisms by both recipients and donors. This finding is consistent with the OECD progress report (2011). It reports that only one item in PD-2 out of 12 monitoring indicators of the Paris Declaration has been achieved during 2005~2010 period; less clear and consistent progress has been attained in the rest of PD-2 and PD-3 indicators; and the least progress has been made in PD-4 and PD-5 indicators.

Also, this study shows that setting up development strategy and programs by recipients (PD-1) alone or establishing sound public finance management and procurement system (PD-2) alone is insufficient to make any positive effects on growth of income. However, when the recipient's development agenda and public sector management systems are supported by aid (i.e., PD-2∗Aid/GDP), they make positive effects on growth of per capita income. The same can be said on the mutual

accountability (PD-5∗Aid/GDP). Therefore, OECD's statement that the Paris Declaration principles are effective in promoting aid to make contributions to economic growth is only partially supported by the data set of this study.

V. Conclusion and Recommendations

Although aid has been conceived as one of the most powerful policy tools for growth and poverty reduction in developing countries, its effectiveness has been challenged and debated for a long time. However, ever since the Paris Declaration was adopted by some 180 representatives of developed and developing country governments and international development organizations in 2005, it has been touted by OECD as the most appropriate principles and practices to make aid more effective in developing countries. Although more than eight years have passed since the Paris Declaration was adopted, there has been no rigorous analysis to evaluate its empirical impact on development. This study attempts to fill this gap in the literature.

Using the data collected by the OECD/DCD working party from 78 developing countries over the period 2005~2010, this study has analyzed the role played by the Paris Declaration principles alone and in interaction with aid in promoting growth of per-capita GDP of the sampled countries. The analysis shows that the overall net impact of aid on economic growth of developing countries has been negative, but that aid effectiveness has been enhanced by sound institutions and some principles of the Paris Declaration. The five PD indicators alone had some mixed effects on economic growth. However, when they interact with aid, some of them enabled aid to have positive effects on economic growth. In particular, the alignment and, to some extent, the mutual accountability principles did play a significant and positive role in making aid more effective for economic growth of developing countries. Regarding the rest of the PD indicators, however, there is no positive evidence that they promote aid effects on economic growth in aid recipient countries.

These results contrast sharply with the Dalgaard and Hansen (2001) and Hansen and Tarp (2000 and 2001) studies, but are congruent to some extent with the findings of earlier studies (World Bank, 1998; Burnside and Dollar, 2000; Collier and Dollar, 2002) in the sense that aid effectiveness has been promoted by sound institutions and policies including some principles of the Paris Declaration.

The ineffectiveness of some principles of the Paris Declaration challenges the prominent role given to policies and institutions for economic growth in the literature (Acemoglu *et al*., 2005; North, 2005; Rodrik *et al*., 2004; Collier and

Dollar, 2002; Burnside and Dollar, 2000). Conceptually and theoretically speaking, it is persuasive to hypothesize that the Paris Declaration enhances aid effectiveness in promoting economic growth. Empirically, however, this study can confirm only partial evidence for this hypothesis. There may be several reasons for this discrepancy and shortcoming.

First, the six-year period covered in this study may be too short for the PD to make any visible impact on aid effectiveness. Second, progress made in implementing the Paris Declaration may have been too modest to make any significant and broad impact on aid effectiveness. Among the targets set for the 12 PD indicators, only one (alignment) was fully met, and all the other targets were attained only moderately (OECD, 2011). Third, the Paris Declaration itself may be deficient in some manner. As indicated in the literature review above, neither the Declaration nor its PD indicators include any principles or targets related to rational or optimal allocations of aid by recipient countries, sectors, or programs.

It is therefore recommended that to address the first possibility mentioned above, new empirical studies to evaluate the Paris Declaration's role in enhancing aid effectiveness be launched again after more time has elapsed. In the meantime, both aid donors and recipient countries should make stronger efforts to implement the principles and indicators of the Paris Declaration. Finally, partners of the Paris Declaration should expand its scope to include some policies or principles related to optimal aid allocations to ensure that aid are placed to the right countries, sectors, and programs that can use it effectively for economic growth and poverty reduction.

Recently, it appears that, both developed and developing countries, as well as international development organizations and NGOs, are arguably being too hasty in planning future international development cooperation. Rather than focusing on attaining or exceeding the targets of the Paris Declaration and then assessing their effectiveness on economic growth and development, the 2011 Busan Consensus forged a new global agreement for international development cooperation and aimed to improve effectiveness and coherence of all development policy tools simultaneously (such as resource mobilization, service delivery, foreign direct investment, trade, environmental protection, anti-climate changes, institutional changes, private sector development, recovery from economic downturns, food security, fuel price control, and future shocks prevention). The scope of the agenda goes much beyond effective aid management and seems much broader and more ambitious than what is warranted by the achievement record of the Paris Declaration to date. To promote development effectiveness, it is required to conceive policies broadly; however, a more focused action is recommended to make aid effective first.

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Appendix

<Appendix Table 1> Data Sources

Variable	Explanation	Source URL
Growth rate of real GDP per capita	Growth rate of GDP per capita in current US dollar deflated by US GDP deflator	http://data.worldbank.org/indicator/NY.GDP.MKTP.CD
Initial GDP per capita	GDP per capita in 2005	http://data.worldbank.org/indicator/NY.GDP.MKTP.CD
Investment/GDP	Gross capital formation (% of GDP)	http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS
Human capital	Secondary school enrollment rates	http://data.worldbank.org/indicator/SE.SEC.ENRR
Aid/GDP	Net ODA received (% of GNI)	http://data.worldbank.org/indicator/DT.ODA.ODAT.GN.ZS
Export/GDP	Exports of goods and services (% of GDP)	http://data.worldbank.org/indicator/NE.EXP.GNFS.ZS
FDI/GDP	Foreign direct investment, net inflows (% of GDP)	http://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS
Population growth	Population growth (annual %)	http://data.worldbank.org/indicator/SP.POP.GROW
CPIA	Sum of the four CPIA clusters (Range 4~16)	http://data.worldbank.org/indicator/IQ.CPA.STRC.XQ/countries
ICRG	The PRS Group, Inc. indicators of bureaucracy quality (Range 0~4), corruption (0~6), and law and order (0~6)	http://www.prsgroup.com/prsgroup_shoppingcart/p-75-icrg-historical-data.aspx
PD-1	Ownership	http://www.oecd.org/dataoecd/25/30/48742718.pdf
PD-2	Alignment	http://www.oecd.org/dataoecd/25/30/48742718.pdf
PD-3	Harmonization	http://www.oecd.org/dataoecd/25/30/48742718.pdf
PD-4	Result-oriented framework	http://www.oecd.org/dataoecd/25/30/48742718.pdf
PD-5	Mutual accountability	http://www.oecd.org/dataoecd/25/30/48742718.pdf
aPDI (Paris Declaration Indicator)	Average of PD-1, PD-2, PD-3, PD-4, PD-5	http://www.oecd.org/dataoecd/25/30/48742718.pdf

<Appendix Table 2> Sample Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
GDP PC growth	229	3.59896	3.265002	-6.63703	20.24291
Initial GDP PC	231	1392.111	1413.518	109.7554	6321.993
Investment/GDP	192	23.90247	7.446886	8.91287	61.46868
Human capital	163	56.44681	26.67882	9.82571	107.4882
Export/GDP	206	33.42307	15.90339	9.75318	87.06688
FDI/GDP	228	5.208526	6.514902	-2.49885	45.92072
Aid/GDP	226	11.10846	17.38031	-0.17302	176.83
$(Aid/GDP)^2$	226	424.1364	2358.424	0.029936	31268.87
ICRG	150	6.531944	1.612728	2	10
Aid*ICRG	149	53.33513	96.74887	-1.38417	906.254
Population growth	231	1.837291	1.004582	-0.73279	4.815569
aPDI (PD indicators)	210	56.14684	11.93232	16.06667	95
Aid*PD	206	646.2158	793.6187	-11.0993	6754.908
PD-1	167	70	7.838736	50	90
PD-2	203	52.25474	15.01455	6.2	80.8
PD-3	174	38.44109	12.09355	10	95
PD-4	160	54.65625	28.27405	0	100
PD-5	169	67.75148	6.612381	50	80
Aid*PD-1	166	872.7473	1166.929	-10.3812	10609.8
Aid*PD-2	200	572.6533	589.8842	-11.7654	4067.091
Aid*PD-3	170	455.2482	741.5616	-7.39664	6365.882
Aid*PD-4	147	630.5077	676.1905	-13.8417	3491.996
Aid*PD-5	168	846.703	1248.471	-12.1115	12378.1