Improving China’s Aid Effectiveness Through Strengthening Strategic Management of Developmental Public Private Partnerships

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IMPROVING CHINA’S AID EFFECTIVENESS THROUGH STRENGTHENING STRATEGIC MANAGEMENT OF DEVELOPMENTAL PUBLIC PRIVATE PARTNERSHIPS

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A DELTA Doctoral Thesis Submitted to the Faculty of

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ABSTRACT

A prominent feature of China’s evolving aid system has been the involvement of Chinese firms in implementing diversified development cooperation projects. Chinese aid managers face challenges in managing the burgeoning partnerships effectively, particularly in health aid, where the public-private partnerships (PPPs) have brought both opportunities and risks, requiring much more robust decision making and implementation support systems to secure the effectiveness of the aid. An in-depth analysis of the situation indicated that the challenges were rooted in the multiplicity of China’s aid goals and its changing aid architecture. Meanwhile, the human mind and cognitive behavior also interact with the context and influence the quality of PPP decisions. The DELTA project aimed to ameliorate this situation by adapting a multi-criteria decision-analysis tool for improving the quality of aid decisions by structurally assessing various aspects of PPP and systematically organizing PPP decision-making processes to reduce human error. The tool was further reinforced by a set of policy and technical frameworks developed to regulate the planning, management, measurement, and reporting of aid activities under a PPP model, including health PPPs. On reflection, the DELTA project provided new knowledge about China’s global aid by shedding light on serious problems in PPP-related development cooperation, and put forward concrete management actions for China’s aid agencies to overcome these challenges. By engaging in global partnerships and dialogues, the project further facilitated mutual learning and paved way for further improvement in the effectiveness of PPP-related aid.
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PART I. INTRODUCTION

1.1 Background

1.1.1 China’s Expanding Development Cooperation

China’s net foreign aid has been increasing steadily for the past decade, with an average annual growth rate of 18% in 2001–2013 (Kitano & Harada, 2014). Including export buyer’s credit, China’s total disbursement for development cooperation reached $12 billion US in 2015 (Kitano, 2017). Meanwhile, China’s National Planning Agency announced further increases in China’s global aid (National Development and Reform Commission [NDRC], 2015). The new commitments made China the largest developing country to provide aid outside of the Development Assistance Committee (DAC; J. Y. Zhang, 2016).

Figure 1. Trend and Composition of China’s Foreign Aid Flow, Source: JICA (2014)
In the changing landscape of China’s global development aid, cooperative mechanisms are still evolving to meet the diverse needs of intensified bilateral, trilateral, and multilateral cooperation. New development banks, the Asia Infrastructure Investment Bank, and the Belt and Road Initiative are among the most prominent examples of such mechanisms supporting China’s increasing engagement in global development. Other initiatives were designed with more specific mandates; for example, the South-South Cooperation Assistance Funds, for which $3 billion US was committed to help developing countries implement their post-2015 development agendas (Ma, 2015). Along with these multibillion-dollar programs are the interactions of numerous actors, institutions, and resources, which constitute a labyrinth of power with the potential to reshape the global development landscape in the foreseeable future.

1.1.2 Organization of China’s Global Development Cooperation

Like those of the Organization for Economic Cooperation and Development (OECD) countries, China’s aid structure involves a multitude of actors dominated by key ministries and public institutions (Table 1). But what distinguishes the Chinese aid model from Western donors is the role of the Ministry of Commerce (MOFCOM). Through its Department of Foreign Aid, MOFCOM acts as the leading government agency, with comprehensive responsibilities for planning, financing, and monitoring bilateral aid and increasing multilateral aid. Other government entities engage in development cooperation in a more functional way, usually as financiers, implementers, or cooperating partners.*

In terms of funding type, grants, concessional loans, and free-interest loans used to be

* As this thesis was being finalized, the government of China approved a plan to establish a new international development cooperation agency to coordinate its foreign aid program, on March 12 2018:
the main aid instruments of China’s ODA-like aid program.† Since the aid reform in the mid-1990s, however, China has taken an increasingly integrated approach to its foreign aid, trade, and investment (Lin & Wang, 2017). As a result, non-concessional loans and financial tools that largely fall under OECD’s “other official flow” (OOF) classification‡ have become important instruments in the country’s official development finance. Along with the financial flow are an array of financial-institute partners, such as China’s Development Bank, EXIM Bank, and even commercial banks.

Table 1. Actors and Instruments in China’s Development Finance

<table>
<thead>
<tr>
<th></th>
<th>ODA-like</th>
<th>OOF-like</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financier</td>
<td>MOF</td>
<td>Policy banks (EXIM, CDB), commercial banks</td>
</tr>
<tr>
<td>Advisory Agency</td>
<td>MOFA and embassies</td>
<td>MOFA and embassies</td>
</tr>
<tr>
<td>Executing Agency</td>
<td>MOFCOM, NDRC (climate change)</td>
<td>Funds and programs</td>
</tr>
<tr>
<td>Implementing Agency</td>
<td>Sectoral agencies (health, agriculture, etc.)</td>
<td>Sectoral agencies, private-sector partners</td>
</tr>
<tr>
<td>Cooperating Partner</td>
<td>Technical institutes, academia, NGO</td>
<td>Technical institutes, academia, NGOs, private-sector partners</td>
</tr>
<tr>
<td>Financial Instrument</td>
<td>Grant, concessional loan, interest-free loan</td>
<td>Non-concessional loans, various lines of credit, joint ventures, official investment</td>
</tr>
</tbody>
</table>

† The OECD defines official development assistance (ODA) as government aid designed to promote the economic development and welfare of developing countries. Aid includes grants, "soft" loans (where the grant element is at least 25% of the total) and the provision of technical assistance. China, however, does not use the same definition, so the term cannot be used interchangeably for China’s development finance.

‡ OECD’s definition of other official flows (OOF): Transactions by the official sector with countries on the List of Aid Recipients which do not meet the conditions for eligibility as official development assistance or official aid, either because they are not primarily aimed at development, or because they have a grant element of less than 25%.
1.1.3 Enterprises in China’s Overseas Development Cooperation

Relative to their public counterparts, the active involvement of Chinese companies in overseas development cooperation is a phenomenon just of recent years, and state-owned enterprises (SOEs) have taken the lead in this new trend. Although it is debatable whether the reforms since the 1980s have succeeded in transforming SOEs from public entities into market actors, China’s globalization strategy has set the pathway for leading Chinese firms to compete as global players, SOEs, and private enterprises alike (H. Y. Zhang, 2013). Supported by low-cost loans, engineering contracts, diplomatic support, export-tax exemptions, interest-rate rebates, and other policy and financial instruments as described in the previous section, Chinese companies are extensively involved in many of China’s development cooperation projects, most visibly in infrastructure and construction (Gu, 2015).

1.1.4 Private Partnership in China’s Global Health Assistance

In the five-decade-long history of China’s foreign aid, oversea health assistance has gained the country an international reputation and even friendships (Li, 2011). Among the multiple forms of health aid China provides, its legacy of sending medical teams to developing countries has remained essentially unchanged since the 1960s. The task is resourced and organized by health authorities at central and provincial levels, with minimal involvement of not-state actors.§

Other Chinese health aid projects have greater or lesser private components. For example, by 2009 China had built more than a hundred hospitals and clinics worldwide under the commission of China Aid, including 54 in Africa (Li, 2011). Many hospitals also received

§ The staff of medical teams were selected from public hospitals and organized by provincial health department.
donations of medical equipment and medicine from China. Chinese construction firms, medical
device manufactures, and pharmaceutical companies served as contractors, suppliers, and
donors in these projects, even while constantly seeking opportunities in which their business
strength and commercial interests intersected with aid priorities. Their entrepreneurship has
also been inspired by China’s overseas health aid actions, markedly its quick and decisive
response to the Ebola outbreak and Beijing’s growing commitment to global health cooperation
as part of its global aid policy outreach."

Under the South-South Cooperation framework, the role of the private sector is no longer
limited to service providers. Chinese enterprises are encouraged to share their development
solutions and technologies with other developing countries and are aided in this by China’s
development finance support. Some newly identified areas for China’s global health
collaboration include innovations in the diagnosis, prevention, and control of diseases, epidemic
reporting and information management, medical-product supply-and-distribution systems,
emergency health services, and mobile health innovations (Ning, 2017). It is not easy to predict
the future scale and impact of this collaboration. Nevertheless, the trend is clear that in the new
era of China’s global health cooperation, Chinese enterprises will vigorously pursue
collaboration with development aid partners in bringing Chinese health solutions to the world.

1.2 The Problem

1.2.1 Challenges in Partnering with the Private Sector in Development Cooperation

The shifting role of the private sector in China’s overseas development cooperation will
inevitably pose challenges to the existing aid paradigm in China. First, the legal and regulatory

** As indicated in the outcome documents of six roundtables and two ministerial forums on the China-
Africa Health Cooperation (http://www.focac.org/eng/)
frameworks, designed for a state-centered aid superstructure, have little power to regulate companies’ overseas behaviors. Unlike many DAC countries, China does not yet have an overarching foreign-aid law. The 2014 trial decree on the administration of foreign aid was the closest substitute—albeit with only limited administrative power, as a ministerial order issued by MOFCOM (2014). Under the general principles outlined in this document, specific policies were developed to address various aspects of aid work. However, none of these has provided a clear regulatory framework on private activities in overseas aid, nor were they able to offer policy guidance on issues beyond the mandates of the ministry. This absence of regulation has created a legal vacuum that weakens the state’s ability to oversee and guide private activities in aid.††

Second, the relationship between aid agencies and private partners has changed from top-down, policy-maker-implementer types to more horizontal, collaborative partnerships, but this change is not yet been reflected in the aid decision-making processes. In practice, government entities remain dominant in aid allocation, planning, and quality assurance. Private partners are largely excluded from policy decisions, often considered to be applicants for aid resources, considering their other roles as solution providers, project initiators, and financiers. This distorted relationship affects the overall effectiveness of aid decisions and has a negative impact on the accountability and sustainability of public-private collaboration.

Third, development cooperation involving PPPs is multi-purposed by nature. Given the volume and impact of such collaboration, a top priority of aid administration is to ensure that political, diplomatic, and developmental considerations are not overshadowed by commercial interests. In an aid system that lacks a strong regulatory framework and in which decision-making and

†† The new aid agency to be established as announced by the government of China on March 12, 2018 is a positive signal for structural change toward strengthening the regulatory framework of aid.
accountability structures are obscure, the responsibility for getting things right has largely been borne by aid agencies and their staffs. The challenges they face are manifold at both the institutional and individual levels. Information asymmetry, limited manpower and knowledge, and lack of appropriate managerial skills are all potential pitfalls that could lead to failure in complicated aid programs such as public-private collaborations.

1.2.2 Existing Efforts and Remaining Gap

In light of these gaps, Chinese aid agencies are making efforts to address the challenges by improving institutional and managerial capacities in aid-program management. At the institutional level, the problem is generally described as a lack of capacity for managing complicated partnerships with the private sector, which usually implies personnel shortage and inadequate technical knowledge and managerial skills. Common solutions include the following approaches: (i) recruiting more staff members with professional experience working with the private sector, (ii) providing PPP-related trainings to aid managers, (iii) hiring external consultants or outsourcing to firms to provide technical assistance for PPP transactions, and (iv) translation and adaptation of international experience and practices in PPP. By combining internal capacity building with external backstopping, these approaches may ameliorate the situation somewhat. But very few people have suggested that the problem itself may be too narrowly defined, and that the prescription for capacity building follows a circular logic, confining the focus to inadequacy in technical and organizational capacity and thus restricting the ability to understand and address the issue from other perspectives.

1.2.3 An Alternative Interpretation - Justification for the DELTA Project

As discussed in the earlier analysis, a core issue in the management of PPP for overseas development cooperation is to strike a balance between the diverse interests of
multiple actors. This issue is not properly addressed in the capacity-building model, whose underlying assumption is that simply with adequate manpower, knowledge, and skills, aid managers will be able to make sound decisions. This assumption is only partially valid, as it overlooks the contextual and cognitive barriers that aid managers may have to overcome. An alternative assumption is that the problem is also rooted in the context, in which a certain pattern of decision-making is shaped in a way that leads to suboptimal results. To help Chinese aid managers make more effective decisions about PPP-related development cooperation, we need to anchor the issue to the context in which aid decisions are made, disentangle the process to find out where the problem occurs, and introduce targeted intervention measures for correcting the errors.

1.3 Project Goal

Based on above analysis, the goal of the DELTA Project is to improve China’s aid effectiveness by strengthening the strategic management of developmental public-private partnerships. To achieve this goal, the project has two specific objectives:

a) Bringing a degree of structure, analysis, and openness to the decision-making process in the use of PPP, and

b) Improving the operational efficiency of PPP arrangements by introducing and adapting international experience.

Through an in-depth analysis of the issues and challenges in aid decision-making, the project aims to help Chinese aid agencies improve the discretion and consistency in their use of PPPs and make their decision processes more structural, transparent, and participatory. The analytical approach will be aided by efforts to enhance the operational efficiency of PPP arrangements, which aim to minimize potential losses and misallocation of resources, making PPP-related aid provision more predictable and efficient. For an emerging development partner
like China, learning from international experience and applying internationally recognized methods could create opportunities for better communication and coordination with stakeholders. It is believed that by combining the analytical approach with practical capacity-building interventions, the DELTA Project could improve the effectiveness of China’s development cooperation with private-sector partners.

1.4 Structure of the Thesis

This DELTA Doctoral Thesis consists of five parts and begins with an abstract summarizing the key discoveries of the project. The first part is an introduction to the issues surrounding developmental PPP, the background of China’s development cooperation, and a justification for undertaking the project. The second part, Analytical Platform, reviews the relevant literature on experience and lessons in the use of PPP in global development aid and health aid, analyzes factors in China’s PPP-related decisions, and provides conceptual and empirical foundations for the project. The review is followed by an intervention strategy that makes up the action part of the DELTA Project. This includes the theory of change that logically underpins the project, and the proposed interventions and justifications grounded in evidence. The third part, Result Statement, presents a narrative discussion of the project’s implementation in terms of the degree to which the stated goals and objectives were achieved. Reflections on the analytical framework and theory of change are also made in this part, together with a discussion of how the project will contribute to broader learning about improving the effectiveness of developmental PPPs, with a specific example of a health PPP. The final part is a conclusion that broadly reviews the project, its key findings and main analytical takeaways, and issues to be considered beyond this work.
2.1 Existing Knowledge

To help China improve the effectiveness of its PPP-related development cooperation, it is important to understand the design and development of PPP as a public financing tool, its definition, intervention logic, advantages, and shortfalls in application, including in the health sector. The first part of the literature review hence summarizes the major findings in on these topics. But given the complexity of both PPP and global development aid, it is necessary to dive deeper and look at how the incentives of PPP fit into in the global development context and interact with factors that drive aid behaviors as well as decisions. The second part of the literature review does this by drawing a picture of the application of PPP in the reality of global development aid.

2.1.1 PPP as a Public Financing Tool

Definition and Development of PPPs

There are many types and definitions of PPPs. Generally speaking, the term “public-private partnerships” is used in two distinct ways: “infrastructure PPP” (sometimes called “contracting PPP”), and “developmental PPP” (Ingram, Johnson, & Moser, 2016). The former explicitly refers to a structural arrangement by which the government contracts a private company to design, build, or operate public infrastructure, such as a water plant or a toll road. The private entity is typically remunerated either with revenue generated by the infrastructure for an extended period of time, or with a simple payment by the government. The roles and obligations of the public and private entities are usually legally defined in a contract, under key principles such as risk-sharing and quality assurance.
“Developmental PPP” is much broader and less structurally defined. It usually involves public and private entities working together in pursuit of public goals that serve the interests of both public and private partners (Engel, Fischer, & Galetovic, 2014). In developmental PPPs, private entities also include non-governmental organizations (NGOs). ‡‡

From a historical perspective, developmental PPPs could also be viewed as a derivative of the conventional PPPs that originated in 1970s in the United Kingdom, and were marked by the privatization of sectors formerly dominated by public provision for financial, efficiency, and ideological considerations. The trend spread to both developed and developing countries in the following decades, though it was temporarily slowed by the 2003 economic crisis. Engel et al. (2014) documented a 28.3% growth rate in PPP investment in lower- and middle-income countries between 1990 and 1997, and a new wave of growth beginning in 2003 that was barely affected by the 2009 crisis. However, they noted that low-income countries did not attract much private sector investment. Sub-Saharan Africa lagged behind other regions and had the smallest share of infrastructure investment from the private sector.

PPP Intervention Logic, Benefits, and Shortfalls

In a systematic literature review of public-private partnership, the Policy and Operation Evaluation Department (IOB) of the Dutch Ministry of Foreign Affairs (2013) summarized the rationales for implementing PPPs along four dimensions:

- **Financial:** Funding from the private sector can help fill the immense gap between the limited public resources and the rapidly growing demands for infrastructure and other

‡‡ The definition of PPP partially overlaps with that of “tied aid,” a term used by the OECD to describe official grants or loans that limit procurement to companies in the donor country or in a small group of countries (http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/untied-aid.htm). The definition of PPP here is broader, covering more strategic collaboration with private sector partners for development purposes.
public services. Risk diversification is a key motive for the government to implement PPP, to “encourage investment that would otherwise not have been carried out because of high product/market risk.”

- **Developmental**: Governments rely on PPP projects to distribute benefits, realize development goals, or implement international standards.

- **Efficiency**: PPP is used to correct some government failure (e.g., inefficient pricing, capture and corruption, or poor operation and maintenance) or market failure (e.g., the private sector does not invest enough in less profitable but publicly beneficial projects).

- **Ideological or political**: PPPs gained support in the 1990s because of the popularity of liberalization and reduced state intervention.

Advocates of PPPs have offered many arguments that PPPs can bring numerous benefits. When managed properly, PPPs could relieve budget constraints and release public funds. The life-cycle approach (e.g., bundling construction, operations and transfer) of PPP may also help minimize costs and lead to efficiency gains. In most cases, PPPs mimic competitive markets through open bidding. And the pricing strategy under private financing is considered more financially sustainable, which help in filtering white-elephant projects. Private-sector-initiated PPP projects also have an income distributional function that could help governments balance political pressures for low fees (Engel et al., 2014).

On the other hand, some shortcomings of PPPs are also well documented. Engel et al. (2014) pointed out some major problems of PPP projects: The potentially high costs associated with the preparation and management of PPP arrangements can limit their use to large projects. PPP projects are also subject to opportunistic renegotiation that can lead to prolonged timelines and unexpected outcomes. And when they are financed via user fees, PPP projects can raise concerns about intergenerational equity.
In light of these benefits and pitfalls, multiple studies have been conducted using cross-sectoral analysis and country cases to analyze critical factors in the success or failure of PPP projects (IOB, 2013). The factors that matter the most to success include sound regulatory frameworks and dispute-resolution mechanisms, legitimate recovery of cost, and profits proportional to the risk undertaken. Strong government involvement and standard setting were considered important, as were a shared vision and a trustworthy relationship with private partners. Other success factors include complementary strengths in the public and private partners, commitment, and converging working cultures. In addition, a country’s past experience with PPP, its macroeconomic environment and legal context, the technical and managerial capacity of the partners, and timing and political commitment were all found to affect the success or failure of PPPs.

**Development of Health PPPs**

Although PPPs were found to be most successful in the utility-infrastructure sector, in the past two decades similar arrangements have increasingly been used for social infrastructure, such as schools, hospitals, and health services. Again, PFI in the UK has become well known for supporting the country’s National Health Services (NHS)—the world’s largest single-payer health system—by constructing more than one hundred buildings in 12 years (Barlow, Roehrich, & Wright, 2013). And, though not without criticism and some well-publicized failures, broader partnerships with the private sector have been carried out in Europe, North America, and Africa to underwrite not only the cost of constructing health care facilities, but also, increasingly, that of operating and delivering health services (PWC, 2010).

Starting in the mid-1990s, PPPs have been developed as an instrument of global health aid, with a focus on the development and delivery of medicines needed by poor people in
developing countries (Ruckert & Labonté, 2014). The Global Health Partnerships (GHPs) brought together pharmaceuticals companies, academics, non-profit and philanthropic organizations, governments, and inter-governmental agencies. The 2000s witnessed significant growth in these partnerships, both in numbers and in diversity, which was facilitated by the establishment of a series of global coordinating and financing mechanisms, such as the Global Alliance for Vaccines and Immunization (GAVI) and the Vaccine Fund (VF), Roll Back Malaria (RBM), the Stop TB Partnership, and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Ruckert & Labonté, 2014).

Categorized by financing and provision of health care services, health PPPs largely fall into two groups (Figure 2): those primarily financed by government to leverage the operational efficiency of the private sector to improve the access, quality, and availability of services; and joint public and private efforts in discovering and developing essential medicines (Berman, 2017; Ruckert & Labonté, 2014).
2.1.2 PPPs as an Instrument in Global Development Aid

PPPs is a prominent component of the strategic agendas of development organizations. For example, the strategy the World Bank Group adopted in 2013 expressed its firm intention to “increasingly promote public-private partnerships” (IEG, 2015). In practice, PPPs have been widely used to assist developing countries in overcoming the challenges of inadequate infrastructure. The World Bank’s Independent Evaluation Group (2015) reported that from 2002 to 2012, the World Bank Group’s support of PPPs increased by about three-fold, and PPPs were used in more than 134 countries and contributed 15–20% of the total infrastructure investment in those countries. The IEG report also found that PPPs are largely successful in reaching their development goals. Improved access was generally achieved, and where data are available, financial, efficiency, and quality improvements were also confirmed in the majority of cases.

Supported by the positive evidence on the use of PPPs, the international development community seems to be reaching a policy consensus, with the concept of “blended finance”

§§ Adapted from Berman (2017) GHP 245 Session 14 Class Slides.
introduced in 2015 by the OECD as the “strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging markets” (OECD, 2015). The Addis Ababa Action Agenda (AAAA) of the 3rd International Conference on Financing for Development (2015) further recognized that “both public and private investment have key roles in infrastructure financing . . . including through public-private partnerships.” In the absence of a widely recognized definition of PPPs, donors tend to consider the use of ODA to leverage private-sector resources to be a smarter way of spending limited aid dollars, basing their arguments on domestic experience in private participation, diminishing official development aid, and the considerable financial gap in implementing the 2030 agenda for sustainable development.

Despite private sector’s growing participation in development assistance, other observers raised concerns about whether PPP could be an effective instrument in delivering development results. In a review of the recent literature on the effectiveness of PPPs, Jomo et al. (2016) noted criticism based on the increasing number of PPP failures and the varied impact of PPPs across sectors. Research findings have also indicated that PPPs are generally better suited to economic infrastructure and less likely to deliver efficiency gains in the social sector. Other critics have questioned the “hidden agenda” of using blended finance to pursue donor countries’ own international trade and investment-promotion goals.

**Incentives of PPP in the Context of Aid Effectiveness**

Recognizing both opportunities and challenges in the private sector’s contribution to development, researchers and professionals have further analyzed the role of PPP in the context of aid effectiveness. An OECD workshop in 2010 noted that for the aid effectiveness agenda, it is important to understand what incentives drive private sector entities to engage in development work and how these incentives shape their decisions and behaviors (Davies,
The report further noted that multiple factors can motivate the private sector to engage in development processes. These incentives largely fall into two categories:

- **Development as business opportunities.** Addressing global development challenges is increasingly presented as a multi-trillion dollar business opportunity, as manifested in a joint donor-business coalition paper: “The leading companies of the future will be those that do business in a way that addresses the major development challenges” (Ashley, 2010). A typical business incentive would be the chance to engage in developing countries and provide services for which there is growth potential. Corporate social responsibility and staff morale were also parts of the incentive mosaic for private companies, albeit less important ones (OECD, 2015).

- **Risk sharing.** Under a PPP arrangement, government transfers part of its public responsibility to private partners. The division of responsibility often moves together with shifts of risks, the risks being managed by the party best able to handle them. From the private sector’s perspective, such a risk-sharing system mitigates the dangers and negative externalities associated with their investments in new and emerging markets.

Although little in-depth comparative analysis is available on the evolving relationship between ODA and private participation, evidence shows that in the past decade, most bilateral and multilateral donors and development finance institutions have increased both the volume and the variety of their partnerships with the private sector, driven by three objectives: (i) catalyzing domestic and foreign private investment and innovation, (ii) promoting better corporate governance, responsibility, and accountability, and (iii) including private sector representation in development policy-making (OECD, 2015).

In a qualitative study of the role of the private sector in aid and development, Davies (2011)
argued that the incentives of donors have to at least partially converge with those of their private partners to be able to explain the positive development results produced by some PPPs. Nevertheless, it was acknowledged that when the profit incentives of the private sector come into conflict with development objectives, they may create challenges for the aid effectiveness agenda and have unexpected consequences; for example, poor labor standards, the exclusion of poor populations, environmental degradation, or tax avoidance.

**PPP and Determinants of Global Aid**

The incentives for using PPP for development aid are also shaped and influenced by donors’ motivations for aid, which are the force that initiates, guides, and maintains goal-oriented aid behaviors. The literature on the determinants of foreign aid allocation dates back to the late 1960s. Amusa, Monkam, and Viegiz (2016) grouped the earlier studies into three models: a recipient-need model, a donor-interest model, and a hybrid model that combines the first two. The argument about the complexity of the determinants of aid flow was well documented in a series of studies in the 1990s. Lumsdaine (1997) emphasized the “moral vision” that underlies foreign aid, arguing that donors were motivated less by political and economic interests than by humanitarian needs from 1949 to 1989, but other authors rejected an altruistic vision of donor motivations. Schraeder, Hook, and Taylor (1998), for example, clarified the foreign aid puzzle by explaining three general bodies of international relations theory that led to the creation of competing paradigms about what motivated donors in giving foreign aid:

- The **realist paradigm** assumes that aid policies are driven primarily by the strategic interests of nation-states, for which security and self-preservation are the main objectives. As a result, foreign aid is only minimally related to economic development and the humanitarian needs of the recipient countries.
In contrast to the classical realist view, neorealist scholars underscore the importance of the recipients’ economic potential in shaping global balances. Therefore, an economic dimension is added to the equation of national security, in addition to military strength and alliances, and therefore serves as one of the factors driving foreign aid priorities.

- The idealist paradigm and its neo-idealist offshoot, on the contrary, assert the overriding importance of humanitarian needs as the cornerstone of foreign aid programs. They believe in the potential utility of foreign aid for reducing poverty and promoting global economic development.

- Another more ideological paradigm, the Marxist or neo-Marxist model, argues that foreign aid is an extension of economic exploitation that preserves or widens economic disparities between wealthy states and poor countries. In the extreme case, neo-Marxists argue that foreign aid should be abolished in its current form and should instead serve as a way to redistribute economic resources in the pursuit of global economic equality.

Through a cross-sectional study of foreign aid flows in the final decade of the Cold War, Schraeder, Hook, and Taylor (1998) explicitly rejected the rhetorical statements of the policymakers of donor countries, that foreign aid is an altruistic tool of foreign policy. They found that ideology and strategic importance, including growing economic interests and other non-humanitarian needs, served as important determinants of the aid policies of major donors.

Alesina and Dollar (2000) echoed this with considerable evidence that the direction of foreign aid is dictated as much by political and strategic considerations as by the economic needs and policy performance of the recipients. In addition, colonial past and political alliances are major determinants of foreign aid:
“An inefficient, economically closed, mismanaged non-democratic former colony politically friendly to its former colonizer, receives more foreign aid than another country with similar level of poverty, a superior policy stance, but without a past as a colony.”

In a paper on the interactions between aid, policies, and growth, Burnside and Dollar (2000) further suggested that donors’ strategic interests may be more important than the quality of the policies of receiving countries as an explanation of aid flows. As presented by these and other researchers into the relationship between aid and growth, there is some general agreement on what incentivizes donors in providing aid, including poverty of the recipients, strategic interest, colonial history, trade, and political institutions of the recipients—although the definition and measurement of “strategic interest” is largely fragmented.

These authors also found significant differences between donors. Nordic countries tended to respond more to income levels, good institutions, and openness; France gave preference to its former colonies and political allies; the US’s pattern of aid was heavily influenced by politico-economic considerations; and Japan’s foreign aid policy was consistently motivated by economic interests, with the particular aim of enhancing exports through concessional aid.

Researchers also found that in comparison with foreign aid flows, foreign direct investments (FDI) were more sensitive to economic incentives. FDIs responded more to economic openness, such as improvements in policy management, trade liberalization, and better protection of property rights.

In a comparative case study of the aid allocation of Denmark, Norway, and Sweden, Forsudd (2009) examined the motives of these three highly similar donors. Applying a motive-
analysis method, Forsudd used two theoretical lenses of international relations: *structural realism* and *social constructivism*. Although the validity of his findings may be weakened by the limits of the materials used in the study—speeches and articles published by the governments themselves—the article offered a useful framework for analyzing major groups of motives and motive-indicators established to determine the relevance of motives in aid allocation.

**Motivations behind China’s Foreign Aid**

Debates on China’s foreign-aid motivations are mixed. Naím (2007) coined the term “rogue aid” to describe Chinese development aid to Africa (Woods, 2008). Ever since, China has been labeled by some as an irresponsible emerging power motivated by self-interest and the new colonialist hunger for natural resources, and indifferent to the long-term welfare of its recipient countries, therefore representing a threat to healthy and sustainable development (“The New Colonialists,” 2008). More generally, Western media, scholars, and traditional donors have expressed concerns that political stability, good governance, and accountability in recipient nations are threatened because China supports non-democratic regimes and is not transparent in its practices (Samy, 2010). Others take a more mixed view, seeing Chinese aid as an alternative approach to development and increased potential for meaningful South-South cooperation (Lengauer, 2011).

Some recent empirical studies have confronted the above claims. Dreher and Fuchs (Dreher & Fuchs, 2011), for example, examined several databases covering 1956–2006 to estimate the determinants of China's allocation of aid resources. They did empirical tests on three categories of motives: development needs of recipient country, quality of policies and institutions, and donor’s commercial or political self-interest. They found that Chinese aid allocation showed different patterns in different phases. However, as compared to DAC
members and other emerging donors, China’s aid allocation decisions were not inferior in terms of humanitarian needs or policy and institutional quality. Nor did China put greater emphasis on commercial ties or on countries with more abundant natural resources.

In a study comparing US and Chinese aid to sub-Saharan Africa, Amusa, Monkam, and Viegi (2016) confirmed the significance of both recipient needs and donor interests in both countries’ aid allocation. And for both countries, recipient governance was a significant determinant of aid allocation. Empirical results have further pointed to the acceptance of a strategic resource motive among the determinants of Chinese aid allocation.

2.1.3 Decision-Making in Development Aid

Regardless how diverse a country’s motivations for foreign aid are, these motivations are eventually embodied in the objectives of aid programs and operationalized by the implementation arms of aid agencies, where decision-making is the product of an interaction between mind and context. Understanding China’s aid decisions on PPP therefore requires not only examining the broad context in which aid work takes place, but also assessing the cognitive and psychological environments that individual decision-makers face. As the 2015 World Development Report pointed out, development professionals are often subject to biases, mental shortcuts, and cultural and social influence. Like all human beings, development professionals think automatically rather than deliberately, and act and think socially and with mental models (WBG, 2015). Empirical research has further found that the complexity of decisions can affect the quality of the choices made by development professionals. As the number of options increases, people’s ability to evaluate them all accurately declines (WBG, 2015). Because their decisions often have large effects on many people’s lives, it is important for development organizations to be aware of potential decision traps that aid professionals can
fall into, and put mechanisms in place to check and correct those biases and influences.

Regular capacity-development initiatives, however, often fail to address this issue. Datta and Mullainathan (2012) condensed some key insights of behavioral literature using a simple framework about the constraints under which people make decisions: although physical resources such as money, staff, and time are often obviously limited, we do not always realize that mental resources are also limited. Intervention design—for instance, capacity building aimed at expanding the knowledge base for decision making—may build on the mistaken but unconscious assumption that people have unbounded cognitive capacity, while ignoring the scarcity of attention and understanding and the use of potentially flawed mental models that could affect the quality of decisions. The policy-making process therefore might benefit from better diagnosis of behavioral drivers, and development organizations could be more effective if they applied behavioral insights into the design of their decision-making models.

2.1.4 Unpacking PPP through a Multi-disciplinary Approach

To help China’s development-aid managers make better decisions in selecting and managing aid models involving PPPs, the DELTA Project will carry out analysis and interventions that draw on the theories and the evidence and findings of the following disciplines.

- *International relations and development studies*. Theories and evidence about international relations are used to explain the context in which both aid providers and their implementation partners make aid decisions, and the motivations and incentives behind their aid provision, as these factors play an important role in the effective design and implementation of PPP aid modalities.

- *Public health*. The DELTA project will focus on health as a specific sector of
development cooperation. It will use knowledge about how health care is financed and delivered in aid-recipient countries, and about how the private sector as a development actor could play a role in strengthening the health system without creating extra burdens and competing with other priorities.

• **Behavioral study.** Because the outcomes of development aid rely on people to choose and decide in certain ways, the DELTA Project uses behavioral economics to explain why aid managers choose and behave as they do. By approaching the problem from a behavioral economics lens, the project hopes to better diagnose the challenges, and thus allow better-designed solutions.

• **Decision science.** The project also draws on the essence of decision-making research, particularly multi-criteria decision analysis (MCDA) tools and techniques, and combines this with practical experience to design interventions that could aid PPP-related decision making in China’s overseas development cooperation.

The intersection of the theories and findings of these disciplines will deepen our understanding of the multi-faceted factors in the decision-making process for PPP-related aid, which will inspire and guide the design of the solution—an interventions strategy of the DELTA Project for redesigning thinking models for better development results.
2.2 DELTA Approach & Method

2.2.1 Theory of Change

Rationales

As described in Part II of the thesis, China’s global development finance is expanding in both volume and scale, with the private sector playing an increasingly important role in the process. However, this growing partnership is not adequately supported by the existing regulatory and managerial architecture of China’s foreign-aid system. If the situation is left unchecked, the uncertainties and complexities involved in public-private partnerships may hurt the effectiveness of China’s aid provision and even have undesirable consequences on development. Considering the multitude of China’s development finance activities and the potential impact on recipient countries, it is imperative to take immediate actions to address PPP-related challenges and gaps to ensure the effective delivery of China’s development cooperation efforts.

Assumptions

Three basic assumptions underpin the theory of change of the DELTA Project:

Assumption 1. Addressing problems and gaps in aid provision will have a positive influence on overall aid effectiveness.

In reality, a multitude of factors can influence the effectiveness of aid. According to Howes’s model (2011), the determinants of aid effectiveness can be grouped into three categories: the quality of government of the recipient country, the quality of the donor, and the way the aid businesses is organized. From that perspective, efforts to improve aid provision could make a positive contribution to overall aid effectiveness, albeit one subject to intersections
with the other two categories. That said, the focus of the project remains on improving aid effectiveness through better aid provision, assuming that both the quality of the recipient government and the coordination with other aid providers are at acceptable levels and will not become major concerns in China’s aid effectiveness.

**Assumption 2.** China’s aid agencies are concerned with the effectiveness of the country’s overseas development cooperation.

As China’s aid modality moves from predominantly bilateral toward more multilateral and trilateral platforms and channels, its aid agencies are being put under greater pressure to deliver, not only in quantity but also quality of aid work. Although China is not a DAC member and does not share its aid data publicly, it does have internal oversight and accountability systems, which have been under scrutiny by the anti-corruption campaign launched by the country’s government. In this situation, and in the age of social media, Chinese aid managers are not immune to internal auditing and supervision by public opinion. In addition, the Chinese government is pursuing a new global strategy, the Belt and Road Initiative, of which expanded aid is a critical component. All these factors provide strong incentives for Chinese aid agencies to improve the quality of their work.

**Assumption 3.** It is both realistic and possible for Chinese aid agencies to improve the quality their PPP decisions and practices.

Aid agencies in China are transforming themselves with the aim of developing the managerial and technical capacity required for effective aid provision. Where regulation and oversight are weak, discretions in PPP decisions and practices can threaten efforts at quality improvement. The fact that aid agencies are held more accountable for the results of development cooperation than their private counterparts are incentivizes those agencies to
proactively improve the quality of the PPPs in which such transactions occur. Last but not least, although Chinese aid professionals have limited opportunities to interact with international development practices, they are passionate to learn from global experience and willing to translate knowledge, tools, and methods into their aid-management practices. These factors help lay the foundations for the potential improvement of PPP-related aid provision.

Causal Framework

As noted earlier, PPP in China’s development aid is ruled by multiple objectives. And that could be a challenge to the effectiveness of aid programs, which depends to a large extent on how well the diverse interests behind the objectives are balanced in the provision of aid. However, this challenge cannot be addressed solely by conventional capacity-building initiatives, due to the high knowledge burden imposed on aid managers by the scope of aid work. The DELTA Project therefore aims to make a change by improving the decision-making process of PPP-related aid provision, which could be made more effective by the adoption of multi-criteria decision-support tools. To reinforce this approach, the project also plans to enhance the efficacy of PPP-related management by adapting international experience, practices, and methods to strengthen ex-ante, intermediate, and ex-post management of PPP projects. The use of standardized approaches and internationally proven methodologies will further facilitate reflections and feedbacks that are conducive to the application of the multi-criteria decision-making model.
Intervention Strategy

To achieve these objectives, the DELTA Project plans to adopt an intervention strategy consisting of four steps:

• **Step 1.** Measure and describe China’s aid, restructure the problem by putting the difficult PPP issue back in the context of global development cooperation, and come to understand the motivations and major trends of China’s aid activities overseas, as well as the role that the private sector is playing.

• **Step 2.** Understand how PPP can contribute to improving China’s aid effectiveness, and identify major constraints and challenges in the decision-making processes of China’s aid agencies and programs that could influence the effectiveness of PPP.

• **Step 3.** Introduce the multi-criteria decision analysis (MCDA) tool, and discuss the applicability of the tool for overcoming the constraints and challenges identified in the previous steps by establishing a decision-support model to aid PPP-related decision-
making.

- **Step 4.** Take stock of international experience and practices, strengthening PPP-related aid management by adapting tested tools and methods that will enhance the rigor of the MCDA tool by integrating the support-decision methods into the operational procedures.

Therefore, the first half of the DELTA Project will adopt an analytical approach to diagnosing the problem and assembling evidence. The second half of the project will take a more practical approach focused on fostering an enabling environment for the translation and application of knowledge. The results of the quantitative and qualitative analysis in steps 1 and 2 will be interpreted and fed into in step 3, where the proposed solution, a PPP decision support model, is presented. Finally, the model will be linked to improvements in managerial and operational practices, which in turn will offer feedback on modifications and improvements to the model. Where possible, a specific case analysis will be conducted to run a demonstration of the model and obtain feedback and experience conducive to the further improvement.

### 2.2.2 Determinants of Success in Knowledge Translation

- **Ethical dimension.** The project focuses on the institutional and operational effectiveness of China’s aid decision-making, not aid delivery. Nevertheless, aid effectiveness will eventually be measured by the actual outcomes of development assistance, such as improvements in health status and in access and quality to services. The success of the project therefore will be embodied in the effective use of PPP arrangements in China’s overseas development cooperation that brings benefits to recipient populations, far beyond the project’s timeframe.

- **Political dimension.** The DELTA Project does not change the multiplicity of aid
motivations. The success of the project will instead be marked by the introduction of a participatory and transparent framework for catalyzing the transformation of China’s aid system toward more meaningful stakeholder participation, open dialogues, and logical decision making.

• *Policy dimension.* The DELTA project will be considered successful if Chinese aid policy makers improve their awareness of the importance of quality decisions and their willingness to apply interventions to improve the quality of decisions in the appraisal, design, and evaluation of PPP-based development cooperation projects.

• *Organizational dimension.* MCDA and other international tools, methods, and experience are included in the technical guidelines, standard operational procedures, and practice manual of China’s PPP-based development cooperation. Chinese aid managers receive initial training on these tools and methodologies to improve their aid decisions.

• *Programmatic dimension.* Relevant tools and methods are applied in pilot aid projects, with experience documented and feedback collected for future improvement.

2.2.3 DELTA Project Design

Goal and Objectives

The goal of the DELTA Project is to increase the effectiveness of Chinese aid by strengthening the strategic management of public-private partnerships. The overarching goal consists of two specific objectives:

a) Bring a greater degree of structure, analysis, and openness to the decision-making
process with regard to the use of PPPs.

b) Improve the operational efficiency of PPP arrangements by introducing and adapting international experience.

Through a combined approach, the DELTA Project seeks to help Chinese aid agencies improve the discretion and consistency in the management of PPPs by overcoming contextual and behavioral barriers and constructing an alternative decision-making model based on MCDA. The project also aims to reduce losses and misallocation of resources by reinforcing the operational efficiency of PPP arrangements. This integrated approach will support efforts to harness viable and conducive partnerships with the private sector and to eventually contribute to the effectiveness of Chinese aid cooperation in recipient countries.

Main Methods

Both quantitative and qualitative methods will be used in the DELTA Project. For the analytical parts, econometric methods will be used to discover the main features and potential determinants of Chinese aid. In addition, qualitative analysis based on observations and consultations will be used to assess the contextual and behavioral factors that influence aid decisions. As part of the proposed solution, MCDA will provide an extra stepping stone for constructing an alternative aid-decision model.

Multi-criteria decision analysis (MCDA) involves a diverse range of techniques for supporting the decision process, encompassing mathematics, management, psychology, social science, and economics. Government officials and practitioners worldwide have increasingly been using MCDA to appraise public policies and other options. As an analytical tool for navigating the context of multiple aid-modality options, MCDA is used in the DELTA Project to
establish alternative options and criteria, estimate their relative importance, and judge the contribution of each alternative to each performance criterion. To facilitate the process, the project uses a web-based MCDA software package that is simple and flexible and facilitates communication through intuitive graphical user interfaces.

**Host Organization and Stakeholders**

*The World Bank Group (WBG).* The World Bank Group strives to strengthen China’s partnership in support of African development. It hosts a China-World Bank Partnership Facility to support China’s health aid to African countries, and recently a new program was approved to facilitate China-Africa health collaboration and explore collaboration with key stakeholders, including health authorities, aid agencies and programs, and private partners in China. The process has also attracted the participation of other development partners, such as the Bill and Melinda Gates Foundation (BMGF) and DFID.

The WBG has extensive experience applying PPP arrangements in the health sector and has developed a series of knowledge products to support the engagement of the private sector in various development areas, including health (IEG, 2016). Working across health systems, WBG’s support of health PPPs varies from upstream policy support for the enabling environment, capacity building, and pipeline development, to downstream transaction and execution (IEG, 2016). PPP is also a potential model for WBG-China collaboration on health in Africa. My intention is therefore to align the DELTA Project with the WBG-China initiative, which will provide flexibility in the learning and adaptation of existing knowledge, raising both the profile and the influence of the DELTA Project and improving the acceptance and application of the project’s deliverables.

*Ministry of Commerce (MOFCOM) and Other Stakeholders.* A key Chinese agency
related to the DELTA Project will be the designated project management unit for the South-South Cooperation Fund under the Ministry of Commerce. This fund is a new multi-billion mechanism announced by the president, Xi Jinping, in 2015 to help developing countries implement their post-2015 development agendas. The taskforce was established in mid-2016 and is dedicated to the planning and management of South-South programs and projects. I worked with the taskforce for my field immersion project in the summer of 2016. The outcomes of the project included analysis and recommendations for the delivery strategies, managing principles, and organizing structure of the fund in its initial stage. The work laid a good basis for the DELTA Project.

The DELTA Project will also benefit from relationships with other key stakeholders, such as the Ministry of Finance, the National Health and Family Planning Commission (NHFPC), the Chinese Center for Disease Control (China CDC), and the Bill and Melinda Gates Foundation (BMGF). Where a case analysis is possible, the project will further involve government, public, and private entities in the recipient country. Other collaborating partners may include Chinese state-owned and private firms at various stages.

**My Role**

Under the DELTA project, I worked as a short-term consultant for the World Bank Group in collaboration with the Ministry of Commerce and other international and national stakeholders, as required by the work. The WBG terms of reference are closely related to the WBG-China partnership building, with a focus on South-South cooperation. It is therefore feasible to use the DELTA project to enrich and contribute to the collaboration.
Expected Results and Deliverables

The final products of the DELTA Project include a doctoral thesis, a personal journey statement, and other deliverables.

*DELTA Doctoral Thesis:* As the primary academic product of the DELTA Project, the thesis builds on competencies developed through the DrPH coursework, reviews the research literature, and integrates knowledge gained in field experience during the implementation of the project. The thesis has two main parts: an analytical platform and a statement of results.

- **Analytical platform:** The analytical platform states the PPP challenges for Chinese aid and reviews the relevant literature to describe the problem and justify the attention given to it. The review covers the nature of the problem, the cause for action, and models, policies, and strategies for improving the use of PPPs for health aid, thus providing a conceptual and scientific foundation of knowledge for the DELTA Project. Next, it turns to the interventions and strategies that make up the action part of the project. It develops the theory of change that underpins the project, using logic and evidence. This section also includes a discussion of the project strategy: a detailed description of the design, goals, and expected outcome. The analytical platform also incorporates discussions of other important determinants of success in knowledge translation, such as ethical, political, organizational, programmatic, and policy dimensions.

- **Statement of results:** The results section presents a narrative discussion of the degree to which the stated goals and objectives were achieved. Part of it focuses on the four steps of the analytical process and related learning in the project period. The analytical frameworks and theory of change are used to explain the results, and the statement is based on evidence. It includes a discussion of how the host organization could benefit from the
project and what implications there may be for future partnerships with China on PPP-related aid. The results statement also presents an opportunity to reflect on how the project can contribute to broader learning in public health, and proposes questions and topics for future investigation.

**Personal Journey Statement:** Another set of deliverables focuses on personal growth and professional development. Through a personal journey statement, I reflect on my engagement and facilitation of dynamic processes that involve substantive knowledge translation, active listening, and persuasion skills across the landscape of stakeholders, and constructive development for individual and organizational learning. The statement also documents my experiences in exercising appropriate leadership styles, inspiring and supporting multi-sectoral teams, and improving my interpersonal skills towards more mindful and effective action while adapting to multi-cultural situations. The Statement further describes the DELTA Project as an opportunity to grow my professional network and explore, motivate, and harness potentials to maximize the collective gains.

**Other Deliverables:** Building on the analytical platform and the theory of change, a set of other deliverables are developed to facilitate the appropriate use of PPPs in China’s development cooperation on health. On the basis of international experience, the thesis further analyzes the pros and cons of the use of PPPs, and summarizes the main experience and lessons learned about the development of operational frameworks and practical tools. Based on the final requirements of the host and partner organizations, the deliverables also include

- Policy notes with recommendations on the strategic use of the PPPs for greater effectiveness of aid;
- Brief guidelines for building institutional capacity for the choice of development-
cooperation model;

- A set of decision and operational tools that support the strategic management of PPPs;

and

- Potentially a case study that provides a specific example of China’s health aid being provided with the engagement of private sector partners.

Execution Plan

An executive plan including the major activities of the DELTA Project is shown in Table 2. During the project, I maintained close contact with the DELTA Committee chair and members, and updates were provided on a regular basis. In-person and virtual progress report meetings were held with committee members where it was necessary to help the committee monitor the progress of the project and my experiences at the host organization. Three progress reports were completed, at the 3-, 5-, and 8-month marks.
# Table 2. Schedule of the DELTA Doctoral Project

<table>
<thead>
<tr>
<th>DELTA Stage</th>
<th>Instruments and Activities</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature Review</td>
<td>Unstructured interviews&lt;br&gt;Literature review&lt;br&gt;Secondary data collection</td>
<td>June 2017</td>
</tr>
<tr>
<td>Restructuring the Problem</td>
<td>Secondary data analysis&lt;br&gt;Focus group discussion</td>
<td>July 2017</td>
</tr>
<tr>
<td>Assembling Evidence</td>
<td>Context analysis&lt;br&gt;Quantitative analysis&lt;br&gt;Unstructured interviews</td>
<td>August – September 2017</td>
</tr>
<tr>
<td>1st Progress Report</td>
<td>Meeting with the committee members and turning in Progress Report 1</td>
<td>October 18, 2017</td>
</tr>
<tr>
<td>Constructing Alternative Decision Models</td>
<td>Qualitative analysis&lt;br&gt;Development of other deliverables</td>
<td>October – November 2017</td>
</tr>
<tr>
<td>Taking Stock of International Experience</td>
<td>Development of other deliverables&lt;br&gt;Demonstration</td>
<td>October – November 2017</td>
</tr>
<tr>
<td>2nd Progress Report</td>
<td>Meeting with the committee members and turning in Progress Report 2</td>
<td>November, 2017</td>
</tr>
<tr>
<td>Feedback &amp; Improvement</td>
<td>Thesis writing&lt;br&gt;Submission of analytical results</td>
<td>December 2017</td>
</tr>
<tr>
<td>Thesis drafting</td>
<td>Thesis Writing&lt;br&gt;Submission of a first draft</td>
<td>February 20, 2018</td>
</tr>
<tr>
<td>3rd and Final Progress Report</td>
<td>Meeting with the committee members and turning in Progress Report 3</td>
<td>March 1, 2018</td>
</tr>
<tr>
<td>Regular monthly meetings</td>
<td>Meetings and /emails with the committee chair, and reporting updates.</td>
<td>Monthly</td>
</tr>
<tr>
<td>Submission of final draft</td>
<td>Submission of the revised draft</td>
<td>March 20, 2018</td>
</tr>
<tr>
<td>DELTA Oral Final Examination</td>
<td>Presentation</td>
<td>April 6, 2018</td>
</tr>
<tr>
<td>Submission of final thesis</td>
<td>Submission of the revised thesis</td>
<td>April 20, 2018</td>
</tr>
</tbody>
</table>
PART III. STATEMENT OF RESULTS

3.1 Summary of Results

The goal of the DELTA Project is to increase the effectiveness of Chinese aid by strengthening the strategic management of public-private partnerships. Through the eight-month project, the following milestones have been met to achieving the two specific objectives of the overarching goal:

a) Bring a greater degree of structure, analysis, and openness to the decision-making process with regard to the use of PPPs.

*Achievement.* A computer-based MCDA program was successfully introduced as a decision-support tool to help Chinese aid managers with PPP-related decisions. The tool was adapted on the basis of the analysis of contextual and behavioral factors that might affect the effectiveness of PPP decisions.

b) Improve the operational efficiency of PPP arrangements by introducing and adapting international experience.

*Achievement.* A set of reports, policy notes and guidelines was developed to improve the efficiency of the PPP-related operations of Chinese aid agencies. In addition, a new World Bank program has been approved to support China-Africa health collaboration, with PPP identified as a main approach.

3.1.1 Features and Trends of China’s Development Finance

Despite China’s emergence as a provider of global development finance, there is a general lack of knowledge about the cross-sectoral and cross-national distribution of its aid
money (Strange et al., 2013). In recent years, the Chinese government has begun to disclose some aid information, for the most part broadly aggregated information, through two white papers on foreign aid published in 2011 and 2014 (MOFCOM, 2011). However, project-level data are still scarce. As the primary interest of the DELTA Project is to help China’s aid agencies improve their decision-making in health cooperation projects involving PPP, it is crucial to understand the patterns of Chinese aid manifested by its overseas aid projects, and key factors that might be driving relevant aid decisions.

**Observations on China’s Health Finance in Africa**

To this end, the AidData database version 1.2 (Strange et al., 2017) was obtained and analyzed. It records 2,647 projects of official Chinese development finance in Africa from 2000 to 2013. The main objective of the analysis was to gain insights into the considerations that may underlie the decision making in China’s development aid projects, particularly health aid, with a focus on elements of private-sector engagement. The main findings of the analysis were shared with the host organization—the World Bank’s Health, Nutrition, and Population team of its African Bureau—to provide additional information to assist their partnership strategy on China-Africa health collaboration. Below are some of the key findings of the analysis.

*Observation 1.* China’s health finance to Africa is steadily increasing in scale and coverage. On average, China provides about $480 million US to finance 40 health projects in Africa yearly.

The data show that the majority of Chinese development finance went into the economic sector, mainly to support industrial development and infrastructure projects. The health was the second most frequent recipient of investment, accounting for 20% of the projects, as shown in Figure 4. Despite their high number, China-funded health projects in Africa are on average
smaller than non-health projects. About 43% of the health projects had funding of less than $1 million US. Only 15% of non-health projects had so little (Figure 5). After taking out the relatively sizable water and sanitation projects, the average means of health and population projects are even smaller (Table 3).


<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Non-Health</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Projects</td>
<td>557</td>
<td>2,090</td>
<td>2,647</td>
</tr>
<tr>
<td>Project with a value</td>
<td>219</td>
<td>1,298</td>
<td>1,517</td>
</tr>
<tr>
<td>Mean Project Size (in millions)</td>
<td>31</td>
<td>101</td>
<td>91</td>
</tr>
<tr>
<td>Subsector: WASH</td>
<td>72</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Subsector: Population</td>
<td>0.2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Subsector: Other Health</td>
<td>5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total Project Funding (million US$)</td>
<td>6,762</td>
<td>137,929</td>
<td></td>
</tr>
<tr>
<td>Average Projects Per Year</td>
<td>40</td>
<td>149</td>
<td>189</td>
</tr>
<tr>
<td>Average Yearly Funding (million US$)</td>
<td>483</td>
<td>9,852</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 4. Frequency and Amount of Chinese Development Financing to Africa by Sector (2000-2013)](image-url)
**Figure 5.** Comparison of Funding Size Distribution by China-financed Health and Non-Health Projects in Africa (2000-2013)

**Observation 2.** China’s health financing has a diversified portfolio, with the construction of health facilities, water and sanitation, and medical equipment supplies and drugs accounting for an increasing proportion in recent years.

A closer look at the sub-categories of health projects indicates that sending medical teams to African countries remained an important approach but no longer dominated China’s health aid to Africa (Figure 5; CNTV, 2013).*** The monetary cost of the activities was unavailable or under-estimated in the database. A likely explanation is that the cost was absorbed by provincial governments rather than disbursed by the central government.

AidData documented malaria as the only disease-specific priority in China’s health aid to Africa. However, the scope for malaria-related health finance went far beyond sending doctors. It also involved the donation of anti-malaria drugs and the construction and equipment of facilities for treatment, laboratory testing, and research and training. The data further provide evidence that China is making efforts to fulfill its commitment to building thirty malaria prevention

*** The practice is part of the peer-supporting mechanism system that the Chinese government has adopted for medical aid since 1963. Under this system, about 180,000 doctors and nurses (person time) have been dispatched by 2012 from 27 provinces, municipalities and autonomous regions in China.
and treatment centers in Africa (FOCAC, 2012).

Table 4 Categories of China-financed health projects in Africa (2000–2013).

<table>
<thead>
<tr>
<th>Category of Health Project</th>
<th>No. of Projects</th>
<th>Amount US$ mil</th>
<th>Mean US$ mil</th>
<th>Median US$ mil</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Medical Support</td>
<td>202</td>
<td>65.36*</td>
<td>0.32</td>
<td>0</td>
</tr>
<tr>
<td>Malaria Prevention and Treatment</td>
<td>106</td>
<td>140.74</td>
<td>1.33</td>
<td>0.10</td>
</tr>
<tr>
<td>Hospital Construction &amp; Rehabilitation</td>
<td>87</td>
<td>1,790.24</td>
<td>20.58</td>
<td>7.99</td>
</tr>
<tr>
<td>Water &amp; Sanitation</td>
<td>60</td>
<td>4,466.45</td>
<td>74.44</td>
<td>10.18</td>
</tr>
<tr>
<td>Medical Equipment &amp; Medicine</td>
<td>46</td>
<td>138.05</td>
<td>3.00</td>
<td>0.12</td>
</tr>
<tr>
<td>Public Health &amp; Other Disease Control</td>
<td>30</td>
<td>59.47</td>
<td>1.98</td>
<td>0.04</td>
</tr>
<tr>
<td>Health in Multi-Sector Project</td>
<td>18</td>
<td>101.47</td>
<td>5.64</td>
<td>0.17</td>
</tr>
<tr>
<td>Health Education &amp; Training</td>
<td>8</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>557</strong></td>
<td><strong>6,761.79</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Cost of dispatching medical teams under-documented

According to information released by official sources, China pledged to help build 28 new hospitals in the region during the period. This explains the large amount of money recorded under hospital construction and rehabilitation (Table 4). Also worth noting is the considerable number of projects involving medical equipment and medicine provision, of which both the number and the amount of funding have been growing steadily for years, suggesting the active engagement of the Chinese private sector in the process— that is, medical equipment and device manufacturers and pharmaceutical companies (Figure 6).
Observation 3. There is a trend toward more mixed funding structures and partnership strategies in China’s health finance.

State involvement is decreasing in China’s development finance, although this is less significant in the health sector. However, despite the fact that the health projects in Africa are smaller, developmental by nature, and grant-reliant, there is a tendency toward mixed funding structures and loan-supported health initiatives, indicating the possible crowding-in of private finance.

As there is no clear definition of China’s development finance, AidData uses the definitions from the OECD categorization scheme to describe its type and nature. Figure 7 shows that majority of the health projects fall under ODA-like categories; that is, technical assistance funded by grants. Projects supported by loans, export credits, and joint ventures, (i.e., OOF, vague financial and official investment) together account for only 13% of the total funding. By comparison, the proportions of non-ODA-like projects among non-health projects are much higher.
Figure 8 further illustrates that average project funding grows as concessionality and state involvement decrease. A likely explanation is that as the private sector engages, it tends to bring more commercial loans, private investment, and other non-concessional funding to the project. A similar trend can be observed for the health sector and for other sectors in general. However, the explanatory power of the analysis is constrained by the limited number of observations and their concentration in only a few classification groups, as well as by the outlier problem.

![Figure 7. Funding Type of Health and Non-Health Projects (left)](image)

![Figure 8. Project Size by Level of Concessionality and State Involvement (right)](image)

The analysis of funding types of China’s development projects further confirms the change in funding structure. Figure 9 reveals that from 2000 to 2013, loans (in dark red) became an increasingly dominant type of funding in China’s development finance to Africa. The trend is similar, although more volatile, in the health sector.
The data further reveal that 7.7% of projects are labeled as “mixed with some development,” with other types of intent being commercial, development, mixed with no development, and representational.††† Because intent reflects the nature of the cooperation to a large extent, it can be used as a crude proxy of private engagement. The projects having mixed intent with a development component were therefore considered “quasi-PPP” projects. The data show that on average these projects are seven times as large as projects with only development intent (USD 64.5 mil versus 9.1 mil). And logistic analysis further found that by average, the PPP project is 10.4 times as likely as the non-PPP project to have $10 mil or more funding, 2.8 times as likely to be a co-financed project, three times as likely to have a duration longer than 2 years, and 2.6 times as likely to have two or more partners involved in its planning and

††† All projects in the database were classified according to the perceived intent of the finance provider. The broad categories covered by “donor intent” include: development in the recipient country (development), commercial interests in the donor country (commercial), the representational interests of the donor country or a donor-recipient relationship (representational), or a combination of two or more donor motivations (mixed). Details of the coding were provided in Strange, Austin, Mengfan Cheng, Brooke Russell, Siddhartha Ghose, and Bradley Parks. 2017. Tracking Underreported Financial Flows (TUFF) Coder Instructions, Version 1.3. Williamsburg, VA: AidData.
implementation, indicating a much more complicated funding and partnership structure for private-engagement projects.

**Observation 4.** China’s development finance has broad geographical coverage but was relatively concentrated, especially in the health sector.

The analysis further found that China’s development finance is spread among 51 countries in the region (Figure 10). The AidData database had no record of China’s development finance in countries with which it lacked diplomatic relations as of the date of entry.‡‡‡

![Figure 10. Geographic Distribution of China-Financed Projects in Africa, in millions of US dollars. (2000–2013): all projects (left) vs. health projects (right)](image)

China’s development finance was also relatively concentrated geographically, as shown in Table 5. The amount received by the top ten countries accounts for two-thirds of the total

‡‡‡ No record for Burkina Faso, Gambia, and Swaziland. Among the countries Burkina Faso and Swaziland do not have diplomatic relations with China, and Gambia-China diplomatic ties was not restored until 2016.
Chinese funding to Africa. The concentration is even higher in the health sector, where nearly 90% of the funding went to the top ten countries. Countries receiving more funding also had bigger projects. The average project size in the top ten countries (regional programs excluded) was twice that of the total average. And for health projects, it was is 20 times as great, suggesting even more skewed distribution of health funding among African countries.

Table 5. Top 10 African Countries Receiving Development Financing from China (2000-2013)

<table>
<thead>
<tr>
<th>Country</th>
<th>Funding, All Projects (USD millions)</th>
<th>Funding, Health Projects (USD millions)</th>
<th>No. of Projects</th>
<th>No. of Health Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>12,131.02</td>
<td>1,898.44</td>
<td>Zimbabwe</td>
<td>Angola</td>
</tr>
<tr>
<td>Sudan</td>
<td>10,354.35</td>
<td>1,136.29</td>
<td>Angolan</td>
<td>Tanzania</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>10,205.01</td>
<td>1,044.97</td>
<td>Ghana</td>
<td>Uganda</td>
</tr>
<tr>
<td>Ghana</td>
<td>10,162.85</td>
<td>879.94</td>
<td>Tanzania</td>
<td>Zimbabwe</td>
</tr>
<tr>
<td>Nigeria</td>
<td>9,091.60</td>
<td>357.55</td>
<td>Ethiopia</td>
<td>Liberia</td>
</tr>
<tr>
<td>Congo Dem.</td>
<td>8,926.74</td>
<td>254.01</td>
<td>Kenya</td>
<td>Cameroon</td>
</tr>
<tr>
<td>South Africa</td>
<td>8,824.23</td>
<td>162.79</td>
<td>Liberia</td>
<td>Ghana</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>8,133.74</td>
<td>149.24</td>
<td>Namibia</td>
<td>Zambia</td>
</tr>
<tr>
<td>Africa Reg.</td>
<td>6,448.70</td>
<td>108.76</td>
<td>Sudan</td>
<td>Kenya</td>
</tr>
<tr>
<td>% of total</td>
<td>66.8%</td>
<td>90.3%</td>
<td>38.5%</td>
<td>41.1%</td>
</tr>
</tbody>
</table>

Observation 5. China’s development financing may take health needs into consideration in the allocation of resources, but the predictive evidence is weak.

Analysis of health financing by country does not reveal significant relationships between the amount of the funding and the recipient country’s major health outcome indicators, but this is probably affected by the high proportions of missing values on health projects. However, cross-sectional analysis shows some evidence that China financed greater numbers of health projects in African countries with more reported malaria cases and fewer available physicians. There is
also evidence of a crude relationship between life expectancy and number of China-financed health projects over the years (Table 6; detailed analysis in Appendix 1).

Table 6. Results of Regression Analysis: Health Projects (dependent variable = total number of China-financed projects in health sector)

<table>
<thead>
<tr>
<th></th>
<th>GNI per capita</th>
<th>MMR</th>
<th>M-5b</th>
<th>LE</th>
<th>Malaria Case nr.</th>
<th>Hospital bed</th>
<th>Physician nr.</th>
<th>Obs./Group</th>
<th>Adj R²</th>
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<tr>
<td>Simple Regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.001**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>(0.015)</td>
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<td>0.002</td>
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<td>46</td>
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<td>0.041*</td>
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<td>-0.268*</td>
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<td>47</td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td></td>
<td></td>
<td></td>
<td>0.007***</td>
<td></td>
<td></td>
<td></td>
<td>38</td>
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<td></td>
<td>-1.91*</td>
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<td></td>
<td></td>
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<td>-9.59***</td>
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<tr>
<td>Multiple Regression</td>
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<td></td>
<td></td>
<td>0.006**</td>
<td>-14.15</td>
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<td>Model 4</td>
<td></td>
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<td></td>
<td>(0.012)</td>
<td>(0.141)</td>
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<td></td>
<td></td>
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<td></td>
<td>0.001</td>
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<tr>
<td></td>
<td>(0.540)</td>
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<td></td>
<td>(0.168)</td>
<td>(0.141)</td>
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<tr>
<td>Model 5</td>
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<td>0.013</td>
<td>0.0056**</td>
<td>37</td>
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<td></td>
<td>(0.950)</td>
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<td></td>
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<td>(0.025)</td>
<td>(0.171)</td>
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<td>Model 6</td>
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<td>-4.59e–08</td>
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<td>102/36</td>
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<td>(0.628)</td>
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<td></td>
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<tr>
<td>Model 7</td>
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<td></td>
<td></td>
<td></td>
<td>0.553</td>
<td>0.052</td>
<td>101/36</td>
<td>0.0045</td>
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<td></td>
<td></td>
<td>(0.873)</td>
<td>(0.988)</td>
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<td>Model 8</td>
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<td>-7.36e–09</td>
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<td>101/36</td>
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<td></td>
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<td></td>
<td></td>
<td>(0.938)</td>
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<tr>
<td>Model 9</td>
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<td>3.52e–08</td>
<td>101/36</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.974)</td>
<td>(0.677)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion of the Observations

The analysis is conducted in the awareness of several limitations. First, the data are constructed on a media-based database, which inherits the strengths and the obvious limitations of the methodologies. A lack of updated information, under-reporting, and overestimation of project values all affect the analytical power and generalizability of the findings.
Second, in addition to the noisiness of the data, the analysis is confined to country-level information. The lack of sub-national and project-level details certainly affects the study’s ability to yield more comprehensive conclusions, which would require accurate and contextual observations. Third, given the complex nature of aid provision, the omitted variables may further bias our estimation results. Last, the conclusions are based on the assumption that a dominant “pattern” of aid allocation exists and actually affects China’s decisions about sending development finance to Africa. This assumption may be challenged in light of the fact that aid decisions are actually made by hundreds of aid managers, in dozens of public entities, motivated by diverse organizational mandates and interests.

Nevertheless, even when these limitations are taken into consideration the analysis provides contextual background for the DELTA Project by measuring and describing China’s development finance using empirical data. It further reveals the complex nature of aid decisions, in the multiple factors that must be taken into consideration. By bringing empirical insights into the discussion, the analysis facilitates conversations on the validity of constructing models to assist in complex decisions. The exercise further provides technical input to the construction of the decision model, with regards to the selection of evaluation criteria, which will be discussed in the following sections.

3.1.2 PPP for China’s Development Cooperation

The above analysis helps us sketch the evolution of China’s development aid with new features and trends. The patterns continually intersect with the broader strategic, operational, technical, and structural factors discussed below, which provide the logics governing the choice of public-private partnerships in China’s development finance overseas:

• **Strategically**, guided by a hybrid paradigm of neorealist and neo-Marxist international
relationships, China’s leaders articulated a global vision in which “international affairs are jointly managed, the world order is jointly built, and economic and social progresses are shared” (Yang, 2017). This positioning indicated China’s willingness to step up in global leadership and play a more active international role (Saich, 2017). As a firm defender of economic globalization, China’s aid policy will inevitably interact with the country’s efforts to strengthen its global partnerships, deepening globalization and economic integration.

- **Operationally**, both the volume and the scale of Chinese global aid are increasing rapidly. However, the foreign-aid architecture remains largely the same as it was decades ago. Because dramatic expansion of official aid arms is unlikely, at least in the near future, the need for technical knowledge and operational structure to support the delivery of aid programs makes new partnership strategies a necessity—for example, partnerships with the private sector.

- **Technically**, the scope of development cooperation is extending beyond the boundary of conventional foreign aid to areas less familiar to the public sector,—for instance, from simply dispatching medical teams to managing hospitals and integrated health services, areas in which the private sector has advantages and may be more experienced and efficient in delivering the desired results.

- **Structurally**, although input-orientation remains a problem in China’s development aid, attention is gradually shifting toward the long-term impact of development cooperation and mutual benefits—a goal that the public sector alone cannot achieve due to concern over creating aid reliance. A well-structured PPP modality may offer solutions to these problems.
In addition, it is well recognized that the incentives of the private sector further interact with aid providers’ agendas and influence the development and application of PPPs. Confronted with increasingly intense competition in the domestic market, Chinese firms are eager to embrace the sustainable-development opportunities presented to them in the global market. The pursuit of a wider profit margin and access to low-cost financing also fuel the zeal of Chinese firms to “go global.” From a risk-management perspective, PPP is also not a bad deal for the private sector—the high political risks of developing countries can be better managed through partnerships with the government’s aid bodies.

The above considerations provide justification for making public-private partnerships a tool for organizing and providing aid, even in development-oriented, grant-reliant social sectors like health. In fact, this change has been part of China’s aid reform since the mid-1990s, leading to structural adjustments in different historical phases to match the leading political, economic, and social considerations of the time. Four phases of Chinese aid are summarized in Table 7 to illuminate the logic behind the transformation of aid and PPP as an aid instrument.
### Table 7. Transformation of Chinese Aid

<table>
<thead>
<tr>
<th>Phase (year)</th>
<th>Context</th>
<th>Principle</th>
<th>Feature</th>
<th>Aid Instruments</th>
<th>Determinants of Aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: 1950–1974</td>
<td>China supported African countries’ independence movements, China became a member of the UN.</td>
<td>Eight principles (1964)</td>
<td>Increasing amount and share of GNP.</td>
<td>Grants, interest-free loans</td>
<td>Driven by political and ideological considerations toward favorable international environment.</td>
</tr>
<tr>
<td>II: 1975–1989</td>
<td>China’s economic reform and opening-up policy, adjustment to more programmatic foreign policy.</td>
<td>Four principles (1983)</td>
<td>Declining amount and share of GNP, external relations serve for economic development.</td>
<td>Interest-free long-term loans, grants, with stricter conditions.</td>
<td>Economic motives becoming more relevant.</td>
</tr>
<tr>
<td>IV. 2006–present</td>
<td>China engages in regional and global affairs, building “community of common destiny.”</td>
<td>Forging new strategic partnerships; sharing China’s development experience through South–South cooperation.</td>
<td>Growth in volume and coverage of development finance, increasingly diversified portfolio, and emphasis on sustainable outcomes.</td>
<td>Aid as a component of comprehensive development cooperation, e.g. PPP.</td>
<td>Multiple considerations targeting mutual benefits and win-win situations.</td>
</tr>
</tbody>
</table>

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§§§ Adapted from the White Paper on China’s Foreign Aid (2011)
The logic of PPPs is thus shown to structurally harmonize various complex considerations of Chinese aid. The logic implies that PPP as an instrument for development aid is inevitably more complicated than in its original form in the economic and infrastructure sector. Only two parties are involved in traditional PPPs (the national or local government and a private counterpart), but the newer version of PPP needs to balance the diverse and sometimes conflicting interests of three parties and satisfy the overlapping considerations of aid provider, aid recipient, and private-sector partners, as shown in Figure 11. To distinguish the two, we call this newer version of the partnership “PPP for development aid,” or South-South PPP (SSPPP). While the DELTA project looks at PPP modalities from the perspective of aid providers, it acknowledges that the incentives of private partners and recipient countries are the main driving forces behind the story and will inevitably interact to shape the collaboration. In practice, aid providers need to properly weigh these factors and balance them with their own incentives to ensure the successful organization of PPPs.

Figure 11. Logics of SSPPPs: Interaction of Multiple Considerations
Challenges for SSPPPs in the Health Sector

Although PPPs are more common in the economic and infrastructure sector, it is worth highlighting the unique features that distinguish their application in the health sector. Table 8 compares health PPPs, infrastructure PPPs, and regular grant projects. It is clear that its distinct traits make health PPP more complex than the other two, which partially explains the mixed outcomes of health PPPs worldwide. Keeping the challenges in mind, aid providers may still consider PPP a viable option for China, primarily because of its potential in tackling specific problems in overseas health aid.

Table 8 summarizes some of these potential advantages, such as a more reasonable risk structure in which the private sector takes more of the risks that they are better able to deal with; improved sustainability as a result of taking the operations costs of health facilities into consideration; and greater availability and quality of services and products, with stronger accountability systems. The task, however, requires a robust design and implementation-support system, which needs to be taken into consideration in the early stages of the project development. For aid agencies that are interested in reaping the benefits of health PPPs while avoiding or mitigating the problems of the modality, a sound decision system is required, especially in the project-identification and appraisal phases.
Table 8. Comparison between Health PPPs, Infrastructure PPPs, and Grant Projects

<table>
<thead>
<tr>
<th></th>
<th>Grant-based Health Project</th>
<th>Economic or Infrastructure PPP</th>
<th>Health PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost structure</strong></td>
<td>Short-term, usually not covering costs for facility construction and operation</td>
<td>High up-front cost, significantly lower cost for operation and maintenance</td>
<td>Up-front cost could be high, depending on type and scale of healthcare facility.</td>
</tr>
<tr>
<td><strong>Risk structure</strong></td>
<td>Low overall risk, technical risk associated with chosen interventions</td>
<td>Mainly market-driven, demand risk high</td>
<td>Depending on the structure of healthcare system, demand and political risk could be high</td>
</tr>
<tr>
<td><strong>Service or product provision</strong></td>
<td>Specific service or product line through vertical program</td>
<td>Relatively easy to standardize, e.g. power, clean water</td>
<td>Highly diverse and not easily grouped</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>Limited to the scope of the project.</td>
<td>Highly measurable using key performance indicators</td>
<td>Harder to measure, with large variance among interventions</td>
</tr>
<tr>
<td><strong>Source of revenue</strong></td>
<td>Grant-reliant, no mechanism for revenue generation.</td>
<td>Commonly collect fees from users</td>
<td>A complex mix of public and private payments.</td>
</tr>
<tr>
<td><strong>Efficiency gain</strong></td>
<td>Limited</td>
<td>Largely through life-cycle cost containment</td>
<td>Cost-saving may clash with public interest</td>
</tr>
<tr>
<td><strong>Variability of technology</strong></td>
<td>Focusing on mature, scientifically and practically tested technology</td>
<td>Service delivery technology and organizational model change relatively slowly</td>
<td>Risk associated with more rapid change in healthcare technology and organizations</td>
</tr>
<tr>
<td><strong>Bankability</strong></td>
<td>Not applicable</td>
<td>High, with structured cash flow.</td>
<td>Lower, with more and varied uncertainty depending on PPP model.</td>
</tr>
<tr>
<td><strong>Timeframe</strong></td>
<td>Short-term</td>
<td>Long-term</td>
<td>Shorter than infrastructure PPP</td>
</tr>
</tbody>
</table>
3.1.3 Contextual and Cognitive Barriers in SSPPP Decision Making

According to the logic of SSPPP and the above analysis, a successful health PPP project pursues a common ground of interests and protects the welfare of each party from being overly “captured” by certain considerations of the others. Success relies on sound judgment in all phases of project management, with the screening and identification of appropriate SSPPP proposals being exceptionally important, given the effort required to develop a full proposal. Taking project appraisal as an example, decision-makers need to deliberatively assess every aspect of a proposal to make informed judgments on its potential, and this requires consideration of a broad set of factors, including political, economic, operational, and technical ones, as discussed earlier. In principle, the process should be based on reasoning and trade-offs, which require effort and reflection and are inevitably time consuming. However, the judgment and decisions of aid professionals may not always be as consistent and rational as they should. Behavioral science tells us that there are problems related to decision-making patterns that may impede aid agencies and their staff from achieving their goals.

Noise in PPP-Related Aid Decision Making

Inconsistency, or variation, also known as “noise in the system” is one type of error in PPP-related decision making. Researchers have found that professionals often make decisions that deviate significantly from those of their peers, and even from their own prior decisions and the rules they themselves claim to follow (Kahneman, Rosenfield, Gandhi, & Blaser, 2018). The DELTA Project provided an opportunity to closely observe behavioral patterns in China’s new South-South project unit under the Ministry of Commerce. It turned out, unsurprisingly, that short-handed staffs struggled constantly with paperwork, meetings, procedures, and deadlines, and not all decisions were made deliberatively and reflectively. In fact, as we know from
behavioral studies, most of the time professionals in development organizations make decisions in a fast and intuitive way (WBG, 2015). This should be a concern for China’s aid agencies, given the large potential impact of SSPPP projects on recipient populations. In an environment where decision support systems are weak, people automatically process the information that is most salient to them, which can lead them to overlook key information and critical consequences (WBG, 2015). And the variation in human judgment could get even larger when multiple factors need to be taken into consideration at the same time, as in the case of PPP screening and identification.

*Measuring Noise in PPP Decisions*

To improve the quality of decisions, it is first and foremost helpful for aid organizations and managers to be aware the existence of noise in their decisions. As an integral part of the intervention strategy of the DELTA Project, I carried out a simple experiment to assess the level of the inconsistency problem at the South-South project management unit. The experiment was designed as part of a survey conducted to assess the capacity-development needs for PPP-related aid program staff. To avoid introducing pre-experiment bias, the purpose of the survey was framed as “to understand aid professionals’ needs to guide the design of targeted capacity-development initiatives.” Twenty-one people took survey, including staff and managers in the South-South program unit and leading experts and consultants who make PPP-related decisions in the DELTA partner organization in China. Survey participants were asked to complete three tasks: (i) assign a number from 1 to 5 to the importance of various factors that need to be taken into consideration in PPP project appraisal; (ii) rank the importance of various types of risks in an average PPP project, and (iii) given short descriptions of two PPP projects, select the one they would rather support.
Figure 12 shows how aid manager’s judgments diverge on various assessment criteria for PPP projects. Their opinions deviate significantly from those of their peers particularly on the importance of the scale, duration, leverage ratio, local partnerships, social & environmental impact, cost-effectiveness, and operational capacity of the project. Even with items on which people reach a higher level of consensus, such as risk level, rationale, outcome, and sustainability, nearly half of participants still disagree.
Figure 12. Inconsistent weighting of PPP criteria
Similar divergence was found in the importance ranking of risk factors in Table 1. In comparison with the overall ranking, many aid managers have surprisingly different “intuitions” from their peers when weighing certain risk factors into the PPP evaluation, especially when it comes to demands and commercial risks, technical risks, and operational risks.

Table 9. Importance Ranking of PPP-Related Risks

<table>
<thead>
<tr>
<th>Risks</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal, regulatory, and policy risks</td>
<td>12</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Demands and commercial risks</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Technical risks</td>
<td>0</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Construction risks</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Operational risks</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Disaster and force majeure</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>6</td>
</tr>
</tbody>
</table>

The answers to the third question also revealed deviation in judgment. In this question, brief descriptions were given of two hypothetical PPP proposals that varied in sector, size, leverage ratio, duration, partnerships, demands, and stage of development (identification versus preparation). Participants were asked to choose the case that they preferred to support. Out of 21 people, 12 (57%) chose proposal A, and 9 (43%) chose proposal B. In other words, where independent decisions must be made, nearly half of aid managers will make completely different choices from their peers.

The exercise also confirmed that large variance exists in the judgment of aid professionals when individual decisions are made in assessing various aspects of PPP proposals. Given the lack of well-defined decision-making criteria and processes, this variance can lead to inconsistent decisions between aid professionals and over time, which will increase the noise of PPP-related decisions in the system.
**Bias in PPP-Related Aid Decision Making**

In addition to the noise in human judgment, the problem may also be deeply rooted in cognitive bias, another main cause of poor decision making, in which people take actions in a way that introduces systematic error into the decision-making process. Behavioral economics studies have shown that many cognitive biases can impair the ability of aid agents to objectively evaluate risks and deliberate effectively on PPP-related decisions (Beshears & Gino, 2015). On the basis of observations of and interactions with aid professionals of the South-South project management unit, I found that the following biases may exist in the decision-making process of China’s aid provision:

- **Present bias.** In comparison with the long-term, often uncertain gains (e.g., development impact) of aid projects, aid managers give more value to immediate rewards (e.g., timely fund disbursement and delivery of results). In PPP project appraisal, this bias can lead to serious underestimation of critical proposal elements, such as sustained success beyond the project phase.

- **Groupthink.** Members of a group tend to subordinate their thinking to authorities or to strive for consensus at the cost of realistic appraisal of alternatives. In a typical decision-making environment at a Chinese organization, an authority superior in administrative grade, professional experience, or academic background usually dominates the discussion, and others tend to follow the tune and offer complementary input rather than challenging the authority with different opinions.

- **Confirmation bias.** People tend to place more value on evidence that is consistent with an initially anchored judgment (e.g., that a PPP project will be superior to publicly financed projects, or vice versa; or that an economically sound PPP project will surely
succeed in delivering development results) and fail to independently assess evidence that contradicts this judgment.

- **Irrational risk aversion.** In an environment where people feel more acutely about losses and risks, aid managers tend to defer decisions and avoid taking even reasonable risks. In the case of PPP projects, fear of losses may lead to overestimation of certain risks to the point that they overshadow the other, more important considerations.

Following is a detailed analysis of a potential risk-management paradigm for PPP-related decisions, based on observations of and interactions with selected aid professionals.

Most if not all Chinese government systems have a low tolerance of risk. From the perspective of principal-agent theory, the source of the problem lies in the information asymmetry caused by the difficulty, for aid agencies, of accurately evaluating the achievements of their managers—that is, the results of the aid (Besley & Ghatak, 2003). Because the measurement of aid results is very “noisy,” reward does not provide an effective incentive. Besides, the staff members of aid agencies are civil servants. The “limited liability” associated with their status further constrains how much aid agencies can use common incentive tools like punishment to solve the problem (Besley & Ghatak, 2003). When the environment has a low tolerance of risk, aid managers tend to be very sensitive to perceived levels of risks. Risk-minimization hence becomes an important drive behind day-to-day aid decisions.

To better describe how a low risk-tolerance culture can affect the quality of PPP-related aid decisions, I carried out a simple analysis based on observations of aid managers’ perceptions of risks and their mitigation strategies. Following is a summary of the findings of the analysis, as shown in Table 10 and Figure 12, in which perceived risks are grouped into four broad categories aligned with key aid incentives: political, economic, operational, and development
considerations.

Table 10. Risk Aversion in PPP-Related Aid Decisions

<table>
<thead>
<tr>
<th>Agent’s Goal</th>
<th>Risk Type</th>
<th>Perceived Likelihood</th>
<th>Perceived Impact</th>
<th>Mitigation Strategy</th>
<th>Risk-Transfer Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving aid objectives at minimal level of risk</td>
<td>Political</td>
<td>Low</td>
<td>High</td>
<td>Adopting single criteria: yes-or-no choice</td>
<td>Cross-verification</td>
</tr>
<tr>
<td></td>
<td>Economic</td>
<td>Low–medium</td>
<td>Medium–high</td>
<td>Outsourcing to professional firms or partnering with private sector</td>
<td>Management contract</td>
</tr>
<tr>
<td></td>
<td>Operational</td>
<td>High</td>
<td>Medium–low</td>
<td>Strengthening internal and external management</td>
<td>Monitoring &amp; evaluation, auditing</td>
</tr>
<tr>
<td></td>
<td>Development</td>
<td>High</td>
<td>Low</td>
<td>Hiring consultants</td>
<td>Service contract</td>
</tr>
</tbody>
</table>

- **Political risks.** The analysis revealed that when an aid manager evaluated a PPP proposal, he or she would first and foremost assess the political risks the project might involve. Because the consequences of political risks can be very high, aid managers tended to be very cautious and preferred using simplified rules to judge the political feasibility of the project. A strategy commonly observed was to verify that project stakeholders were sticking to the “one-China policy,” the political bottom line that China firmly practices throughout its foreign policy. However, this approach can lead one to overlook or underestimate important political considerations that could have an impact on the successful implementation of PPP, such as the political situation of the recipient country, or politicians’ interests, rather than the real needs that drive some PPP projects.

- **Economic risks.** In practice, the evaluation of economic risks is a more complex process and usually involves experts with advanced knowledge of economics and finance. And the possibility and potential impact of economic risks vary considerably among projects.
Depending on the methods used and the intentions of the partners, economic risks can be either overestimated, underestimated, or overshadowed by other risk considerations. For example, China’s leadership pledged to build one hundred hospitals in Africa. To fulfill this commitment, Chinese aid agencies might choose to downplay the economic risks of some of the projects. In other cases, the economic risks might be overrated due to bias against privately-owned firms, as compared to state-owned enterprises.

- **Operational risks.** Historically, operational risk was not a major concern in China-funded projects, largely because Chinese aid providers followed the problematic logic that once a project had been completed and handed-over, it was the responsibility of the recipient country to properly use and maintain it. In recent years, more emphasis has been attached to the operational sustainability of China-funded aid projects. However, lacking experience and skill in the assessment of complicated operational issues such as local management capacity and demand change, aid professionals may over- or underestimate operational risks. Over-reliance on management contracts and other risk-sharing tools can also lead to underestimation of operational risks, due to a false perception that operational risks will be covered by these contracts.

- **Development risks.** Development risk has received much less attention than it deserves, and its consequences are usually labeled “lessons learned” by development aid organizations, including those in China. Unlike the previous three types of risks, which are largely owned by aid agencies, the ownership of development risks, especially with PPP projects, was much more diffused among stakeholders—for example, aid-management bodies, the government of the recipient country, private-sector partners, and local implementing partners. In comparison to other types of risk, aid managers are more comfortable letting external consultants take care of the development risk. As a
result, development risk is likely to be seriously underscored, and “lessons” might never be learned as they should be in the planning and management of PPP projects.

Figure 13. Biases in Risk Management of PPP Projects
(arrows representing the direction of the effect of biases, e.g. tendency to underestimate political risks, and tendency to both over- and under-estimate economic risks)

Summary and Discussion

As was discussed in the previous section, aid managers were found to be frequently influenced by both noise and bias in their judgments on PPP projects. These issues can lead to inconsistency and inaccuracy in decisions, impairing the overall effectiveness of aid provision. More importantly, the cost is often hidden, as aid agencies and administrators are unaware of the problem and therefore fail to take corrective action to reduce the losses. Due to the existence of noise and bias, important decisions in PPP-related aid provision have often been left to informal and even “hidden” procedures, and to the intuition of aid managers. Without proper intervention, inconsistent and biased judgment can lead to inaccurate decision making,
which will reduce the effectiveness of PPP-related aid provision.

This also explains why regular capacity-development approaches, such as technical assistance, that emphasize the development aspects of projects by pouring more information into the project-management process, do little to increase the effectiveness of decisions. The fact that even experienced professionals are not immune to noise and bias raises questions about the very validity of knowledge-enriching, capacity-building activities. From an organizational perspective, efforts to strengthen the accountability framework of PPP-related aid projects, if they do not appropriately address noise and bias, will not provide adequate incentives for behavior change.

In summary, noise and bias co-exist in PPP-related decision-making, and if left unchecked will cause inconsistency and inaccuracy in decisions, resulting in unnecessary loss of effectiveness in aid provision.

3.1.4 Solutions and Deliverables

From the analysis in the previous sections, I conclude that to improve the effectiveness of aid decisions in PPP projects, what is lacking is not just information but a framework to help aid providers notice potential noise and bias in their decision-making processes, a set of clear rules for managing complexity and subjectivity, and user-friendly tools for integrating professional judgment to increase the accuracy and consistency of decisions.

The most radical solution might be to replace human judgment with algorithms. In the past few decades, multiple studies have shown that even simple and imperfect algorithms achieve greater accuracy and consistency than human professionals (Kahneman et al., 2018). With proper design, algorithms could be noise- and bias-free and more cost-effective. However,
algorithms are not always feasible in practice. In the case of PPP-related aid provision, given the fluid nature of aid decisions, which often involves a subtle balance of multiple interests and trade-offs between considerations, it is not feasible to rely completely on computers to make decisions, at least in the near future. That said, it is both possible and practical to assist aid professionals with a properly designed choice architecture or decision-support structure that will help them construct well-reasoned rules for deliberating on PPP-related aid decisions.

Thaler and Sunstein (2008) used the term “choice architecture” to describe a system that “has the responsibility for organizing the context in which people make decisions.” The purpose of applying choice architecture in the DELTA Project is to improve aid professionals’ decisions by carefully structuring how information is organized and options are presented. MCDA is a promising candidate for this. Among the range of multi-criteria analysis techniques that were designed for handling multiple conflicting criteria, MCDA has become popular among government officials and practitioners in many countries for appraising policy options (Multi-criteria analysis: A manual, 2009).

A PPP-related aid decision is a typical multi-criteria scenario. As was discussed in earlier sections, aid decisions are made in complex environments where multiple considerations—political, economic, and developmental—must enter the decision-making process. The choice of PPP modality further complicates the process with conflicting stakeholder interests, diverse financing and operational structures, and intertwining risk profiles. In many cases, important judgments have been made in a “quick and dirty” way without adequate reasoning and supporting systems. To solve this problem, the DELTA Project serves as a platform on which various methods can be explored to shed light on potential noise and bias in PPP-related decision-making, and the MCDA-based tool is introduced to control the level of subjectivity involved and bring more structure, analysis, and openness to the process.
MCDA as a PPP Decision Support Tool

Despite its increasing popularity in public and private domains in many countries, MCDA is still a new technique for Chinese government entities and aid professionals. In the DELTA Project, MCDA was presented as a practical tool for addressing certain concerns that aid managers have regarding PPPs, such as a lack of standard procedures for project appraisal, or the need to document the decision-making process for an audit trail.

To facilitate this process, a small workshop was organized with the participation of a group of aid professionals involved in PPP-project screening and appraisal activities. MCDA was introduced, and a discussion was organized around its main features, advantages, and limitations. A manual was provided containing detailed instructions on its application through a web-based software package named TransparentChoice. To illustrate the usefulness of MCDA in critical stages of PPP project management, an example was used to mimic the appraisal of a PPP-based hospital proposal seeking support from China’s South-South Cooperation Program. Instead of completing the full MCDA process, the illustration went through just eight core steps. Discussions were carried out in a participatory way to demonstrate the usefulness of the tool for increasing the effectiveness of PPP decision making, reducing human errors, and structuring reasoned choices. Following the demonstration, discussions were also organized on the possible integration of MCDA into the existing management package for PPP-related aid projects, which is being updated. A detailed description of the demonstration is included in Appendix 2.

The Role of MCDA in Improving PPP Decisions

The eight steps of MCDA-assisted demonstration basically imitated a decision-making

**** https://www.transparentchoice.com
process that systematically unpacks the complexity of a PPP-based health aid project. The participants identified the following advantages that MCDA has over informal judgment, and its potential to make PPP-related aid decisions more precise, reliable, and accurate:

- First, MCDA helps one divide a complex problem into parts that are easier to define and describe, and uses established techniques to set benchmarks to assist in decisions.

- Second, the process is open and explicit. The choice of alternatives and criteria is open to review and change. And the MCDA carried out in the project identification stage can also guide the later stages of project preparation and development.

- Third, MCDA mimics a competitive environment that does not necessarily exist in the appraisal of actual PPP projects, encouraging proactive consideration of the appropriateness of PPP as an option for aid provision.

- Fourth and more importantly, through iterative application MCDA provides opportunities for aid professionals to reflect on their own decision-making paths notice potential “traps,” such as noise and bias in individual judgment, and become more open to exchange and learning in a group setting.

- Fifth, MCDA is a social-technical process. It not only provides technical apparatus for decision-making, it constructs a social process in which all participants have the chance to articulate their views and the results are achieved through a consultative, consensus-making process.

- Last, MCDA documents the process of problem analysis and decision making, which helps produce records for audit trails and for future analysis and learning.
A detailed analysis of the functioning of MCDA as a decision-support tool to correct specific types of noise and bias in PPP decisions is given in Table 11.
<table>
<thead>
<tr>
<th>PPP Decision Problem</th>
<th>Explanations and Examples</th>
<th>Corrective Actions via MCDA</th>
<th>Decision Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Noise</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variability caused by multiple and potentially conflicting objectives.</td>
<td>The main objectives of a PPP-based friendship hospital project in Africa include greater political influence, improved health care services, and increasing market share for medical products.</td>
<td>Explicitly establish the decision context by articulating the aims of the project at the beginning, and identify criteria around the defined objectives.</td>
<td>Provide a structure for problem definition, and eliminate subjectivity in implicit reasoning.</td>
</tr>
<tr>
<td>Variability caused by the influence of multiple actors.</td>
<td>Chinese aid agencies, health authorities, constructions companies, pharmaceutical and medical device companies, government authorities of the recipient country, local health administrations, other health-aid partners.</td>
<td>Explicitly establish the decision context by identifying the decision makers and other key players.</td>
<td>Include considerations of incentives to manage potential conflicts.</td>
</tr>
<tr>
<td>Variability caused by the complexity of PPP projects.</td>
<td>Financing and ownership structures, local demands, risk profiles, economic viability, value-for-money, sustainability.</td>
<td>Deconstruct PPP projects by identifying, weighing, and pairwise-comparing multiple criteria to evaluate various aspects of the project.</td>
<td>Help aid professionals to improve their ability to map and select reasonable options.</td>
</tr>
<tr>
<td>Variability among individual decision makers.</td>
<td>Aid managers in the same role make different judgments about the same project.</td>
<td>Allow multiple evaluators to join the process, either as individuals or as group members, and make transparent decisions based on open discussions and feedback.</td>
<td>Collaborative filtering: using other people’s judgment to increase the accuracy and consistency of decisions.</td>
</tr>
</tbody>
</table>
Table 11 (Continued)

<table>
<thead>
<tr>
<th>PPP Decision Problem</th>
<th>Explanations and Examples</th>
<th>Corrective Actions via MCDA</th>
<th>Decision Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bias</strong></td>
<td><strong>Present Bias</strong></td>
<td><strong>Excessive Risk &amp; Loss Aversion</strong></td>
<td><strong>Group Think</strong></td>
</tr>
<tr>
<td></td>
<td>Overemphasis on the timely delivery of physical healthcare facilities or equipment other than sustainable healthcare services.</td>
<td>Explicitly include sustainability as a key criterion for evaluating the project, and assign appropriate weight to overcome the preset bias.</td>
<td>Senior professionals, officials, and experts usually dominate the evaluation process. Every evaluator is given equal (or weighted if necessary) opportunity to make independent, informed decisions and provide feedback.</td>
</tr>
<tr>
<td></td>
<td><strong>Excessive Risk &amp; Loss Aversion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overestimating certain types of risks and losses, e.g. political and economic risks; underestimating demand risks and operational risks.</td>
<td>The overall risk profile can be evaluated as one criterion and supplemented by other types of monetary-based analysis, such as cost-effectiveness and cost-benefit analysis. An alternative is to list all the key risk factors as separate criteria to evaluate.</td>
<td>Being open and explicit about potential loss, legitimizing reasonable risk mitigation, and cross-reference to other source of information.</td>
</tr>
<tr>
<td></td>
<td><strong>Group Think</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Senior professionals, officials, and experts usually dominate the evaluation process.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Confirmation Bias</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Operational Tools and Methods for Effective PPP Management

MCDA-related efforts have primarily focused on understanding and correcting the noise and bias that reduce effectiveness in PPP decisions. But the knowledge gap exists even apart from the behavioral problems, and it is felt more acutely by Chinese aid managers. Aid practitioners of the South-South collaboration project management unit struggled with their lack of project management skills for dealing with increasing PPP cases.

To help fill the gap, a set of deliverables was developed to facilitate their learning to handle PPPs in China’s development cooperation. Based on international experience and the best available practices, these deliverables focused on distilling key global PPP experience and lessons for development, with the aim of establishing the basics of a PPP management framework for the development of operational frameworks and management tools for South-South cooperation. More importantly, the operational interventions and MCDA are not stand-alone pieces. MCDA has built-in interfaces for integration with other management support tools, such as cost-effectiveness analysis and cost-benefit analysis, so it is included in the procedures suggested for PPP project management.

Based on the requirements of the host organizations, the following deliverables were developed by January 2018 (slides summarizing the main contents of the other deliverables are in Appendix 3):

- A report on the strategic application of the PPPs in South-South cooperation (delivered to the South-South project management unit in October 2018).

- A guideline including key framework and operational tools to support the strategic management of PPPs (outline and some parts delivered to the South-South project management unit, full package to be completed in May 2018).
• A brief note on using MCDA to augment project identification and appraisal under South-South programs (delivered to the South-South project management unit in November 2018; additional capacity-development component in development).

• An analytical note on increasing the sustainability of China’s foreign-aid-funded hospitals through the engagement of private-sector partners (delivered to NHFPC in December 2018).

• A full proposal on strengthening health collaboration between China and Africa, supported by China World-Bank Partnership Framework, with PPP included as a key approach to collaboration (delivered to the WBG in November 2018).

3.1.5 Impact on Host Organization and Stakeholders

Policy and Strategy

Through empirical analysis, the DELTA Project confirmed that Chinese aid policy is shifting toward a hybrid paradigm driven by multiple interests of the states, with the economic dimension being underscored together with political and development considerations in shaping global balances. As China plays an increasingly important role in global development cooperation, it is imperative for its aid policy-makers to continue using the PPP model to leverage new opportunities, unlock higher strategic potentials, and manage risks and challenges that could hamper the effectiveness of aid.

For policy makers, a key issue around PPP is to make the model fit into China’s evolving aid programs and contribute effectively to development cooperation targets. The DELTA Project helped advance this agenda by (i) anchoring PPP as an important approach to international collaboration, for instance between China and the World Bank Group, (ii)
broadening access to global policies and strategies on the use of PPP for development cooperation, and (iii) providing evidence-based recommendations on the development of policy and regulatory frameworks to support the application of PPPs in China’s South-South cooperation.

In the same spirit, key findings and recommendations for improving PPP-related management and operations were presented to senior members of host and stakeholder organizations. The policy impact was witnessed by a $600,000 USD program approved by the World Bank Group to support China-Africa health collaboration, which endorses PPP as a main approach to collaboration. With the support of the China-World Bank Partnership Facility, this program will be implemented through 2019 and will include a collaborative research agenda on innovative partnerships and co-financing mechanisms such as PPPs. At Chinese counterpart agencies, PPP policy notes and related studies attracted the attention of leaders of concerned aid programs, who expressed interest in extending the relevant PPP studies and capacity-development initiatives into a second phase.

Management and Operation

The target of the DELTA Project is to improve the effectiveness of PPP-related decisions. The project hit its target via two complementary approaches. Conceptually, the project helped redefine the PPP for South-South Cooperation (SSPPP), clarifying the features that distinguish it from traditional PPPs and the implications for management practices. Operationally, the project facilitated learning from the best practices worldwide. Specific guidelines, tools, references, and templates were shared and adapted to bridge knowledge gaps in PPP management and operations.

In conjunction with the DELTA Project, a proposal is being developed to enhance the
capacity of aid practitioners to manage PPP-related businesses. As the South-South Cooperation Fund plans to update its internal operational manual in 2018, the deliverables of DELTA project and its follow-up initiatives offered important technical input to the improvement of PPP-related components in the manual. And the integrated conceptual-operational approach to knowledge translation will ensure a lasting impact on the PPP-management practices in broader South-South cooperation activities funded by China in the near future.

Organizational Behaviors

The DELTA Project fills in the gap by raising awareness that information alone cannot solve the problems in PPP-related aid provision, and that how information is organized and how human judgment is processed matter to effective decision-making.

Drawing on theories and evidence from behavioral science, analyses were undertaken to frame the main cognitive and behavioral pitfalls in PPP decision-making. Few researchers have approached the issue from this perspective. Building on the analysis, a computer-based decision-support tool was introduced to assist decision making under risk and with conflicting interests. This work was conducted as an integral part of a capacity assessment of the South-South collaboration program, so there is a good chance the findings and recommendations will be incorporated into the design of the future capacity-development package of the program. The MCDA tool and the principles and values that it embodies will have a positive impact on the organizational behaviors of Chinese aid agencies and move them toward more open, transparent, and participatory decision-making, and will contribute to overall aid effectiveness by saving the costs of less effective capacity-building and informational interventions.
3.2 Reflections

3.2.1 Analytical Frameworks and Theory of Change

The problem and rationale that motivated the DELTA Project remain unchanged in retrospect. The project’s three premises were largely proved valid in the execution of the project. And the results of the project further confirm that it is not only relevant but feasible to strengthen the strategic management of PPP through the methods and approaches proposed in the project.

Guided by the conceptual roadmap described in the theory of change, the DELTA Project emphasized two essential aspects of PPP-related aid provision: decision making and operational effectiveness. Following a literature review that confirmed the extent of the related issues, empirical studies and analysis were used to gain in-depth knowledge of various aspects of the problem, and a targeted intervention strategy was undertaken to explore solutions. From the problem statement to the choice of strategies and interventions, the DELTA Project was executed on the basis of the underlying theory of change, with enrichment based on the analysis of behavioral aspects of decision making, which turned out to be a critical truth-finding process and reinforced the rationale of the intervention strategy.

3.2.2 Organizational Context, Barriers, and Response

As the host organization of the DELTA Project, the World Bank Group (WBG) offered a favorable organizational environment. Two conditions constitute the “policy window” in which the project was situated. The first was the development of the China-World Bank partnership, which prioritizes South-South cooperation in health and other social sectors and provides competitive grants to initiatives aligned with this goal. In 2017, the WBG unveiled new “cascade” principles that emphasize the leveraging of private resources to meet the requirements for sustainable
development goals (WBG, 2017). The call to scale up private finance opened the window to deepening PPPs, which further underscored the relevance of the DELTA Project to the organization.

However, with a large international organization like the WBG, it takes time for ideas to be translated into policies and actions, and lengthy bureaucratic processes sometimes resulted in missed opportunities for advancing the collaboration with China. To overcome this barrier, the DELTA Project prioritized the development of a new platform dedicated to strengthening South-South cooperation between China and Africa in the health sector, and secured funding from the China-World Bank Partnership Facility to support targeted research and capacity-building initiatives. In China, as designated aid team is keen to address the concerns in PPP program management, stakeholders are highly supportive and actively engaged in the DELTA project towards producing satisfactory deliverables.

**3.2.3 Contribution to Broader Learning in Public Health**

At the policy level, the project enhanced our understanding of the motivations, patterns, and trends of China’s overseas development cooperation in the health sector, providing evidence and a basis for Chinese aid agencies to develop strategies for working with private-sector partners on better quality and effectiveness in health aid programs. At the operational level, the project helped in the construction of decision-support architecture designed to help aid professionals overcome bias and make better PPP decisions.

Many of these considerations—for example, accessibility, sustainability, and quality of service—are crucial for the success of public health initiatives in the field. In addition, the behavioral interventions also created critical interfaces for systematically incorporating technical and informational inputs into aid decisions. For health sector PPPs, the approach would assure
a more inclusive, evidence-based decision mechanism in which knowledge about local health systems and expert input on recipients’ health needs could interact with other economic and social considerations of PPP projects in a systematic way. By achieving this, the DELTA Project has helped to improve the effectiveness of China’s health aid decisions and indirectly contributed to the promotion of public health in countries receiving aid.

3.2.4 Limitation and Discussion

Focus of the Study, and Other Aspects of Aid Effectiveness

The DELTA Project focused foremost on the quality of aid provision, which is only one aspect of PPP-related development cooperation. Quality of aid and coordination among aid providers are equally important in the overall effectiveness of aid, and both will interact with aid provision to some extent. These are important topics but are not covered by the DELTA Project due to its limited timeframe and budget. Likewise, the project prioritized decision-making and operational effectiveness, but other important aspects of aid provision were not extensively discussed, such as country selectivity, recipient participation, country ownership, and broader result-based aid management that focuses on the outcome and impact of aid. Although these issues were beyond the scope of the DELTA Project, they all matter in one way or another to the overall effectiveness of PPP-related aid.

Quality of Data

The project mainly used secondary data that were available from public websites, publications, and journal papers. The datasets used to analyze China’s development finance were constructed using a media-based approach, which inherits the strengths and limitations of the methodologies. Missing information, under-reporting, and over-estimation may affect the
analytical power and generalizability of the conclusions. While the behavioral part of the analysis was based on first-hand information gathered from observations and surveys, these data were qualitative in nature and limited to a small sample, which also affects the generalizability of the findings. The lack of sub-national and project-level details further affects the study’s ability to draw conclusions from more accurate and contextual observations.

**Applicability of DELTA Intervention in Broader Context**

The DELTA Project is designed to address challenges that are specific to China’s South-South cooperation program at its current stage. While methods like MCDA are generally applicable to broader development and organizational contexts, they must be adapted to the specific organizational and programmatic situation to be helpful. For example, the project-identification process of health departments will be substantively different from that of foreign aid departments, even for similar health aid programs. Likewise, China’s aid system will continue evolving, and its management practices will change accordingly. A good solution therefore cannot stay static but must be modified constantly to keep abreast of the changing requirements.

**Timeframe**

This project was implemented over an eight-month period from June 2017 to January 2018. For a project that aims at improving operational practices and decision patterns, eight months was too little time to observe sustained change. The adaptation and development of instruments, follow-up assessment, targeted capacity building, and further awareness raising and information sharing must be undertaken in an iterative mode to make the change last. That said, the DELTA Project served as a starting point, laying a good foundation and paving the way for efforts far beyond its own timeframe.
3.2.5 Future Topics of Investigations and Interventions

To improve the effectiveness of PPP in China’s development cooperation, more empirical research is needed to clarify the aid allocation and impact of PPPs in China’s overseas development collaboration. Ideally, more comprehensive and reliable datasets will be constructed with detailed information at the project level so that systematic comparisons can be made among program designs, implementation modalities, ownership strategies, divisions of responsibility, and risk-sharing mechanisms. In the meantime, it is worth revisiting the concept of “untying aid” by assessing the effectiveness and impact of PPPs that not limited to Chinese companies.

Further attention will be paid to China’s positioning as a global health aid provider, and to its interaction with other donors and global health PPP mechanisms, such as global funds and GAVI. For aid policy makers, cross-sectoral analysis of the incentives and business models of private partners engaging in development activities would also offer insights into the appropriateness of and conditions for applying PPP in development cooperation.

In addition, because aid professionals’ decisions can have a large impact on many people, it is essential to conduct more studies of how social, environmental, and cognitive factors affect complex aid decisions, and what mechanisms could increase awareness of “mental traps.” In practice, thematic action research is needed to improve the integration of decision-support tools like MCDA in policy and project management processes—for example, linking the choice of criteria and sub-criteria in project appraisal with broader result-based management frameworks.
PART IV. CONCLUSION

Background

The DELTA project was designed and implemented in the changing landscape of global aid. In May 2017, China’s President Xi Jinping pledged $124 billion to support the Belt and Road Initiative, reassuring the tone for so-called Globalization 2.0 (BBC, 2017). Undoubtedly, China still lags far behind the U.S. and other major donors in the scale of aid. However, its development cooperation is evolving toward a model distinct from that of its Western counterparts, one with a blurry line between aid, investment, and trade. In alignment with this paradigm shift, public-private partnerships have become an increasingly feasible option for China’s development cooperation program, not only in infrastructure projects but in social-sector support like health aid. The momentum and evolution of this feature of Chinese aid sparked my interest in making of DELTA Project. Questions were raised about issues and challenges that Chinese aid system faces in applying PPP in global development cooperation, and about measures to improve the process for more effective aid and better results of cooperation.

The DELTA Project

Inspired by these questions, I took stock of interdisciplinary literature on the strategic motivations behind foreign aid and on the incentives and practices for using PPP in development cooperation, especially in the health sector. I also drew on findings from recent behavioral studies to capture the nuances of organizational and individual behaviors that affect decision-making patterns. On the basis of my findings, I established a theory of change with a focus on the effectiveness of PPP-related aid from the perspective of aid provision, assuming that improvements in the quality of PPP-related decisions and practices would contribute to the
overall effectiveness of Chinese development cooperation. Guided by the theory of change, I designed an intervention strategy incorporating four key steps: restructuring the problem, assembling evidence, and introducing and applying proposed solutions.

The DELTA project was thus designed to improve Chinese aid effectiveness by strengthening the strategic management of public-private partnerships. Under this overarching goal, there were two specific objectives: bringing greater structure, analysis, and openness to the PPP decision-making process, and increasing the efficiency of PPP arrangements by introducing and adapting international experience. The World Bank Group served as the main host organization for the project, with the South-South Cooperation Fund project management office and the Chinese National Health and Family Planning Commission being the two main stakeholders in the project. The strengthened partnership between the World Bank and China in global development cooperation provided an ideal platform for the project’s implementation.

Key Findings

Guided by the theory of change and the intervention strategy, the DELTA Project was implemented from June 2017 to January 2018, with analytical research, application of intervention, and production of deliverables intertwined during the period, each taking nearly a third of the total time. The analysis part was based on an empirical study of China’s development finance to Africa, which revealed that China’s overall global development finance to Africa had increased in both scale and frequency from 2000 to 2013. Health was the second most frequently invested sector in Africa, after industry and infrastructure but before all social sectors. On average, China provided about $480 million USD to finance around 40 health projects each year. Its health finance portfolio also became more diversified over time. Although deploying medical teams to support general medical services in African countries remains an
important part of Chinese health aid, its interests have been steadily growing in health-facility building and the provision of medical equipment and drugs, indicating the engagement of the Chinese private sector in the process.

This study further showed that China's development finance in Africa was relatively concentrated geographically. The top ten countries absorbed nearly 90% of the total funding in the health sector. On average, projects tend to have mixed funding and partnership structures and decreasing levels of concessionality and state involvement. Further regression analysis suggested that political, diplomatic, economic, and development considerations are likely to be factored into the allocation of Chinese development aid resource, albeit in a less systematic and predictable way.

In addition to the above empirical evidence, observations were drawn from the analysis of how PPP-related decisions are made. It is clear that contextual changes justified the use of PPPs as a response to emerging strategic, technical, and operational demands in organizing and delivering development aid. Nevertheless, the multiplicity of aid objectives, the complexity of PPP models, and other management issues (e.g. principal-agent relationships), jointly lead to inconsistency or “noise” in PPP-related decision making. The analysis further found that professional judgment of PPP is not only noisy but biased. Common types of error include present bias, groupthink, confirmation bias, and excessive risk aversion. These issues may bias PPP-related decisions toward over- or underestimating certain factors, causing inaccuracy in judgments on the potential performance of PPPs.

The above findings further explain why technical and informational interventions, such as technical assistance that emphasizes the development aspects of projects, had little impact in improving the effectiveness of decisions. Likewise, the regular capacity-development approach
aiming at improving the professional knowledge of personnel may help addressing the inconsistency issue but does little to change the bias.

**Solution**

Based on these findings and analyses, I conclude that to improve the effectiveness of aid decisions in PPP projects, what is lacking is not just information, but a process for helping aid providers notice potential noise and bias in decision making, a set of clearly articulated rules for systematically managing complexity and subjectivity, and a user-friendly tool for integrating professional judgment towards a higher level of accuracy and consistency in PPP decisions.

To this end, the multi-criteria decision analysis technique was introduced to construct the solution. To illustrate the functioning of MCDA as a decision-support tool, an example was used to mimic the project appraisal process of a PPP-based health aid project. Using an internet-based application, the demonstration went through the eight main steps of MCDA-assisted decision making: establishing the decision context, identification of options, objectives, and criteria, weighting and scoring of criteria, and producing a consensus-based result.

Through the process and follow-up discussions, the demonstration presented the target audience with the potential value of the MCDA tool for organizing information for complex decisions and for controlling subjectivity by bringing structure, analysis, and openness into the decision-making process. By doing this, MCDA reduces human errors and structures reasoned PPP choices, contributing to the improvement of decision-making. More importantly, MCDA is not a stand-alone tool. It has built-in interfaces for inputs from other tools and methods, and hence could be incorporated as an integral part of the PPP-management package.

In addition, a series of other deliverables were developed to fill in the knowledge and
management gaps, facilitate learning from international experience and practices, and enrich operational frameworks for the strategic management of PPPs in China’s South-South cooperation.

**Impact**

The DELTA project helped identify gaps and challenges in the application of PPP to the achievement of China’s strategic goals of development cooperation. The project made a policy impact by anchoring PPP as an important model for South-South cooperation, and leveraged concrete support from the host organization to support the initiative. From a management perspective, the project provided critical input to the optimization of PPP-related decision-making and management practices, thus contributing to the overall efficiency of work. Finally, the MCDA tool, together with the principles and values it embodies, influenced the organizational behavior of Chinese aid agencies toward more open, transparent, and participatory decision making, which will contribute to the overall effectiveness of Chinese development cooperation globally.

**Main Takeaways**

The primary takeaway of this project is that PPP as a partnership modality has the potential to provide viable and practical solutions in the delivery of China’s development aid overseas. It could be valuable for addressing certain intractable challenges in China’s development cooperation as well, such as improving the efficiency and sustainability of health aid. However, the nature of PPPs makes this a highly complex process involving deliberative trade-offs of interests. Hence, for a health PPP project to succeed, and even for decisions to be made about when and when *not* to use the modality, the context for the decision needs to be well-established in the project identification phase, when objectives must be clearly defined, and
respective criteria to assess the achievement of each must be carefully constructed to judge the value of PPP interventions.

The second takeaway is about using a decision-support tool that integrates operational, technical, and informational interventions to make PPP management more effective. The study shows that inconsistency and inaccuracy exist and hurt the effectiveness of PPP as a hidden cost, and that single, separate interventions often fail to address the issues. It is time for aid agencies to confront this problem, apply behavioral interventions in their management responses, and consider constructing decision-support architectures to help aid professionals correct some of the behavioral errors in human judgment. As an integral part of the operational structure, the architecture also offers a platform for synthesizing technical and informational inputs, and helps us create more open, transparent, and participatory environments for decision making.

The third takeaway is about managing change spaces. The pre-DELTA version of the project was a typical technical request to develop operational guidelines, manuals, and procedures to help the Chinese aid program deal with risks and uncertainties around public-private partnerships. Eight months later, the requesting agency got what it asked for, and with a bonus: an MCDA-based decision-support tool embedded as an integral part of the solution. More importantly, the solution is adaptable by nature and facilitates a learning journey toward transformational changes in PPP management in China’s development cooperation. The change space did not exist or seemed limited in the beginning. But when opportunity emerged and the three As of acceptance, authority, and ability converged, it sent a signal for actions to be taken to expand or create the change space. The DELTA Project hence provided an example for managing change space and initiating an iterative journey of adaptation required by the transition.
Beyond DELTA

In many development organizations, specialists and managers work in silos, burying themselves in tons of information while creating numerous rules and procedures for solving problems. The DELTA Project does not intend to undermine the importance of specialized knowledge and procedures. On the contrary, it underscores the value of information, provided that it is organized in such a way as to produce good results. To this end, more work needs to be done to understand decision-making structures in aid provision and their impact, particularly for complex scenarios like PPPs.

While the DELTA project emphasizes the value of MCDA for assessing the applicability of PPPs in global health aid, especially from an ex ante perspective, the project did not elaborate on how to ensure desirable results under such a modality. Despite plenty of literature debating the goods and bads of PPPs in the health sector, very few researchers have focused on PPPs in China’s health aid system, mainly due to the lack of data, especially outcome information at the project level. With more China-financed health PPPs being undertaken, evaluations of these projects could provide empirical evidence on whether PPP offers the value it was designed for. The feedback could also be used to check the validity of the MCDA setup, and make future PPP-related decision models more effective and sound.

Considering the existing approaches to health care financing and delivery in development countries, the PPP-based health aid will in one way or another intersect with already-very-complex health systems. Whether PPPs will suffice for the overlapping demands of aid providers, private partners, and recipient countries therefore remains a question to be observed, analyzed, discussed, and answered through future research and practices.


847–868.


APPENDICES

Appendix 1. Regression Analysis: Possible Determinants of Chinese Development Finance to Africa

On the basis of the descriptive analysis, it is the interest of the DELTA Project to probe the key factors that may affect the decisions on the distribution and patterns of Chinese aid to Africa. To this end, time series data of 43 African countries (those recorded as recipient countries in the AidData) was retrieved from the World Bank Databank, with indicators covering recipient country’s development context, governance and institutional quality, economic, trade and investment context, as well as aid related information. A new database therefore was constructed combing the development data with key outputs of the AidData, i.e. aggregated data of Chinese development finance to Africa by country, forming a new panel data covering the period of 2000-2012. Regression analysis was then conducted with only completed projects included in the model.

All Projects - Simple Regression Analysis

Simple linear regression analysis shows that a country’s population, the level of its bilateral trade with China, and the total amount of ODA that the country received from DAC donors are partially associated with the total amount of development financing that country received from China. (Figure a1-14)

![Correlations between China's Development Finance and Independent Variables – All Projects](image-url)

Figure a1-14. Correlations between China’s Development Finance and Independent Variables – All Projects
All Projects - Multiple Regression Analysis

Based on existing theories about the motivation of aid, and building on the results of simple linear regression analysis, we also constructed multiple regression models using panel data with population size, GNI per capita and level of bilateral trade (export and imports) included in the model. The result indicates that when controlled for GNI per capita, population and level of trade are predictive to China’s development financing level (p=0.001 for both, adjusted R-square=0.4820). Considering the possible role of fuel exports in China’s aid allocation as indicated by some literature, level of bilateral trade is replaced by the level of fuel exports of a country in the second model, with the result showing that only population remains significantly associated with the amount of development financing that the country received from China. The third model is constructed based on the first model with the level of ODA from DAC donors further included. The results suggest that after adjusting for population and GNI per capita, China’s development finance to an African country can be partially predicted by the country’s bilateral trade level with China and the level of ODA that the country receives from DAC countries.
Table a1-12. Results of Regression Analysis – All Projects

Dependent Variable = Average level of development funding from China 2000-2013 (US$ million)

<table>
<thead>
<tr>
<th>Population (mil)</th>
<th>Export &amp; Import</th>
<th>GNI per capita</th>
<th>Fuel Export</th>
<th>DAC Aid (mil)</th>
<th>Obs.</th>
<th>Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.40*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td>0.4485</td>
</tr>
<tr>
<td>0.009*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td>0.3435</td>
</tr>
</tbody>
</table>

Simple Regression

-0.001 (0.769)

1.148*** (0.002)

0.087 (0.000)

Multiple Regression Model 1

1.08*** (0.000)

0.006*** (0.000) -0.001 (0.665) - -

47 0.5766

Multiple Regression Model 2

1.08*** (0.001)

- 0.002 (0.283) -0.526* (0.066) -

36 0.5401

Multiple Regression Model 3

-0.004 (0.991)

0.006*** (0.000) -0.001 (0.398)

0.079*** (0.000)

42 0.7355
Health Projects - Simple Regression Analysis

For the health sector, given the large number of missing values in the total amount of health financing, number of health project is used as a proxy to indicate the level of Chinese health development financing. Simple linear regression analysis suggests that the number of reported malaria cases and number of physicians per 1,000 people are predictive to the average number of health projects China financed in a country, suggesting possible consideration of recipient needs in the decision of China’s health finance. Multiple regression analysis further confirms that reported malaria case number and number of physicians were most significantly associated with the number of health aid project that China financed in Africa. (Figure a1-15)

Figure a1-15. Correlations between China’s Development Finance and Independent Variables – Health Projects
<table>
<thead>
<tr>
<th>GNI per capita</th>
<th>MMR</th>
<th>M-5b</th>
<th>LE</th>
<th>Malaria Case nr.</th>
<th>Hospital bed</th>
<th>Physician nr.</th>
<th>Obs</th>
<th>Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.001**</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>46</td>
<td>0.1067</td>
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<tr>
<td>(0.015)</td>
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<td></td>
</tr>
<tr>
<td>0.002 (0.368)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47</td>
<td>-0.0039</td>
</tr>
<tr>
<td>0.041* (0.097)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47</td>
<td>0.0544</td>
</tr>
<tr>
<td>Simple Regression</td>
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<td></td>
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</tr>
<tr>
<td>-0.268* (0.063)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47</td>
<td>-0.007</td>
</tr>
<tr>
<td>0.007*** (0.002)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38</td>
<td>0.2130</td>
</tr>
<tr>
<td>-1.91* (0.091)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>46</td>
<td>0.0422</td>
</tr>
<tr>
<td>-9.59*** (0.005)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>47</td>
<td>0.1414</td>
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<tr>
<td>Multiple Regression Model 4</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>38</td>
<td>0.2233</td>
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<tr>
<td>0.006** (0.012)</td>
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<td></td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Regression Model 5</td>
<td>0.001 (0.540)</td>
<td></td>
<td></td>
<td>31.48 (0.168)</td>
<td>-</td>
<td>-14.15 (0.141)</td>
<td>37</td>
<td>0.2059</td>
</tr>
<tr>
<td>Multiple Regression Model 6</td>
<td>0.001 (0.545)</td>
<td></td>
<td></td>
<td>0.013 (0.950)</td>
<td>0.0056** (0.025)</td>
<td>-14.40 (0.171)</td>
<td>37</td>
<td>0.1812</td>
</tr>
</tbody>
</table>
Panel Data Analysis

The above cross-sectional data focused exclusively on the “between variation” by using averages of outcome and dependent variables. Furthermore, it is reasonable to believe that variation of Chinese development finance may be caused by differences across countries, for example, the physical distances between a recipient country and China. Considering the potential issue of omitted variables, we also tried to use fixed effects model to control for all time-invariant differences between the countries. Hausman test was further conducted to confirm that the preferred model is fixed effect versus the alternative random effects (Prob>chi2 = 0.0278, which is <0.05). The results of the fixed effects models suggest that after adjusting for GNI per capita, a country’s population together with its bilateral trade with China significantly explain China’s development finance amount over the years. And DAC member’s aid may also have some explanatory power in predicting China’s development finance.

Table a1-14. Results of Panel Data Analysis – All Projects

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Export &amp; Import</th>
<th>GNI per capita</th>
<th>Fuel Export</th>
<th>DAC Aid</th>
<th>Obs./Groups</th>
<th>R-sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effect Model 1</td>
<td>23.55***</td>
<td>50.14***</td>
<td>-0.008</td>
<td>-</td>
<td>-</td>
<td>541/47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.000)</td>
<td>(0.615)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Effect Model 2</td>
<td>42.99***</td>
<td>-</td>
<td>0.036</td>
<td>4.41</td>
<td>-</td>
<td>320/40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>-</td>
<td>(0.159)</td>
<td>(0.114)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Effect Model 3</td>
<td>20.31**</td>
<td>50.64***</td>
<td>-0.009</td>
<td>0.088**</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.000)</td>
<td>(0.571)</td>
<td>(0.040)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fixed effect models, however, did not tell much about the relationship between the total number of health projects and variables indicating health needs, e.g. malaria cases, number of physicians. There is evidence that country’s income level and life expectancy at birth might have some influence in the decisions on the number of health project financed by China.
Table a1-15 Results of Panel Data Analysis – Health Projects

Dependent Variable = total number of China-financed projects in health sector

<table>
<thead>
<tr>
<th></th>
<th>GNI per capita</th>
<th>LE</th>
<th>Malaria Case nr.</th>
<th>Physician nr.</th>
<th>Obs/Groups</th>
<th>R-sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-4.59e-08</td>
<td></td>
<td>0.553 (0.628)</td>
<td></td>
<td>102/36</td>
<td>within = 0.0042</td>
</tr>
<tr>
<td></td>
<td>(0.628)</td>
<td></td>
<td>(0.873)</td>
<td></td>
<td></td>
<td>between = 0.0543</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>overall = 0.0161</td>
</tr>
<tr>
<td>Fixed Effect</td>
<td>0.0007**</td>
<td></td>
<td>-7.36e-09</td>
<td>-0.052</td>
<td>101/36</td>
<td></td>
</tr>
<tr>
<td>Model 5</td>
<td>(0.040)</td>
<td></td>
<td>(0.938)</td>
<td>(0.988)</td>
<td></td>
<td>within = 0.0703</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>between = 0.0351</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>overall = 0.0045</td>
</tr>
<tr>
<td>Fixed Effect</td>
<td>0.00001</td>
<td>0.258***</td>
<td>3.52e-08</td>
<td>-0.3418833</td>
<td>101/36</td>
<td></td>
</tr>
<tr>
<td>Model 6</td>
<td>(0.974)</td>
<td>(0.000)</td>
<td>(0.677)</td>
<td>(0.911)</td>
<td></td>
<td>within = 0.2819</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>between = 0.0286</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>overall = 0.0002</td>
</tr>
</tbody>
</table>

In addition to above-mentioned fixed effect models, models including only completed projects were also tested but no significant relationship was found for all project models. And for health project models, only life expectancy remains significant in model 6. However, considering that the purpose of the analysis is to understand the motivations behind Chinese development finance, it makes sense to have both pipeline projects and projects in implementation included into the analysis to reflect the whole picture of motivations, even though some have not yet been realized.

In summary, the above analysis indicates that multiple considerations interact to play a role in China’s development aid decisions. Recipient country’s population size, GNI per capita, bilateral trade with China, together with the country’s political stance are likely to be partially or collectively considered in the allocation of aid resources, reflecting complex motivations behind aid provision driven by political, economic and diplomatic interests. The findings further confirm that China’s aid allocation is independent of governance and institutional quality of recipient countries. And except for population size and income level, it is not clear how recipient country’s development needs e.g. poverty level are counted in the allocation of China’s development finance. It might be the case that specific development needs are factored more at sector level, as shown in health sector analysis. Additionally, when making their own allocation decisions, Chinese aid officials may as well use DAC aid level as benchmarks to avoid excessive political or economic risks.
Appendix 2. Demonstration: Applying MCDA in PPP Proposal Appraisal

In recent years, the Government of China pledged to increase health assistance to developing countries, promising to build more than 100 hospitals and health facilities in Africa. Unlike other types of infrastructure projects that China financed through credits from its development banks, most of the funding for hospital construction was funded by China Aid program managed by the Ministry of Commerce (MOFCOM). As more hospitals are being constructed, MOFCOM becomes concerned about sustainable operations of the hospitals and quality of services delivered, hence considers PPP as a potential model for future hospital projects to address the issues.

To demonstrate the value of MCDA in improving the quality of PPP-related aid decisions, I developed a case where the South-South Cooperation Fund receives a proposal seeking funding support for a new friendship hospital planned to be built in the capital city of country X in West Africa. In the case, the proposal was submitted by a Chinese health aid agency in partnerships with leading Chinese medical product manufacturers. With an initial investment plan of $8 million, the applicants seek complementary funding support, e.g. another US$ 3 million from the South-South fund, aiming to establish a Public Private Partnerships to jointly built and operate the hospital. The proposal has a timeframe of five years and is committed to providing quality health care and public health services to local communities during and beyond the period.

As an established procedure, the fund requires that for any proposal to be selected into the next phase of full-fledged project development and assessment, it needs to pass the preliminary screening. The screening phase is hence an important step and involved critical decisions that determine whether the project can and should be delivered in the way that it plans to be. A group discussion was then organized to mimic the preliminary screening process that the management office of the South-South Cooperation Fund activates upon receiving such a proposal i.e. the case. A group of 12 fund management officers, division leads and advisers attended the discussion, where they jointly undertook preliminary appraisal on the case.

Unlike regular appraisal meetings, which usually involved unstructured group discussions based on qualitative assessments on various aspects of the proposal, MDCA was applied in this case as an auxiliary tool to assist the screening process. I facilitated the discussion and used an online MCDA software package to illustrate the eight main steps of the MCDA-assisted decision-making approach.

Following is a record of the process that the group jointly went through in the demonstration exercise:

**Step 1: Establishing the decision context**

In the first step, participants were asked to answer the following questions and achieve consensus on their answers. The answers were then recorded using the dialog box of the online software (Figure a2-16):

- What goals to be achieved by doing the project?
- Who are the key players driven by what incentives?
- How is the broad political, economic, social and technological environment (PEST) in which the project will be conducted?
- What are the major strength, weaknesses, opportunities, and threats (SWOT) for the project to achieve its goal?

It took some time for the participants to agree on their answers. The dialogue therefore helped creating a shared understanding about the issue that the proposal was meant to address and generating the common purposes for the follow-up discussions. Through the discussion, the participants further found that not all the information that they were interested to know was explicitly written in the proposal. They raised important questions that either need to be answered in the later steps of the appraisal or to be further analyzed as follow-up actions. The process hence facilitated the joint review of the contextual information, identified potential gaps of, as well as sources for additional knowledge.

![Create new project](Image)

* Name of your project:
  Friendship Hospital X
  * It should be between 2 and 100 characters.

* Goal of your decision:
  * To choose between multiple proposals or to compare PPP with other models
  * Between 2 and 100 characters.

Description (optional):

You can provide a longer description of your project.

![Create new project](Image)

Figure a2-16. MCDA Step 1- Establishing Decision Context
**Step 2: Identify options to be appraised**

In the second step, participants were asked to identify at least two potential options, which will be compared with the current proposal as an existing option for the solution. Other options can be pre-specified, for example, similar proposals competing for funding support. Or, like in this case, options can be formulated as alternatives to the proposed PPP project, i.e. a hospital fully funded by private sector investment, or “doing nothing”, i.e. maintaining the status quo of public financing and provision of healthcare services. (Figure a2-17)

![Figure a2-17. MCDA Step 2- Identify Options](image)

**Step 3: Identify objectives and criteria**

Criteria are specific, measurable objectives that are used to assess the potential performance of each option identified in the previous step. Deciding which criteria to be included in MCDA model is a matter of judgment. In the demonstration, practical approach was adopted by going back to the goals that are to be achieved. The objectives of the Hospital X proposal were identified by the group as follows:

- To strengthen **strategic relationship** between China and Country X, and considering incorporating future Chinese health aid with services provided by the hospital;
- To promote population health in the country by providing **sustainable**, **quality** health care services;
• To ensure that services provided are demand-driven and at reasonable cost and risk levels.

Based on these objectives, respective criteria were developed by the group such as strategic fit, risk management, commercial factors (demand-driven), sustainability, and quality (Figure a2-18). For the purpose of demonstration, the exercise used simplified examples of criteria. Meanwhile, participants further noted that these indicators will need to be measured by designated studies employing both quantitative and qualitative methods, or supported by available information from other monetary valuation and numerical assessments. In real appraisal, criteria can also be further broken down into sub-criteria, e.g. access and effective coverage of services under the criterion quality, and affordability under sustainability to ensure that the project will bring benefits for the poorer segment of the population instead of widening the gap in equal access to health service.

![Figure a2-18. MCDA Step 3- Identify Objectives and Criteria](image)

**Step 4: Weighting – assign weights for each of the criteria**

The purpose of the step is to reflect the relative importance of each criterion to the achievement of project goals. The software allows the group or individual evaluators to use a paired comparison process to assign weights for each of the criteria, i.e. comparing two criteria at a time by rating their relative importance to each other, and retaining the one with a higher rating to be compared with the next criterion (Figure a2-19).
Final determination of the weights was then informed by a group discussion derived from individual judgment based on their knowledge and expertise in the field (Figure a2-20). Individual opinions were debated and compared. The process was iterative until group consensus was reached. Below charts shows an indicative result of the weighting of criteria on the Hospital X case:

**Step 5: Scoring – assess the expected performance of each option against the criteria**

This step is to construct scores representing preferences of the consequences for each option. Similar to the previous step, the process was conducted by pare-wise comparison of two options at a time, assessing expected performance of each option against specific criteria, followed by another option (Figure a2-21). Consistency was
checked to make sure that scoring has been constructed appropriately to generate valid results.

What is your preference in the context of: Strategic fit?

<table>
<thead>
<tr>
<th>100% private financing</th>
<th>PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>□ More preferred</td>
<td></td>
</tr>
<tr>
<td>□ Equally preferred</td>
<td></td>
</tr>
</tbody>
</table>

Figure a2-21. MCDA Step 5- Scoring

**Step 6: Combine the weights and scores for each option to derive the overall score**

Once the above steps are completed, the overall weighted score for each option was automatically generated by the software (Figure a2-22). Besides the overall score, evaluators may also choose to compare options by breakdown score for each of the criteria. In the case of Hospital X, PPP model got the highest overall score. However, under the criterion of commercial consideration, PPP option scored less than the private financing option, reflecting group concerns that PPP model may not be as responsive and efficient as the private sector is in meeting local health demands. This can be relevant to the final decision, if for example, filling the gaps of certain specific types of medical services is the most pressing needs, e.g. medical imaging services, and PPPs may not be as efficiently provide needed services than a private provider. In practice, evaluators may choose to drill down the issue by extensive discussions, or requesting further information to legitimize the trade-offs.

Figure a2-22. MCDA Steps 6– Combing Weight and Score
**Step 7: Examine the result**

The final score gives an indication of the overall preference between options. However, participants were noted that it is always important to move down to specific criteria level to deepen the understanding of the main trade-offs between options. In the case of Hospital X proposal, as compared to private financing, PPP may be better off in managing risks if the risk-sharing mechanism is well constructed to allow public and private partners to take care of the risks that they are best able to handle. However, participants also emphasized that the PPP project needs to have a robust operational design in place to ensure that when public funding exists, the hospital X will continue operating and providing services at desirable cost and quality. The sustainability issue shall be discussed in line with access to essential medicines and universal health care in the recipient country. Participants also discussed the potentials for the hospital to act as a platform for integrated Chinese health aid, including hosting Chinese medical teams, as well as receiving donations of drugs and medical equipment. Issues were also debated such as the recruitment, development, training, and retention of health workforce in and for developing countries, and how services provided by China-aided hospital could seamlessly fit into the overall health care system of the host country in a sustainable model.

The process of examining and debating the results proved to be an important step of the decision process for participants to understand implications of new perspectives revealed by the MCDA, and explore discrepancies between MCDA results and their own “intuitions”. It also provides solid foundations for making reasoned decisions and policy recommendations.

**Step 8: Sensitivity analysis**

Sensitivity analysis is potentially useful in resolving the disagreement between interests groups, which may have different views on the relative importance of certain criteria or scores. In this case, sensitivity analysis was done simply by examining to what extent the ranking of options changes under different scoring or weighting. By making the process more participatory, the sensitivity analysis helped decision makers reach more satisfactory solutions.
Appendix 3. Summary Slides of Other Deliverable: Improving the Efficiency of PPP for China’s South-South Cooperation

DELTA Thesis Appendix 3 - Other Deliverables
Improving the Efficiency of PPP Management in SSC

Following slides summarize the key deliverables of a series of study and management support efforts that aim to help improve the operational efficiency of Public Private Partnership (PPP) projects. Being an integral part of the DELTA project, these deliverables were developed in Chinese, with focus on following areas:

- Policies and strategies of leveraging private capital
- PPP management arrangements and cooperation frameworks in key development sectors
- Major achievements and challenges of PPP in global aid
- Definition, mechanism and effectiveness of PPP for SSC
- Policies, tools and methods to strengthen appraisal, planning, implementing, and oversight of PPP projects
China’s Foreign Aid Overview

Sources: JICA (2016)

PPP in Global Development Aid

Sources: DAC statistics (2016)
南南合作模式下的PPP创新环境
Policy Environment for PPP for SSC

- 扩展的发展融资概念
- 国有企业市场化改革
- “走出去”战略
- 大援助格局
- 社会资本与官方援助、贸易和官方投资相融合
- 结合比较优势的发展援助经验分享

挑战与问题
Challenges and Issues

战略上：缺乏展开社会资本合作整体布局
理念上：区别与传统的发展援助“公共性”
概念上：私营部门的角色和作用定义不清
操作上：缺少有效的管理措施和工具
沟通上：合作方之间缺乏有效的交流和理解

Sources: Wang & Lin (2016)
研究方向与重点
Priorities and Focus

南南合作发展援助中的公私伙伴合作关系：

- 合作关系定义
- 使用原则和范围
- 法律政策环境
- 关键成功因素
- 可预见的挑战
- 监督和管理工具

PPP的主要特点
Main Features of PPP

<table>
<thead>
<tr>
<th>主要区别</th>
<th>传统采购</th>
<th>PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>资产所有权</td>
<td>公有</td>
<td>公私混合</td>
</tr>
<tr>
<td>资源投入</td>
<td>公共投入</td>
<td>共同投入</td>
</tr>
<tr>
<td>重点衡量</td>
<td>项目投入</td>
<td>项目产出</td>
</tr>
</tbody>
</table>
PPP基本合同类型

Main Types of PPPs

南南合作下的PPP定义（建议）

Suggested Definition for SSPPP

助部门为协助发展中合作国家达成可持续发展目标，为受援国人民提供更多、更好和更可持续的公共服务而与社会资本合作伙伴达成的一种横向合作策略。南南合作中的PPP方式强调优势互补、风险分担和利益共享。

在南南合作PPP模式下，公共部门的角色由援助方和受援方共同组成，双方合作成为公共设施和服务的组织者、资助者和监管者，社会资本也通过PPP合作从单纯的服务提供转变为与援助双方的主动长期合作，从而不断提升服务的可及性、质量和可持续性。”
常规PPP与南南合作PPP的区别
Regular PPP Vs SSPPP

南南合作框下的PPP创新
New Features of PPP in SSC

PPP的一般实施逻辑：
- 解决公共需求与有限财政资源的矛盾
- 将一部分风险与社会资本共同分担
- 引进经过市场验证的技术和经验

SSPPP实施逻辑十：
- 扩大援助合作规模与影响
- 互利共赢，义利兼顾，以义为先
- 助力多种援助模式的有机结合
- 将南南合作转化为受益国内生可持续发展动力
南南合作下的PPP — 贡献与挑战
SSPPP – Contribution and Challenges

<table>
<thead>
<tr>
<th>PPP对南南合作的贡献</th>
<th>PPP在南南合作中的挑战</th>
</tr>
</thead>
<tbody>
<tr>
<td>引入全过程成本控制</td>
<td>项目评估和甄别的责任</td>
</tr>
<tr>
<td>公共部门风险降低</td>
<td>缺乏清晰度的监督指标</td>
</tr>
<tr>
<td>公共服务可预见性增强</td>
<td>风险防控和应对机制不足</td>
</tr>
<tr>
<td>引导向优先发展领域的投资</td>
<td>复杂的筛选协议和合作流程</td>
</tr>
<tr>
<td>带动受援国技术产业转型</td>
<td>政策环境、管理框架、监管机制、合约采购流程不完善</td>
</tr>
<tr>
<td>制造商业机会带动产业发展</td>
<td>建设、监管和运营期的风险</td>
</tr>
<tr>
<td>创造本地就业</td>
<td>南南合作援助方与受援方在不同阶段的责任和义务划分</td>
</tr>
<tr>
<td>其他正向外部因素</td>
<td></td>
</tr>
</tbody>
</table>

PPP在南南合作中的实施条件
Applicability of PPP in SSC

- 宏观因素
  - 宏观经济条件
  - 社会发展背景
  - 政治局势

- 支持环境
  - 基本法律与治理框架
  - 政策支持与监管条件
  - 资源共同投入

- 执行操作
  - 机构执行能力
  - 管理框架与标准流程
  - 内外协调机制
SSPPP管理流程
Standard Management Procedures for PPP
多条件决策分析法(MCDA)

- 适用于PPP项目的预评估或优先排序过程
- 可用于一个项目不同实施方案的比较分析（如政府采购、PPP和NGO执行方式对比）
- 也可用于不同项目在多个评估条件下的对比（如执行成本、风险、可持续性等）
- 自定义评估条件，灵活性强
- 可生成图形或文字分析结果便于展示和留存备案
- 可用于个人或团队参与式评估，过程与结果直观、操作简便

SSPPP项目分阶段管理（示意图）
PPP Management by Stages

相关投入、承担风险与责任

建设期 1-3年 运营期 3-5年 可持续发展期 5年+
PPP监督评估组成部分
Key Components of PPP M&E

SSPPP不同阶段评估重点
Focus of Evaluations at Various Stage of SSPPP
PPP案例分析
PPP Case Studies

经验与教训：
○ 因外部环境压力导致政府改变策略引发的PPPs失败案例
○ 基础设施规划不善的例子
○ 失败的风险监控案例
○ PPP背景下的扶贫措施
○ 基于绩效的PPP合作
○ 全过程成本控制的PPP合作模式
○ 非招标技术创新合作
○ 独家采购或非应标建议 - 运用价格测试增加竞争性
○ 美国援助署（USAID）应用PPP的经验
○ 世界银行全球PPP业务综合回顾

PPP全球经验与知识分享
Global Exchange and Sharing