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Managing and financing metropolitan public services in China: experience of the Pearl River Delta region

XIE Baojian, YE Lin and SHAO Zijie

Under China's current fiscal policies and inter-governmental relations, it is a significant challenge to finance and deliver public services across jurisdictions. This challenge was met in the Pearl River Delta region in southern China with a collaborative governance approach. Directives from higher-level governments and horizontal inter-city fiscal arrangements were successfully combined to deliver public services. Effective networks should be developed to improve co-ordination and collaboration in delivering cross-jurisdictional public services.

Keywords: Collaborative governance; fiscal policy; inter-city public services; inter-governmental relationships; network governance; Pearl River Delta region.

Inter-governmental fiscal relations and inter-city public services are among the most challenging public management issues in China. The national government provides policy guidance and fiscal allocations to subnational governments for certain services. However, many municipal and inter-city public services are entirely left to local governments. Under the current inter-governmental fiscal arrangements, there are gaps in the financing and management of metropolitan public services. This paper answers the following questions:

- How do the existing inter-governmental relations influence finance and management of inter-city public service arrangements?
- What factors influence sub-national governments' behavior in delivering different kinds of inter-city public services?
- What lessons does the Pearl River Delta (PRD) region experience provide to other areas?

The relationship between different levels of government has long been discussed in China. As early as 1956, MAO Zedong foresaw the problematic nature of the relationship between the central government and lower levels, including provincial and local governments, in his *Ten Major Relations* (Mao, 1956). In a vast country, such as China, Mao believed local governments should be encouraged to be active and independent in economic development,

instead of solely relying on the central government. Sixty years later, the central government still found it necessary to issue *Guidance on Advancing the Reform of Divisions of Revenues and Expenditure Responsibilities between the Central and Local Governments* (State Council, 2016). This demonstrated the persistent nature of problems of inter-governmental relations in China (Zhang, 2017) and in many other countries (Ahmad and Brosio, 2015).

Missing in the academic literature on inter-governmental fiscal relations and management is the important issue of how sub-national governments act horizontally to perform public functions. As outlined in article 3 in the State Council No. 49 Decree, one of the major tasks is to reform the divisions of revenues and expenditure responsibilities at the sub-national level and among local governments, including the public service functions in basic living conditions, public safety, urban development and infrastructure (State Council, 2016). Many of the public service functions are cross-jurisdictional matters and involve multiple units of local governments, or even provincial governments. The study of the relationship among sub-national governments with regard to regional public functions and cross-jurisdictional services is integral to the analysis of inter-governmental relationships in China.

Following a discussion of financing and managing cross-jurisdictional public services at the sub-national level, this paper presents a

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network governance analysis of two cases on the infrastructure and environmental services in the Guangzhou–Foshan metropolitan area in the PRD region, and concludes with experiences and lessons from these cases.

Financing and managing cross-jurisdictional public services at the sub-national level

Some economists have offered explanations for financing and managing cross-jurisdictional public services. Hayek (1945) proposed that local governments had better information on citizen preference, so they were most suitable to make decisions and arrange public services. Tiebout (1956) stated that the competition between jurisdictions would allow residents to choose the best place to live to get good public services. Musgrave (1959) and Oates (1972) believed that appropriate assignment of jurisdictions over public goods and taxes could improve delivery efficiency. Cross-jurisdictional co-operation could also be used in designing suitable mechanisms for managing regional affairs (Andrew and Feiock, 2010; Hawkins, 2010).

Regional development has become a significant urban development pattern in recent years, and so more attention is being paid to the inter-city issues of public policy and service delivery in China. On the one hand, the national government possesses ultimate authority in China (Tsai, 2004) but, on the other hand, economic reforms and the fiscal reforms have had a decentralizing effect on inter-governmental fiscal relations (Wu and Wang, 2013). Bird and Chen (1998) distinguished between three forms of ‘decentralization’: ‘deconcentration’, where some responsibilities are transferred from the central to sub-national units; ‘delegation’, where local governments act as agents of the central government; and ‘devolution’, where local governments are given decision-making authority. The Chinese case is the closest to the first scenario.

With the trend of fiscal decentralization on the expenditure side for the past two decades, horizontal inter-governmental co-operation has become increasingly important in inter-city public service delivery in China (Xu and Yeh, 2013). Yet, due to the lack of proper formal institutional structures in place for inter-city public services, local governments are obliged to adopt collaborative governance through negotiations and the formation of governance networks (Peters and Pierre, 2001; Bevir, 2003). Collaborative governance is ‘the processes and structures of public policy decision-making and

management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished’ (Emerson *et al.*, 2011, p. 2). There are several important system factors contributing to the formation of networks for collaborative governance including: a multilayered context of political, legal, socioeconomic, environmental, and other conditions; essential drivers, such as leadership, incentives, interdependence; and collaborative dynamics, such as principled engagement, shared motivation, capacity for joint action.

Inter-governmental relations and network theories have been used to study horizontal network management and collaborative public management (Agranoff and McGuire, 1998, 2001; Kamensky and Burlin, 2004). Networks play an important role in co-ordinating activities when issues are cross-jurisdictional and individual governments need to pool scarce resources (Kickert *et al.*, 1997; Nyholm and Haveri, 2009). Agranoff and McGuire (1998) identified three forms of horizontal networks among American local governments: policy- and strategy-making, resource sharing, and project-based. The network form of governance has advantages over both hierarchy and market solutions in simultaneously adapting, co-ordinating, and safeguarding exchanges (Jones *et al.*, 1997). Tofing (2005) discussed the development of a second generation of governance network research by considering the meta-governance of self-regulating networks, the role of discourse in relation to governance networks, and the democratic problems and potentials of network governance. Newman and Thornley (1997) analysed the impact of network governance on London’s urban policy-making and found that multiple actors are involved in policy design and implementation. Ferlie *et al.* (2011) argued for benign ‘post-bureaucratic’ leadership with high engagement levels from multiple parties to overcome government fragmentation.

Studying different modes of network governance and its effectiveness in public policy, Provan and Kenis (2008) identify four key structural and relational contingencies: trust, size (number of participants), goal consensus, and the nature of the task. Networks governed by a unique network administrative organization are popular in developing countries for dealing with complex policy issues in rapidly changing socioeconomic environments (Wang and Yin, 2012). In an

inter-governmental context, Wang *et al.* (2016) identify the financial, technical and managerial capacity of network administrative organizations in implementing collaborative governance.

The following sections analyse the issues identified in this literature to investigate the effectiveness of network governance and related capacity factors in providing two inter-city public services in the PRD region.

A 2x2 design for studying inter-city services

Our research had a 2x2 design: two public services (urban transportation infrastructure development and water quality control) in two municipalities (Guangzhou and Foshan). The rationale for this is that it takes at least two jurisdictions to study inter-city relations, and we were interested in comparing 'hard' and 'soft' public services. Urban transportation infrastructure development received the most attention under the umbrella of Guangzhou–Foshan metropolitan integration plan (Ye, 2014). Water quality control is another important area in national, provincial and municipal plans established to clean the water in this region. Most water quality control plans are implemented across jurisdictional boundaries and require both Guangzhou and Foshan to take action. Transportation infrastructure development is viewed as promoting economic growth, while water quality control may be characterized as a redistributive function, thus providing useful comparisons.

To study the two services, we analysed the contents of documents to learn about the plans and projects. The planning documents examined included the National Master Plan of Urban System 2010–2020; the National Key Functional Area Master Plan; the Outline Plan for the Reform and Development of the PRD (2008–2020); the Guangzhou Urban Development Master Plan 2010–2020; the Foshan Urban Development Master Plan 2010–2020; the Guangzhou and Foshan Metropolitan Integration Development Plan 2009–2020; the 13th Five Year Plan of Guangzhou and Foshan Integration; the Working Plan of Guangdong Province Water Quality Control Act 2013–2020; the Guangzhou Cleaner Water Act 2013–2020, and the minutes of the annual joint mayoral meeting between Guangzhou and Foshan, as well as other related documents.

We collected additional qualitative evidence through interviews with government officials in the relevant departments in these two cities,

including the development and reform commission, land and planning commission, transportation, environmental protection and water management. The dates for cited interviews in this paper are listed in each quotation. All interviews were recorded and transcribed. A thematic analysis of the interview transcripts resulted in a number of themes and sub-themes. This paper includes only the relevant subthemes and quotations from the materials collected for a larger research project.

Inter-city subway

One of the most significant patterns of China's urban development in the past three decades was the formation and growth of metropolitan regions (see, for example, Wu and Zhang, 2007; Xu and Yeh, 2010, 2013; Ye, 2013, 2014). The growth of these regions has been described as 'an outcome of carefully planned economic and administrative policies' (Ye, 2013, p. 292). According to the China's regional economic development report, three metropolitan regions accounted for more than 40% of the total national GDP, with about 18% of the national total population (Liang, 2015). Among these regions, the PRD region is unique in that it is entirely in the province of Guangzhou. This makes regional policies and inter-city agreement relatively easier to reach, due to the strong directive authority of the provincial government of Guangdong in regional issues (Lin, 2001; Xu and Yeh, 2013; Ye, 2013, 2014).

Guangzhou and Foshan are adjacent to the PRD region. Guangzhou, the third largest city in China, has a total population over 14 million and a land area of over 7,400 km², and a per capita annual GDP of over 120,000 RMB. Foshan is an average-sized city in China, with a total population over 8 million, and land area of over 3800 km², and a per capita annual GDP around 100,000 RMB. The development of the Guangzhou–Foshan metropolitan region has been a flagship case for inter-city cooperation in China (Xu and Yeh, 2005; Ye, 2014). Such a vision and ambition for metropolitan development can be found in the two cities' strategic plans. In 2000, the Guangzhou municipal government launched the Guangzhou Urban Development Strategic Concept Plan and announced the strategy of 'exploring to the south, optimizing the north, moving to the east, connecting the west', of which the 'connecting to the west' refers to the linked development between Guangzhou and Foshan. In 2011, the metropolitan-wide development vision was reinforced in the

Guangzhou urban development master plan 2010–2020. The Foshan urban master plan 2011–2020 emphasized utilizing the integrated development of Guangzhou and Foshan to promote a linked metropolis that would benefit Foshan's growth and development.

In 2009, Guangzhou and Foshan established a biannual joint mayoral meeting and signed a metropolitan integration agreement (MIA) between the two cities. Under the framework of the MIA, four policy documents were put in place in the areas of economic co-operation, urban planning, environmental protection, and transportation infrastructure. The joint mayoral meeting set up an annual key work plan for Guangzhou–Foshan. Each project in the annual key work plan was implemented with a specific deadline and corresponding agencies in the two cities (Ye, 2014). Among these projects, the Guangzhou–Foshan inter-city subway has been the most significant. As early as in 2001, Guangdong province, in its 10th five year plan (2001–2005), passed the PRD inter-city rail rapid transit development plan and the Guangzhou–Foshan inter-city subway (GFIS) was the first project delivered. One subway station site was put into test construction in 2002. In 2003, the GFIS project construction plan was made by China International Project Consulting Corporation and submitted to the National Development and Reform Committee (NDRC). This plan was approved in 2005, making the GFIS the first inter-city subway in China. The construction of the GFIS started in 2007. The first section of the GFIS opened in 2010, with 14 stations and a total mileage of 20.47 km (14.8 km in Guangzhou and the rest in Foshan). The second section of the GFIS was completed in December 2016. By 2016, the GFIS had a total distance of 53.63 km (32.16 km in Guangzhou and 21.47 km in Foshan).

The construction and operation of the GFIS is worth close examination. In order to carry out the GFIS project, Guangzhou and Foshan established the Guangdong Guang-Fo Rail Transit Company Ltd (referred to as 'the joint company' hereafter). The initial funding for this state-owned company was provided by the two municipal governments, together with fiscal subsidies from the Guangdong provincial government. For the 14.5 billion RMB initial funding, 55% was contributed capital and the remaining 45% was raised with loans made by the two governments. The provincial government provided 10% of the required capital contribution, with the remaining 45% covered by the Guangzhou and Foshan local governments on a 51:49 basis. All funding responsibilities were

proposed during the joint mayoral meetings between the two cities, agreed by the two governments, and were approved by the provincial government.

Such a shared financing arrangement was apparently intended to give Guangzhou control over the construction and operation of the GFIS. Before the GFIS was built, the city of Foshan did not have a subway. The construction of the GFIS provided Foshan with an unprecedented opportunity to develop its underground transit system. As the 'big brother', Guangzhou usually maintains a leading position in inter-city issues. The GFIS project was no exception because Guangzhou had the construction technology and operational skills for a modern subway system. Without Guangzhou's contribution, the construction and operation of GFIS would have been virtually impossible. In order to carry out the construction of the GFIS, the Foshan municipal government established a fully state-owned Foshan Railway Investment Group Company Ltd for the construction and management. Its counterpart in Guangzhou is the Guangzhou Subway Group Company Ltd, established in 1992. Thus, the two fully state-owned enterprises of Foshan Railway Investment Group Company and Guangzhou Subway Group Company acted on behalf of the two local governments in the GFIS projects.

Since the municipal government of Guangzhou provided a larger share of funding, the chairman and the general manager of the joint company were both appointed by the Guangzhou municipal government and the Guangzhou Subway Group Company. Subsequently, the Guangzhou Subway Group Company appointed its vice general manager to the chairmanship of the joint company. Moreover, since the Foshan Railway Investment Group Company did not have any prior experience in subway construction and operation, the joint company signed a management responsibility contract with the Guangzhou Subway Group Company. Figure 1 shows the establishment, organization, and management of the GFIS.

Since 2009, the GFIS construction has been a top agenda item for of every joint mayoral meeting and in the annual key work plans. Inter-city infrastructure projects like the GFIS have been well received by both the provincial and local governments. The provincial government approved the GFIS plan, submitted the plan to and convinced NDRC in the central government, then provided funds to fill the funding gap. The neighboring local governments contributed to the project as they were able to.

The water quality control programme

Not all inter-city projects have been as successful as urban transportation. Around two-thirds of the annual key work plan projects implemented between 2009 and 2013 are infrastructure building and economic co-operation programmes (Ye, 2014). These projects are favoured because they generate economic outputs and stimulate local growth—the most important objectives of local governments in China. Other programmes, such as environmental programmes, are much less popular.

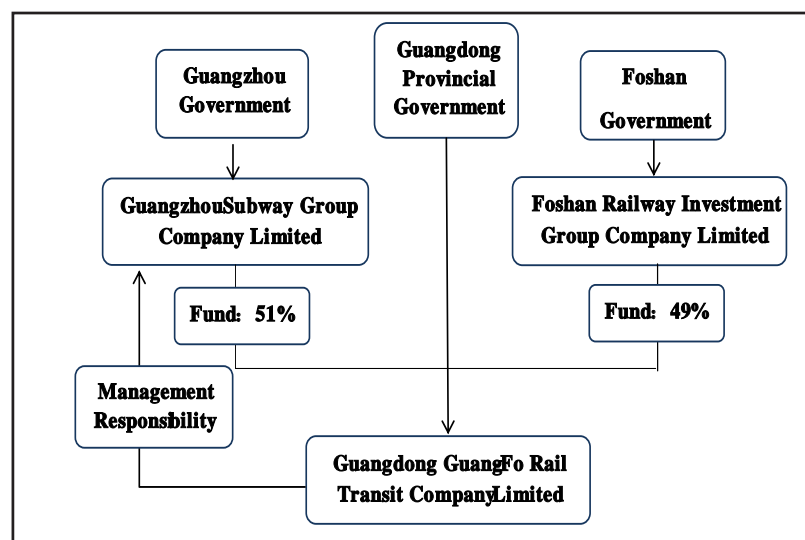
Co-operation in water quality control between Guangzhou and Foshan was one of the major projects in the MIA signed by the two governments during the first joint mayoral meeting in 2009. In 2013, the Guangdong provincial government approved the Guangdong Cleaner Water Action Plan 2013–2020. In it the Guangzhou and Foshan Cross-Jurisdictional Water Pollution Comprehensive Control Special Plan (referred to as ‘the special plan’ hereafter) was announced as a pilot programme to tackle inter-city water pollution problems in the Guangdong province. The special plan set clear targets and tasks for the governments of Guangzhou and Foshan from 2013 to 2020. For example, Guangzhou was required to maintain its water quality above category IV and Foshan above category V by the end of 2013 (category I being the best). By 2015, Foshan had to achieve the same water quality level (category IV) as in Guangzhou. The water quality in the designated sections of the Pearl River, which runs through the two cities, should reach category III. By 2020, water quality in both cities should reach the respective required standards.

In order to reach these goals, the provincial government mandated the two municipal governments to set out specific plans in 2013 by surveying bodies of water and existing pollutants. The two cities needed to adjust their industrial structures according to the Guangdong Industry Structure Adjustment Guiding Catalogue. The special plan required the city of Guangzhou to build nine water treatment plants by 2015, increase the city’s daily treatment capacity by 70 tons, and extend the city’s sewage pipeline by 505.4 km. Foshan needed to increase its daily treatment capacity by nine tons and extend its sewage pipeline by 83 km. Both cities were required to enhance their treatment capacity for sewage from 90% in 1995 to 95% in 2020. Sixteen rivers were identified as the inter-city water quality control areas by the special plan.

The city of Guangzhou passed cleaner water legislation and treatment plans for cross-city rivers between Guangzhou and Foshan in 2014. Around 14 billion RMB was set aside to implement these plans from 2013 to 2016, according to the Guangzhou Water Management Bureau (interviewed in July 2017). The city of Foshan established their water quality control comprehensive plan 2015–2020, with 84 projects and a total budget of 3.08 billion RMB. In 2016, among the 258 inter-city water quality control projects sponsored by Guangzhou and Foshan, 151 had been completed, 66 projects were underway and 41 projects were in preparation. All of the funds necessary for these water clean-up efforts had to be raised by the two cities themselves. For the 16 cross-city water body treatment projects, the two municipal governments adopted a river master policy requiring the districts through which water flowed to be financially responsible for clean-up. Joint enforcement projects between the two cities were arranged on an *ad hoc* basis, according to the Guangzhou municipal government office (interviewed in April 2017).

There was confusion in decision-making and operation because multiple agencies were involved in the policy design and implementation process. These included the water management bureau, the environmental protection department, and a number of offices in the municipal development and reform commission. For instance, while the water management bureau was the lead agency, at least three offices (regional affairs, environment and resources, and municipal development) under the municipal development and reform

Figure 1. The structure of the GFIS investment fund management.



commission participated in overall planning, cross-border negotiation, and urban economy issues related to water quality control. The water management bureau was responsible for cleaning up pollutants in the water, but did not have any authority to punish the polluters, which include several major industrial plants sited along the rivers. The environmental protection department was in charge of regulating and levying fines on polluters. Co-ordinating across multiple departments has been difficult due to limited financial resources, unclear organizational functions, and a poorly co-ordinated network. 'We do not know which department is responsible for what functions. It is hard to see how the fiscal resources are allocated' according to an official in the environment and resource office in the Guangzhou municipal development and reform commission (interviewed 1 September 2017).

Discussion

The division of duties and allocation of resources were significantly less effective in the water quality control programme than in the transportation infrastructure projects. Table 1 summarizes the difference between two cases, using the key factors identified in the literature cited earlier.

As table 1 shows, the transportation project had higher density trust, fewer agencies (clearer duties), higher goal consensus, and moderate need for network-level competencies, in comparison to water quality control actions. A 'shared governance' model was in place because of the willingness of two cities to establish the GFIS with active involvement by the provincial government. A highly-effective network governance model was available to stimulate the stable expansion of the inter-city subway.

Such a development drove another round of financial investment and economic growth in both cities, particularly in Foshan. Growth in real estate development in Foshan was attributed to the expansion of GFIS (Wangyi Real Estate News, 2017). The construction of GFIS also enabled the residents of Guangzhou to enjoy a 30-minute commute to amenities in Foshan and won the inaugural Huace Subway Award from the Chinese Real Estate Development Association in 2015.

Effective co-operation in water quality control would require a lead organization or a network administrative office as described in Provan and Kenis (2008). In reality, however, it is not easy to have a single agency take the lead in environmental regulations that have wide impact on economic growth and local development. The involvement of the senior government, namely the Guangdong provincial government, would be ideal. However, this did not happen in the Guangzhou–Foshan case.

Xu and Yeh (2013, p. 149) developed the model of bargaining and negotiation, where once a partnership is formed and adopted, the implementation process is characterized by negotiation among and between levels of the hierarchy. Each agent aims to steer the plan in a direction favourable to its own interests. The outcome may not be as originally intended, but it is worked out through extensive bargaining. This paper argues that sub-national governments in China developed selective mechanisms in dealing with inter-city public policies and services. As shown in the GFIS case, governments at the central and provincial level provided institutional support for the development plan while funding was agreed by the two governments of Guangzhou and Foshan, with the provincial government providing some of the investment funding,

Table 1. Comparison of two cases by key predictors of effectiveness of network governance forms.

<i>Case</i>	<i>Trust</i>	<i>Size</i>	<i>Goal consensus</i>	<i>Nature of task</i>
Transportation infrastructure (more effective)	High density—delegating GFIS's operational responsibility to the Guangzhou Subway Group Company Ltd	Few—primarily the subway companies in the two cities	Moderately high—stimulating economic growth and local development	Moderate—relatively straightforward, with senior government's active attention and effective co-ordination
	High financial capacity	High managerial capacity	Shared motivation	High technical capacity
Water quality control (less effective)	Low density—multiple multiple agencies of water management, environmental protection and development	Moderate—multiple agencies without a leading authority	Moderately low—potential conflict between environmental protection and economic growth	High—more complicated, lack of senior government attention or effective co-ordination
	Low financial capacity	Low managerial capacity	Mixed motivation	Low managerial capacity

making the inter-city subway project financially sound. Since Guangzhou is a much stronger city than Foshan, the two municipal governments took advantage of Guangzhou's subway management capacity by fully contracting out the GFIS operation to the Guangzhou Subway Group, enhancing the managerial capacity of the project. Fiscal and administrative agreements were not difficult to reach in this case since the GFIS would clearly bring economic benefits to both cities, the province and to the overall development of the PRD region. Multiple levels of governments act proactively to create an inter-governmental network to advance the project.

In light of the environmental protection projects, such as the water quality control between the two cities, few flexible fiscal arrangements were reached because such projects tend to produce negative externalities with few economic benefits. In this case, the provincial government had to assume a co-ordinator's role and direct inter-city efforts, by establishing strict regional policies and enforcing implementation guidelines. Vertical inter-governmental guidance and direction is more important in this regard. Referring to the analytical framework proposed by Wang *et al.* (2016), the project lacked financial capacity due to the difficulties of getting and enforcing financial commitment from the two cities involved. Technically the clean water standard was set up but, managerially speaking, duties were unclear and there was a low level of shared motivation among overlapping agencies, which made inter-city water quality control difficult to implement.

Conclusion

This paper has described the institutional context for China's inter-governmental relations and explained the financial and managerial requirements of two horizontal network arrangements. It takes into account the nature of economic activities and types of services and argues that, under the current inter-governmental structure in China, economic principles and management practices need to be adapted to deal with the issues of inter-city services. Local governments in China are making selective inter-governmental arrangements to accommodate regional collaborations. The findings in this study help to clarify transformational inter-governmental relations, particularly at the sub-national level and how it influences inter-governmental fiscal management in metropolitan public service delivery in China. Future research is needed to

further compare the delivery of metropolitan public services in other national contexts in order to offer more generalized evidence and recommendations for developing countries.

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IMPACT

How to finance and deliver public services across jurisdictions is a significant challenge to public officials and academic researchers. This paper offers a new way of tackling this issue with a collaborative governance approach in the Pearl River Delta region in southern China. Local governments tended to favour projects with positive economic benefits and visible outputs over less productive tasks such as environmental protection. Effective networks will enhance co-ordination and collaboration in delivering cross-jurisdictional public services. The lessons in this paper will be helpful for countries that are undergoing rapid urbanization.

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