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## 主 論 文 の 要 旨

論文題目

Government Securities Market Development in  
Lower-Income Economies: Discovery of “Utilities”

(低所得国における国債市場育成政策: ユティリティーの発見)

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## 論 文 内 容 の 要 旨

The government securities market (GSM) is a core economic infrastructure for modern economic management. Hence, the international development community (IDC) established a comprehensive policy framework for GSM development in the early 2000s (the conventional policy framework–CPF) and undertook GSM development initiatives for more than two decades. However, the results are disappointing for lower-income economies (LIEs).<sup>1</sup> The secondary markets of most LIEs remain illiquid or considerably low liquid. Nonetheless, no efforts have so far been made to review the CPF.

This dissertation aims to improve upon the CPF for LIEs. To this end, the dissertation poses two questions: why and how has the CPF not worked for GSM development in LIEs, and how the CPF can be improved upon to be more effective for LIEs. I took three steps: reviewing the practicality of a

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<sup>1</sup> This dissertation defines the World-Bank-defined low-income economies (LIEs) and many lower-middle income economies (LMEs) as “lower-income economies” unless otherwise specified. The World Bank defines low-income economies and lower-middle-income economies as those with a GNI per capita of \$1,025 or less in 2018 and those with a GNI per capita between \$1,026 and \$3,995, respectively. (<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>) “Emerging economies” in common parlance include not only “lower-income economies” but also higher-income economies that are not included in “advanced economies.”

primary dealer system (PD system), the CPF's core policy for LIEs, proposing an alternative framework, and testing the alternative framework for applicability.

For the first step, I estimated the economies of PD systems by decomposing observed bid-ask spreads into order-processing, adverse selection, and inventory-holding costs (the three-way decomposition).

The GSM data of 12 LIEs and 22 High-Income Economies were collected from Bloomberg.

For the second step, I introduced a "Two-Dimensional Policy Framework for Government Securities Market Development" (TDPF) alternative to the CPF. During my fieldwork in Mumbai, India, from September to December 2019, I tested the TDPF for its practicality in an early-phase market against the policies that Indian policymakers had implemented in the 1990s and the 2000s. Also, I undertook semi-structured interviews and written surveys with Indian primary dealers (PDs) about their PD system's workings and collected the Indian GSM's monthly averages of daily market data from 2005 to 2019 from the local clearing corporation. I regressed observed trade volumes on endogenous market variables with Autoregressive Distributed Lags (ARDL) models and used a stepwise method to estimate endogenous variables' contributions to the trade volume growth.

For theorizing the economic agents' behavior in GSM development, I applied the theories and concepts borrowed from established fields outside GSM development. The theories and their primary authors (in parentheses) include the externalities, public goods, and club goods theory (Ronald H. Coase, Richard Cornes, and Todd Sandler), the transaction cost economics (Ronald H. Coase, James M. Buchanan, and Oliver E. Williamson), the cooperative game theory (Francis Ysidro Edgeworth, Werner Hildebrand, Richard Cornes, and Todd Sandler), the diffusion of innovation theory (Everett M. Rogers), the disruptive innovation theory (Clayton M. Christensen), the product life cycle and buying hierarchy theories (Geoffrey Moore and Clayton M. Christensen), and the loss aversion theory (Daniel Kahneman and Amos Tversky).

The estimated economies of PD systems implied that contrary to the CPF, PD systems were hardly working in most of the LIE environments. India was an exception. The fieldwork in Mumbai found that the Indian GSM policymaker had independently implemented policies that the TDPF mapped for the Nascent and Evolving Phases. The interviewed Indian PDs unanimously attributed the Indian GSM's success to the "ease and transparency" of their integrated trading, clearing, and settlement system with a central counterparty function. The ARDL model run showed the "ease and transparency" (its proxy) and other endogenous variables explained 40 percent of the trade volume growth in the rapid market growth period from 2005 to 2013. The theories borrowed from outside GSM development were developed to explain economic agents' real-world behaviors, in contrast to the efficient-market hypothesis or the perfect market theory. They explain well the observed trading behaviors in the early-phase markets.

These findings suggested that improving on the CPF would require a better understanding of GSMs' evolution and diversity than before. The CPF implicitly conflated GSMs that were in different development phases. As such, inadvertent mismatches between adopted policies and LIE realities often misled GSM development in LIEs. The phase-differentiated and phase-coherent TDPF would mitigate mismatch risks. Apart from the effects of unmanageable exogenous policy variables, the GSM policymaker's work on endogenous policy variables would be significantly practical for GSM development. The GSM policymaker needs to manage endogenous policies to ride on favorable environments for successful GSM development. Hence, this dissertation argues that endogenous market development through the TDPF would be practical for the GSM policymaker. The policymaker is part of a development phase.

Meanwhile, a GSM's public/impure-public good setting for the market structure warrants the government intervention in GSM development and operation through regulation, subsidies, and direct or indirect provision. Consequently, the government is the primary provider of the utilities and the

positive externalities released from a market structure. This public/impure-public good setting explains historically differing policy bases for early-phase and highly advanced GSMs and justifies the government's policy differentiation. Without the government's intervention, a GSM's explicit transaction costs would be prohibitively expensive from the beginning and defeat the GSM's objectives.

This dissertation pointed out the blind reliance on the PD system, introduced phase-differentiation and phase-coherence concepts into the TDPF, a two-dimensional (market development phases versus market components) framework, and discovered and theorized the dominant role of utilities in trade volume growth, especially in early GSM phases or their early stages. The theories borrowed from established fields outside GSM development helped theorize the dynamics of GSM development involving utilities. For example, the public/impure-public good and social optimality theories provided a basis for differentiating market policies between advanced and early-phase markets.

Consumption theories for imperfect markets would equip the GSM policymaker with the predictability of trade volume evolution and phase transition.

This dissertation's contributions cover local policymakers, academics, and practitioners, including the development community. The dissertation first reified the conflated and muddled concept of GSMs into an addressable and analyzable concept primarily through the TDPF. Second, the dissertation opened a new research theme, GSM development in early-phase markets, for academics. Third, this research provided practitioners, including the development community, with a new perspective and a guideline for program formulation.

This research is subject to limitations. Though qualitative evidence is based on a twenty-year field assessment, quantitative evidence is limited to the Bloomberg data and the Indian GSM case.

Especially, the TDPF can be upgraded by getting tested with more GSMs. Inter- or multi-disciplinary

theory application is new to the GSM development study, and further theoretical consistency tests solidify GSM development's theoretical base. This research has excluded market microstructure. However, IT technologies possibly have significant impacts on GSM development policies.

Many issues remain open for future study on GSM development in LIEs. A study on the PD system's interactions between the primary and secondary markets would upgrade policy comprehensiveness. Insights into interactions between a GSM's exogenous and endogenous factors would add more credibility to endogenous market development strategies. A GSM's utility adoption patterns may differ, depending on utility contents, like reliability, functionality, convenience, and utility facilitators/conduits, like technologies, laws and regulations, accounting rules or operational procedures, or overall institutional capacities.