Endogenous Market Development for Government Securities in Lower-income Economies

- efficiency in an imperfect market -

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- Endo, T. (2020) The primary dealer system in lower-income economies. *Emerging Markets Review*, 45, 100715. https://doi:10.1016/j.ememar.2020.100715. Its error-corrected version is available at SSRN: https://ssrn.com/abstract=4084438.

- Endo, T. (2022a). **Endogenous market development for government securities in lower-income economies**. *Emerging Markets Review*, 50, 100844. https://doi.org/10.1016/j.ememar.2021.100844

- Endo, T. (2022b). Utilities and Development Dynamics in Early-Phase Government Securities Markets. Available at SSRN: https://ssrn.com/abstract=4101634

Outline

- Policy question for GSM development
- Conventional policy framework
  - Evidence – the primary dealer system
- Two-dimensional policy framework
- **Endogenous factors**
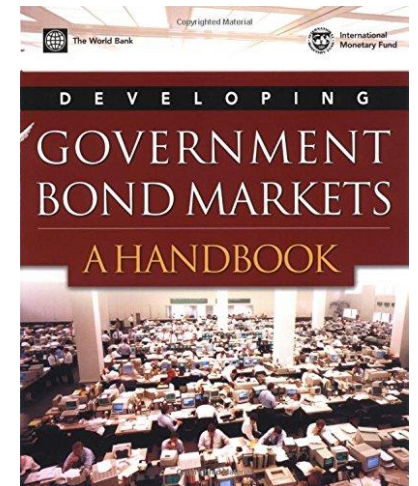 - Utilities and market structure's lifecycle
- Conclusion

Policy Question

- PDM and GSM are "the wheels of a cart."
- A functioning GSM for effective PDM.
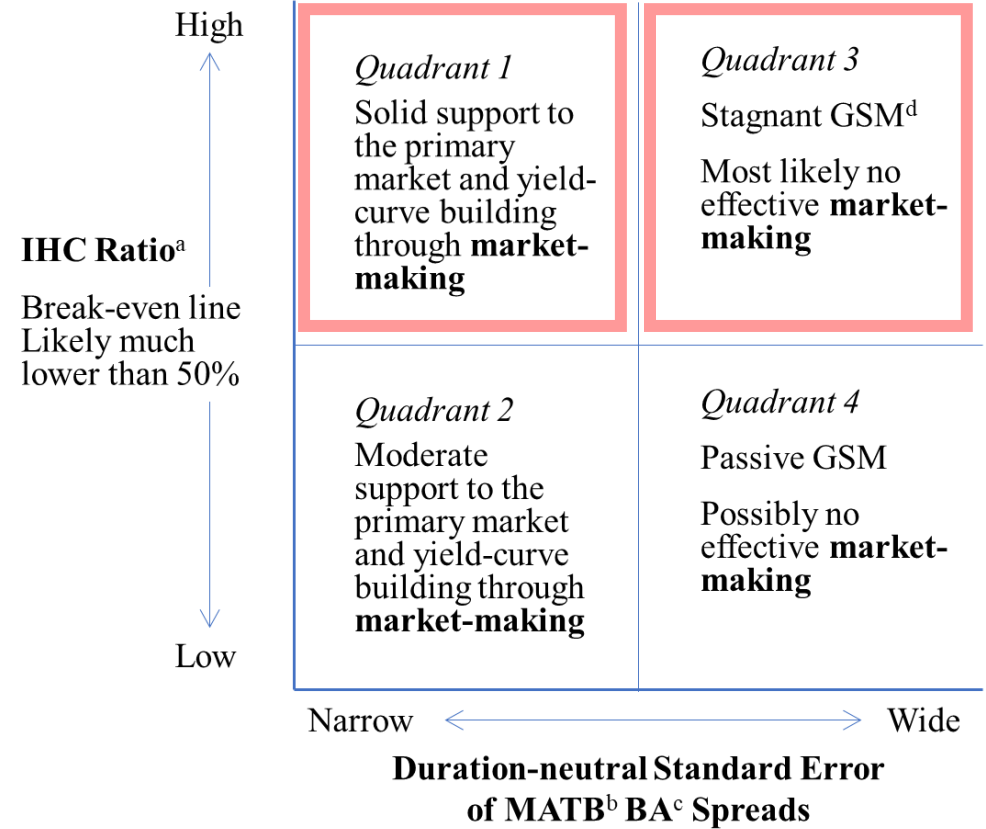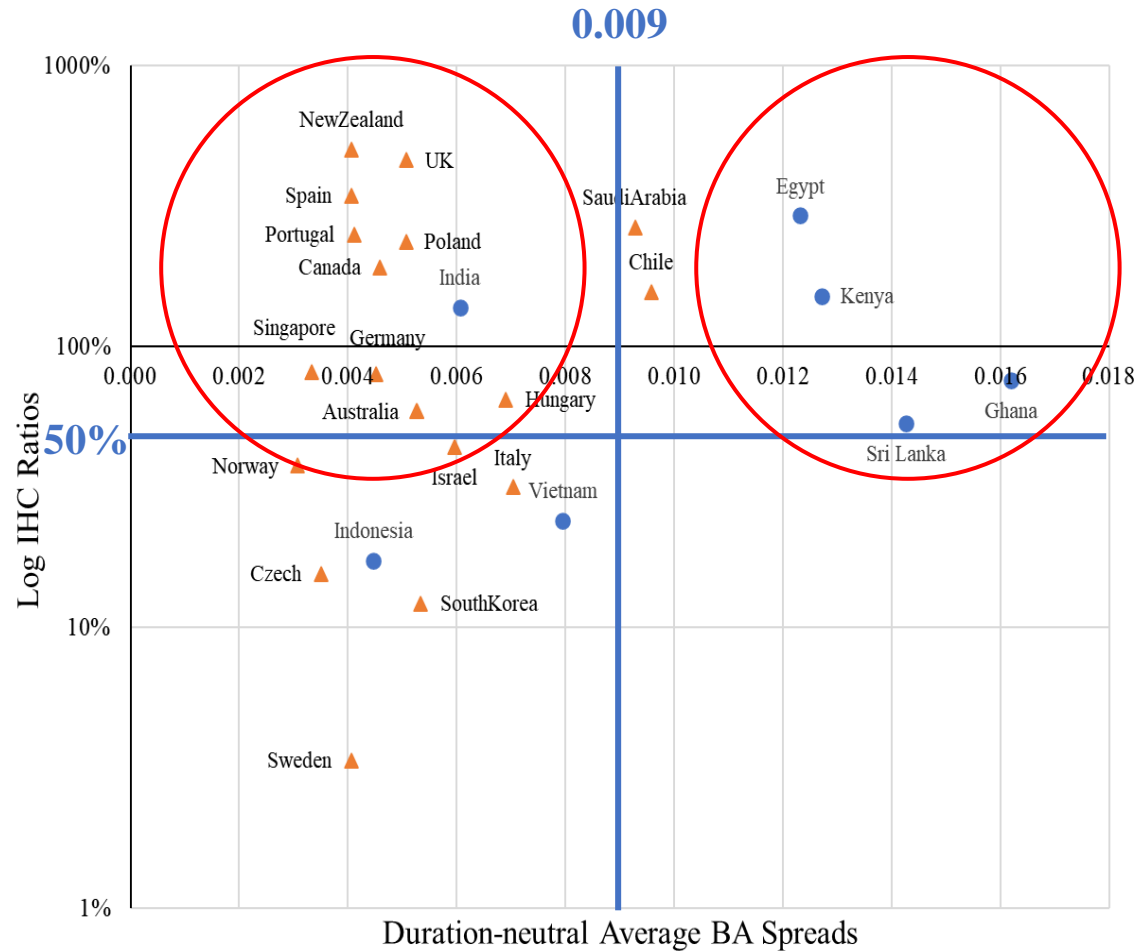- The CPF is less effective for LIE GSMs.

- How can we develop GSMs and improve PDM in LIEs?
  → **Endogenous** Market Development

Conventional Policy Framework

- World Bank and IMF joint initiative since the early 2000s
- Fundamental literature

  - World Bank & IMF. (2001a). *Developing Government Bond Markets: A Handbook*. Washington, DC: World Bank and IMF.
  - World Bank & IMF. (2001b). *Guidelines for Public Debt Management*. Washington, DC: World Bank and IMF.
  - World Bank. (2007a). *Managing Public Debt from Diagnostics to Reform Implementation*. Washington, DC: World Bank.
  - World Bank. (2007b). Developing the Domestic Government Debt Market: From Diagnostics to Reform Implementation. Washington, DC: World Bank.

- Modeled after advanced GSMs in high-income economies (a **gap analysis** approach)
- "**Conflated and muddled**" policy application
- **Blind reliance on: The primary dealer system**

Evidence of Ineffective PD System

Why Is A New Policy Framework Needed?

Conventional programs are effective.

High-income economies (80)

Upper-middle-income economies (55)

Lower-middle-income economies (55)

Low-income economies (27)

37.8%

WB/IMF's CPF
Primary dealership

GSM development has been successful under the CPF? Mostly "No."
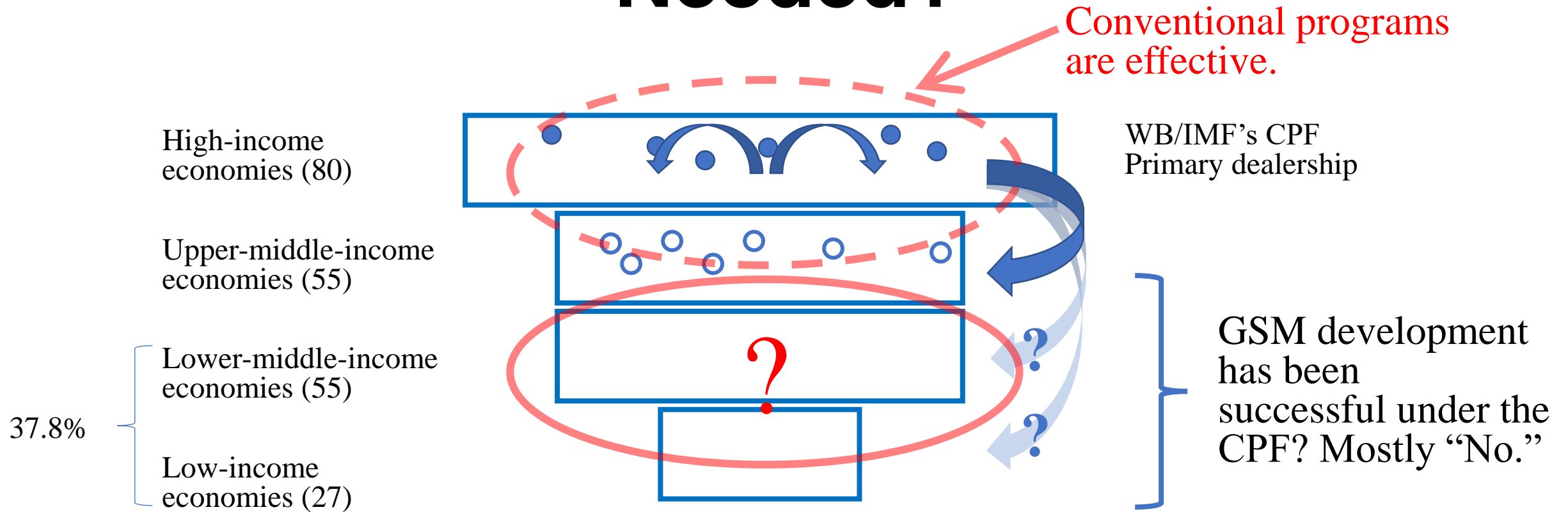
51.5% by population (2020)

Two-Dimensional Market Development

Market Development Phases Matter

Macro-economic conditions & policies

Fiscal conditions & policies

Monetary conditions & policies

Preconditioned

Less preconditioned

to market development policymakers

- The single universe problem
- The indistinction problem
- The incoherence problem
- The stand-alone market component problem

(1) Exogenous Dimension

Inter-phase Shift of Market Structure

(long spans, maybe several years to decades)
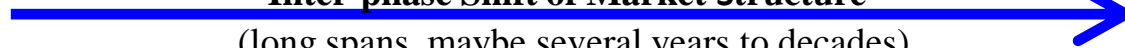
(2) Endogenous Dimension

Intra-phase Improvement of Market Structure

Each phase has its specific market microstructure

Intrinsic Liquidity

Nascent Phase

Evolving Phase

Advanced Phase

Highly-Advanced Phase

Decomposition of Market Development Variables by dimensions
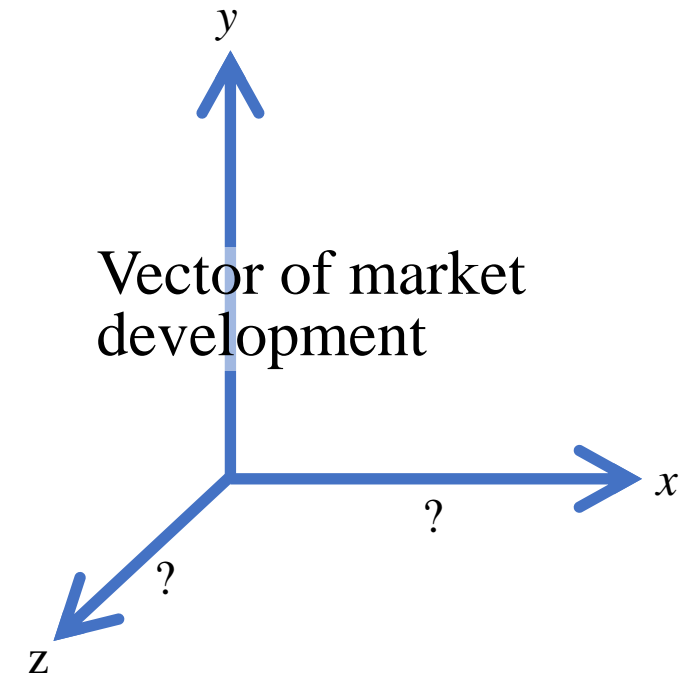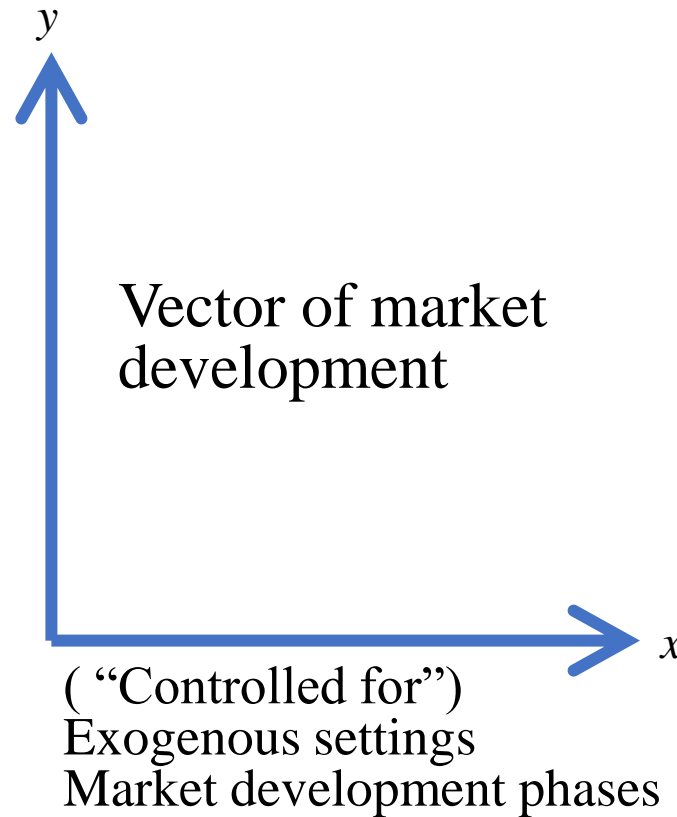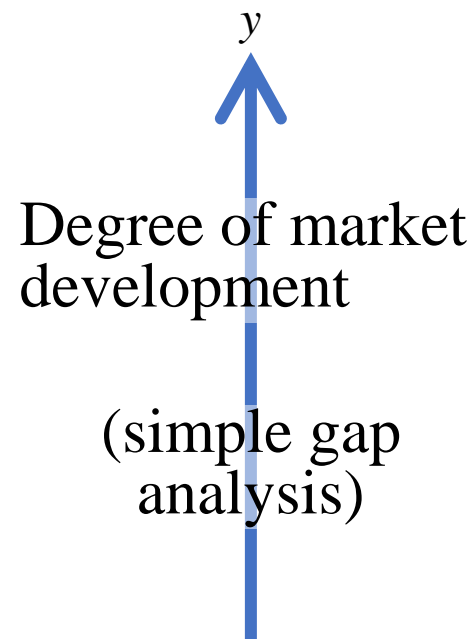
y

Degree of market development

(simple gap analysis)

y

Vector of market development

("Controlled for")
Exogenous settings
Market development phases

x

y

Vector of market development

x

?

?

z

Two-Dimensional Policy Framework

Market Developmental Phases		1 Nascent	2 Evolving	3 Advanced	4 Highly-Advanced
Investor Base			● ●		
Policy Principles	Measures	******	******		****
	Goals	*******	********		
Functioning Market Components					
Accounting	Measures	******	******		○ ****
	Goals	********	********		
Legal affairs	Measures	******	******	****	****
	Goals	******	******	● ○	
Primary market	Measures	******	******	******	****
	Goals	******	******		
Debt & Cash management	Measures	****** ○	●	******	****
	Goals	********			
Secondary market	Measures	******	******	○	******
	Goals	********	********		
Futures & derivatives	Measures	******	******	○	****
	Goals	********	********		
Money market	Measures	******	●		
	Goals	********	********		
Clearing & Settlement	Measures	****** ○	****** ●		
	Goals	********	******		

Reasonably Coherent. Better.

Incoherent. Not Good.

Policy Set

Dynamically Inter-connected Policies

Types of Debt Market Microstructure
for low-cost trading

	Negotiated market (Dealers' club market)	Order-driven market		Quote-driven market	
		Discrete (periodic) auctions (Call market)	**Continuous auctions**	**Partial market-making**	**Full-scale market-making**
Plausible market context	Nascent, occasional trading	Evolving, daily but small volume	Evolving, frequent trading concentrated on a few issues	Advanced, frequent trading diverse across many issues	Highly advanced, frequent trading diverse across many issues
Market making	No	No, but possible	No, but possible	Yes, but opportunistic	Yes
Market structure	Decentralized network	Centrally organized	Centrally organized	Systematically connected network	Systematically connected network
Order matching	Indicative and negotiated	Discretely order-driven	Continuously order-driven	Continuously quote-driven	Continuously quote-driven
Order matching frequency	Continuous	Discrete points in time (for pooling liquidity)	Continuous	Continuous	Continuous
Pre-trade information	Unlikely	Transparent on the order book	Transparent on the limit order book	Electronically likely	Electronically most likely
Post-trade information	Possible by timely reporting and publishing	Transparent	Transparent	Electronic reporting and publishing	Electronic reporting and publishing
Central securities depository	Desirably in place	Most likely in place	In place	In place	In place
Order matching certainty	Low	Very high	High, subject to market conditions	High across traded issues, subject to market conditions	Very high across traded issues
Price volatility	Maybe high	Low	High when low-liquidity	Low	Low
Order matching immediacy	Low	Low	High, subject to market conditions	High, subject to liquidity	Very high, subject to liquidity
Government's market risk mitigating facility	No	No	No	Desirable	Essential
Securities lending	Highly limited, if any	Limited, if any	Desirable	Highly desirable	Essential
Master repo agreement	Unlikely	Desirable	Desirable	Highly desirable	Essential
Reopening or switching	Difficult	May be possible	Possible	Highly possible	Active
Interest rate swap	Highly unlikely	Unlikely	Possible	Highly possible	Active
Interdealer broker	No need	No need	No need	Unlikely	Maybe needed
Remark		Maybe set up on a stock exchange platform			

Endogenous variables' Contributions
to GSM Development – India's case (2005-2019)

Critical effects of **endogenous variables** on market development have been **overlooked**. However, my research found that

- The observed variables **explained** approx. 50% of trade volumes. Purely endogenous variables explained approx. 40%, and
- The GSM policymaker could manage **this 40-50%** of trade volume changes through **endogenous variables** (phase-fit market component).

Independent variables controlling for:	Trade volume changes contributed by	R-squared	
		1st half	2nd half
No control		0.5107	0.4876
	G-sec balance	0.1085	0.0663
G-sec balance		**0.4022**	**0.4213**
	NDS-OM trading	0.2208	0.1649
G-sec balance and NDS-OM trading		0.1814	0.2564

Impact of Endogenous Factors

Exogenous factors	Endogenous factors Managerable/controllable	GSM development likelihood
	Development contribution	
50%	50%	
Favorable	**Favorably**	Most likely	**100%**
	Unfavorably	Likely	50%
Neutral	**Favorably**	Likely	**50%**
	Unfavorably	Less likely	0-20%
Unfavorable	Favorably	Less likely	0-20%
	Unfavorably	Unlikely	0%

Market Structure's Life Cycle & Transition

**Phases 2, 3 & 4
Market Structure Life Cycle**

Utility weight

Trade volume
per unit-time

Utility weight in
trade decision

**Utility-
seeking**

A network effect increasing
liquidity (order-matching)
counter-balances
congestion's negative effect

Phase transition
Scale-up needs

A utility bundle
embedded in a
new market
structure

Resistance from the
market structure's
Carrying capacity

A New
Market
Structure

Phase-in

New
Market microstructure,
Technologies &
Business models

Phase-out / **Inertia Period**

Critical Mass
for self-
sustaining

- complacence,
- status quo bias,
- complexity, and
- vested interest.
→ Consensus building
for a way-out

Early adopters
use the new
market structure.

Trade volume
per unit-time

Price-taking
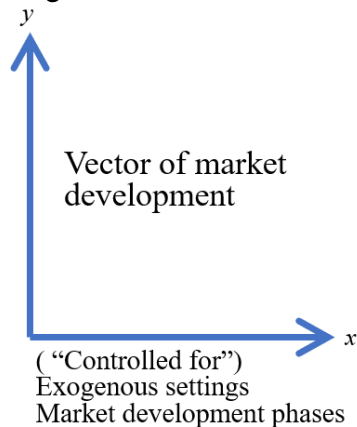
Utility level
Time

- **A utility bundle** embedded in a market structure.

- Utility weight in trading decision

- "Early adopters"
  → "early majority"
  → "late majority"
  → "laggers"

- Liquidity/Network feedback effect.

- **Utility seeking**
  → Price taking

- Resistance from the market structure's **carrying capacity.**

Conclusion
Efficiency in Imperfect Markets

When we develop GSMs in LIEs, remember:

(1) A two-dimensional policy framework

y

Vector of market development

("Controlled for")
Exogenous settings
Market development phases

x

- Phase-differentiation
- Phase-consistency
- Manageable for policy makers

(2) Interconnected policies

- Incremental
- Gradual
- Transtemporal (path-dependent)
- Comprehensive

(3) Utilities driving trading in early-stage markets.

Utilities
- The trader's or the investor's preference
- Non-monetary or psychological values, such as reliability, functionality, convenience
- Usually not objectively measurable.