# Spillover Effects of Infrastructure, Desired Exchange Rate System and Aging Economy

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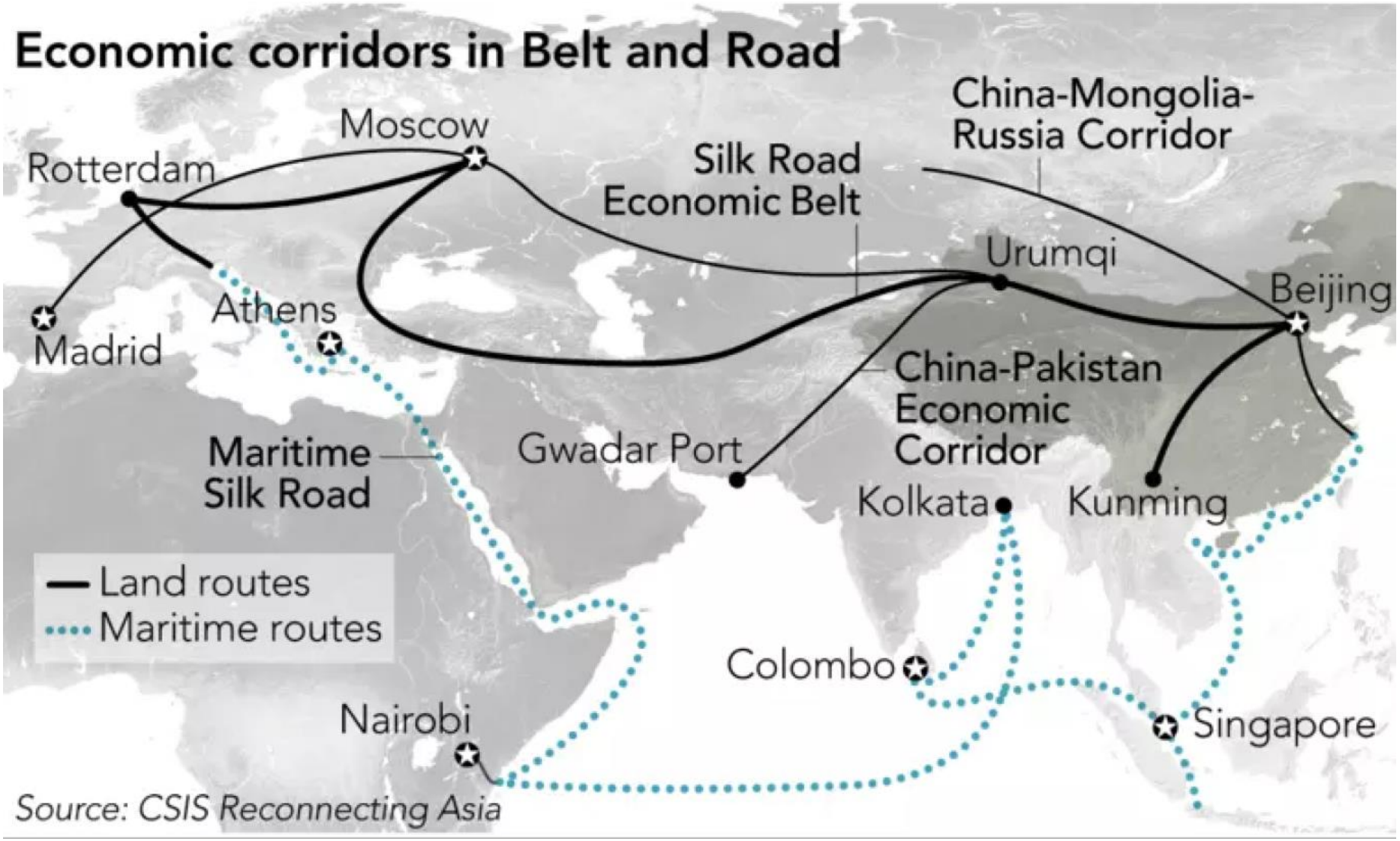

Economic corridors in Belt and Road
China-Mongolia-Russia Corridor
Moscow
Rotterdam
Silk Road Economic Belt
Urumqi
Beijing
Athens
Madrid
China-Pakistan Economic Corridor
Maritime Silk Road
Gwadar Port
Kolkata
Kunming
Land routes
Maritime routes
Colombo
Nairobi
Singapore
Source: CSIS Reconnecting Asia

# Infrastructure Investment Needs in Asia-Pacific (2016-2030)

($ billion in 2015 prices, annual average)

| | Baseline Total | % of GDP | Climate Adjusted | % of GDP |
|---|---|---|---|---|
| **Central Asia** | 33 | 6.8 | 38 | 7.8 |
| **East Asia** | 919 | 4.5 | 1071 | 5.2 |
| **South Asia** | 365 | 7.6 | 423 | 8.8 |
| **Southeast Asia** | 184 | 5.0 | 210 | 5.7 |
| **The Pacific** | 2.8 | 8.2 | 3.1 | 9.1 |
| **Asia & Pacific** | 1503 | 5.1 | 1744 | 5.9 |

Source: Meeting Asia's Infrastructure Needs, ADB (2017)

# Private Finance for Infrastructure

1, **Banks --- Safer projects and shorter term**

- Brown field (infrastructure)
- Invest into operation period
- Securitization after certain period of time
- Privatized projects by the government

2, **Insurance and Pension funds (Long term)**

- Long term projects (10 years –20- 30 years)

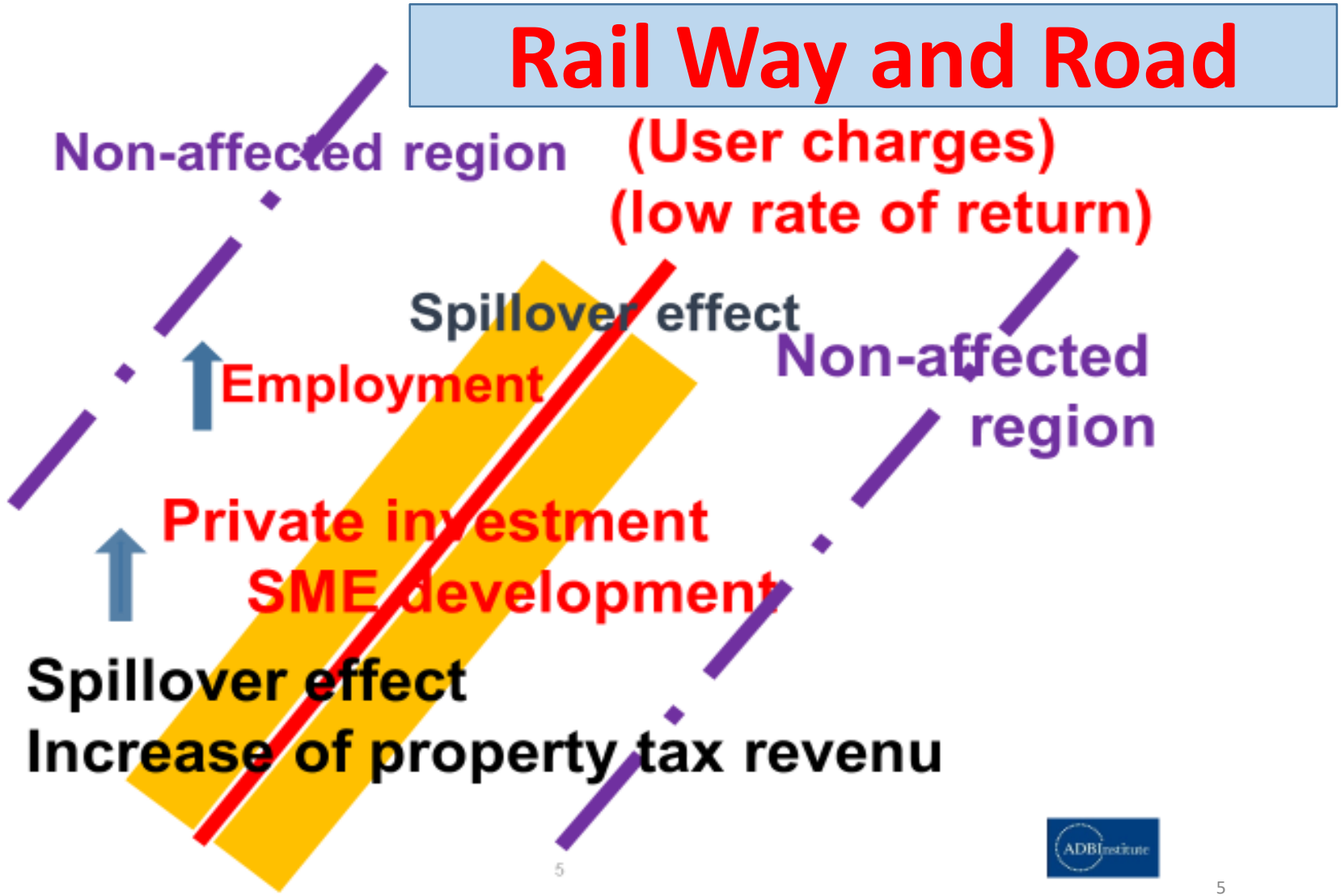
3, **Infrastructure Bonds (revenue bond)**

- uncertain income streams

4, **Equity Investments in Infratructure**

- Construction period and Green fields

# Spillover Effects of Infrastructure Investment



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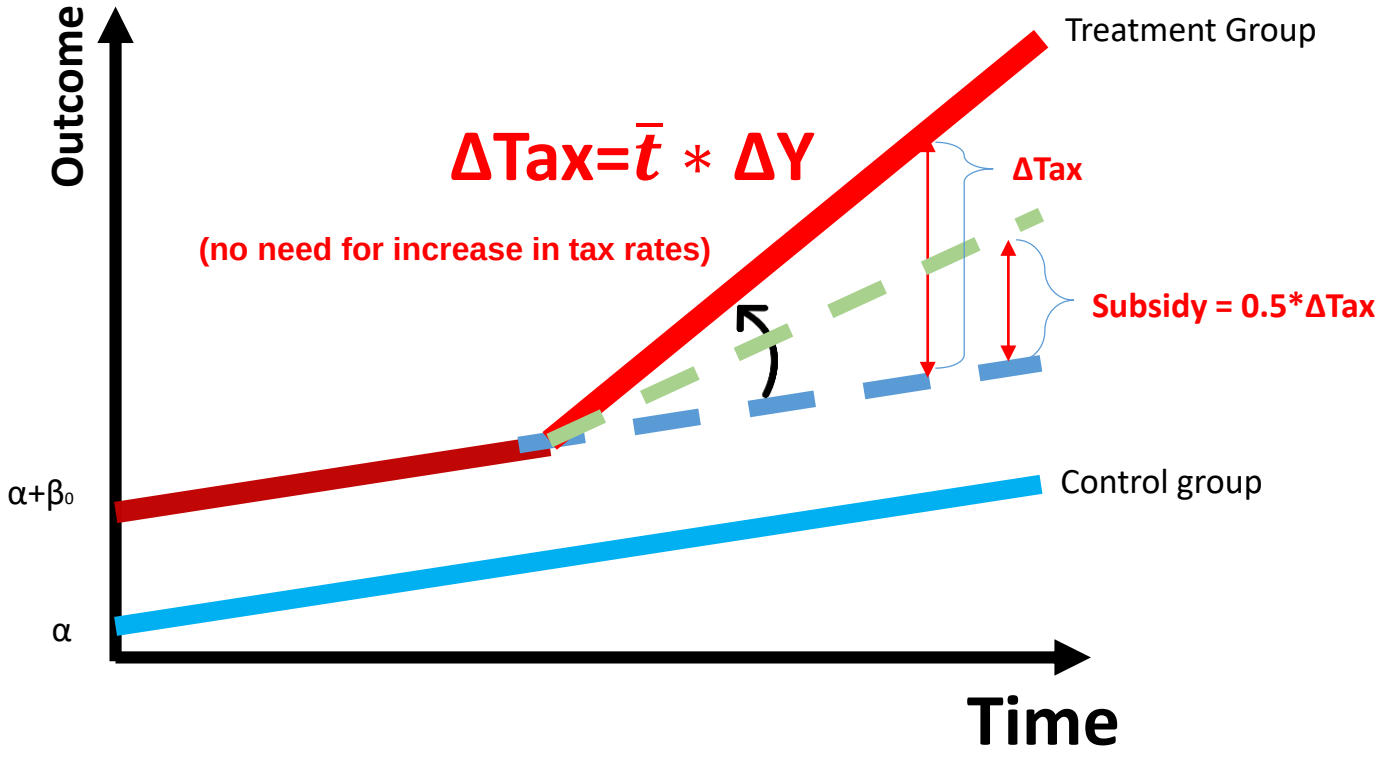
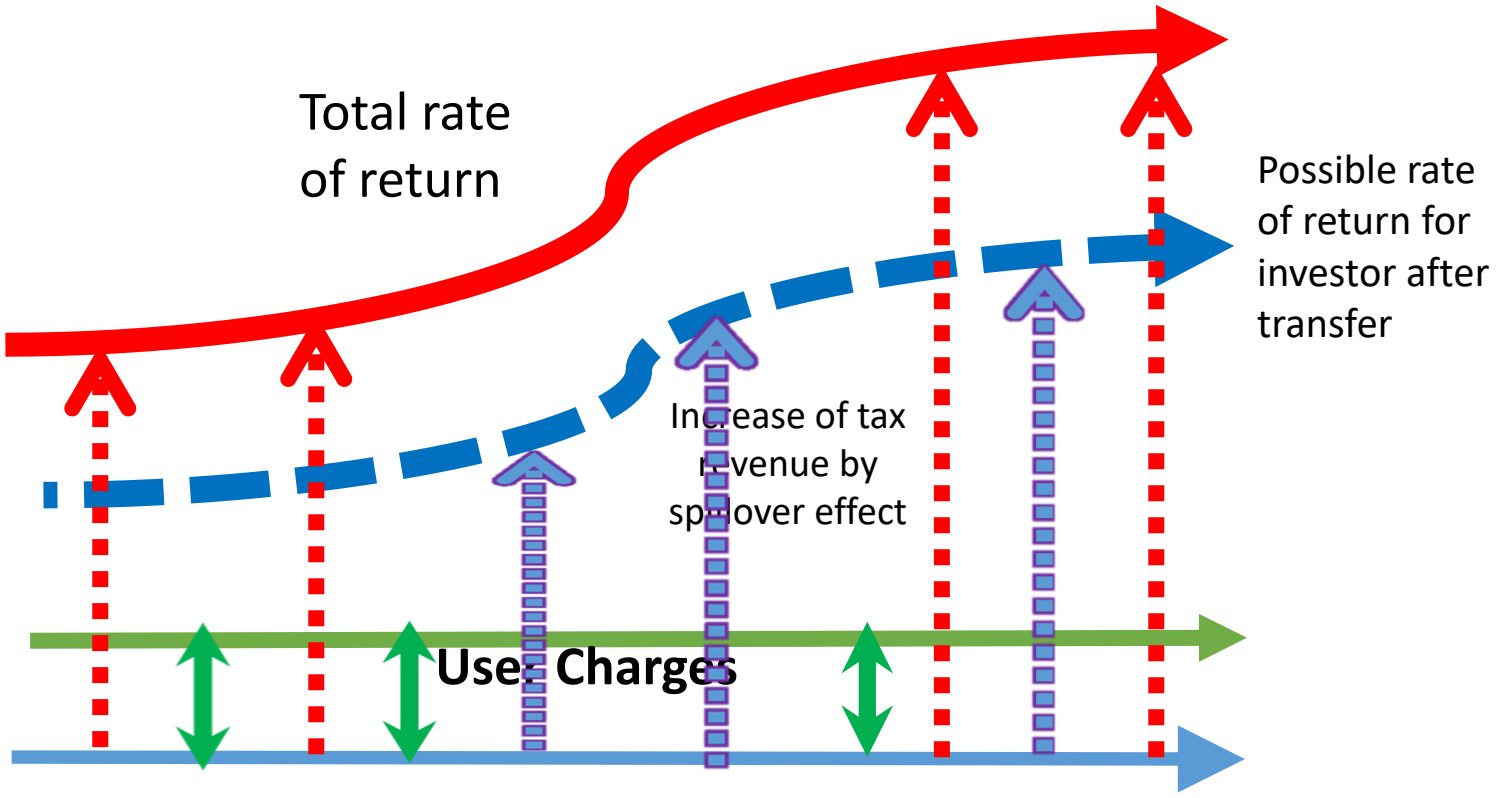
# Concept of subsidy based on additional flow of tax revenue due to infrastructure



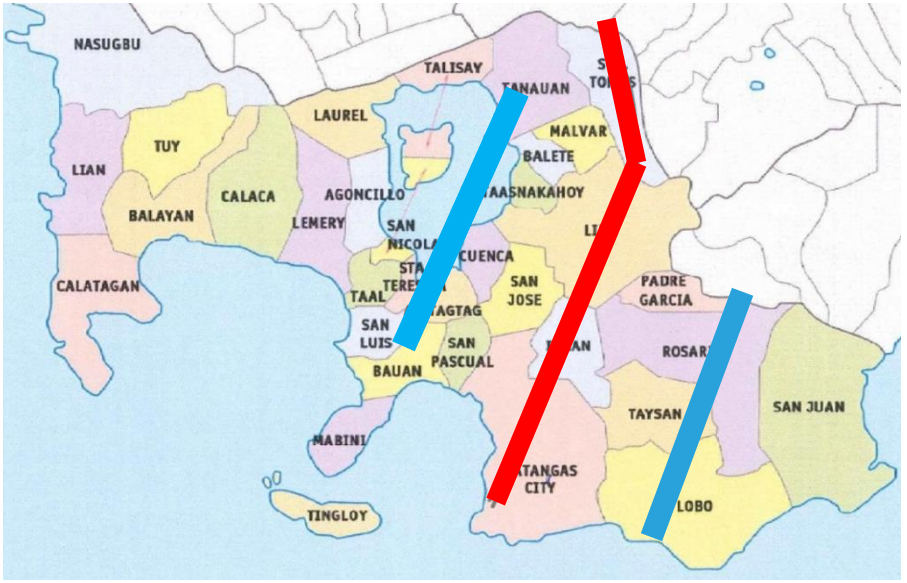

$$Outcome = \alpha + \beta_0 D_i + \sum_{t=1}^{N} \beta_0 * D_i * T_t + \varepsilon_{i,t}$$

# Injection of Increased Tax Revenues to Increase the Rate of Return



# Southern Tagalog Arterial Road (STAR) Philippines (Yoshino and Pontines, Chapter 3)

- STAR tollway built to improve road linkage between Metro Manila and Batangas International Port.
- Tax revenue increased during construction and after completion in communes along the tollway.




| | $t_{-2}$ | $t_{-1}$ | $t_0$ | $t_{+1}$ | $t_{+2}$ | $t_{+3}$ | $t_{+4}$, forward |
|---|---|---|---|---|---|---|---|
| Lipa City | 134.36 | 173.50 | 249.70 | 184.47 | 191.81 | 257.35 | 371.93 |
| Ibaan City | 5.84 | 7.04 | 7.97 | 6.80 | 5.46 | 10.05 | 12.94 |
| Batangas City | 490.90 | 622.65 | 652.83 | 637.89 | 599.49 | 742.28 | 1,208.61 |

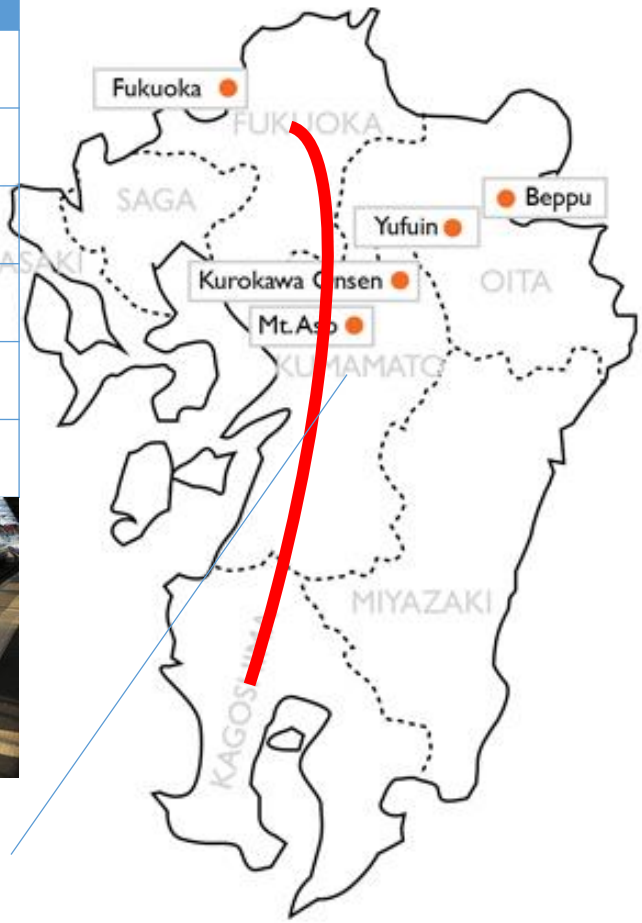
(Yoshino and Abidhadjaev, Chapter 2)

# Context: Japan

| Travel time to Kagoshima | | |
|---|---|---|
| | **Before** | **After** |
| Tokyo | 9h 00m | 7h 20m |
| Shin-Osaka | 6h 20m | 4h 40m |
| Hakata | 3h 50m | 2h 10m |
| Kumamoto | 2h 30m | 1h 00m |
| Shin-Yatsushiro | 2h 10m | 35m |

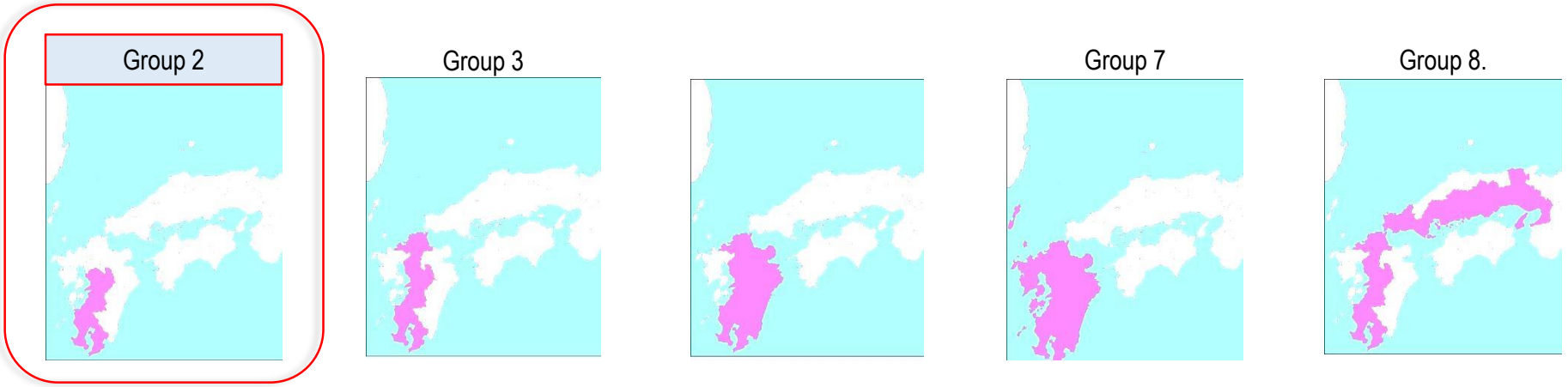
**Kyushu Shinkansen**

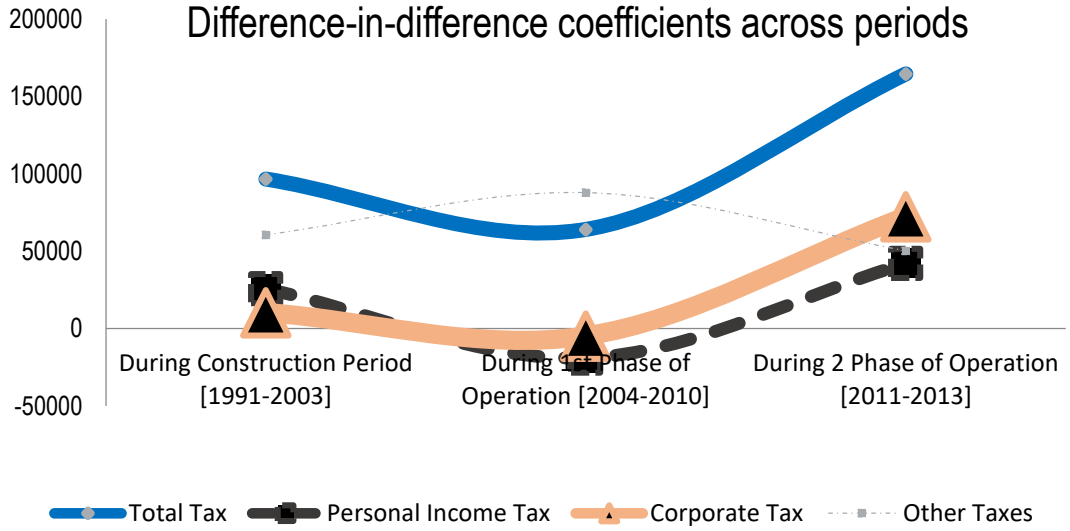
Japan




Source: https://www.acprail.com/rail-passes/japan-rail/bullet-train/kyushu-shinkansen

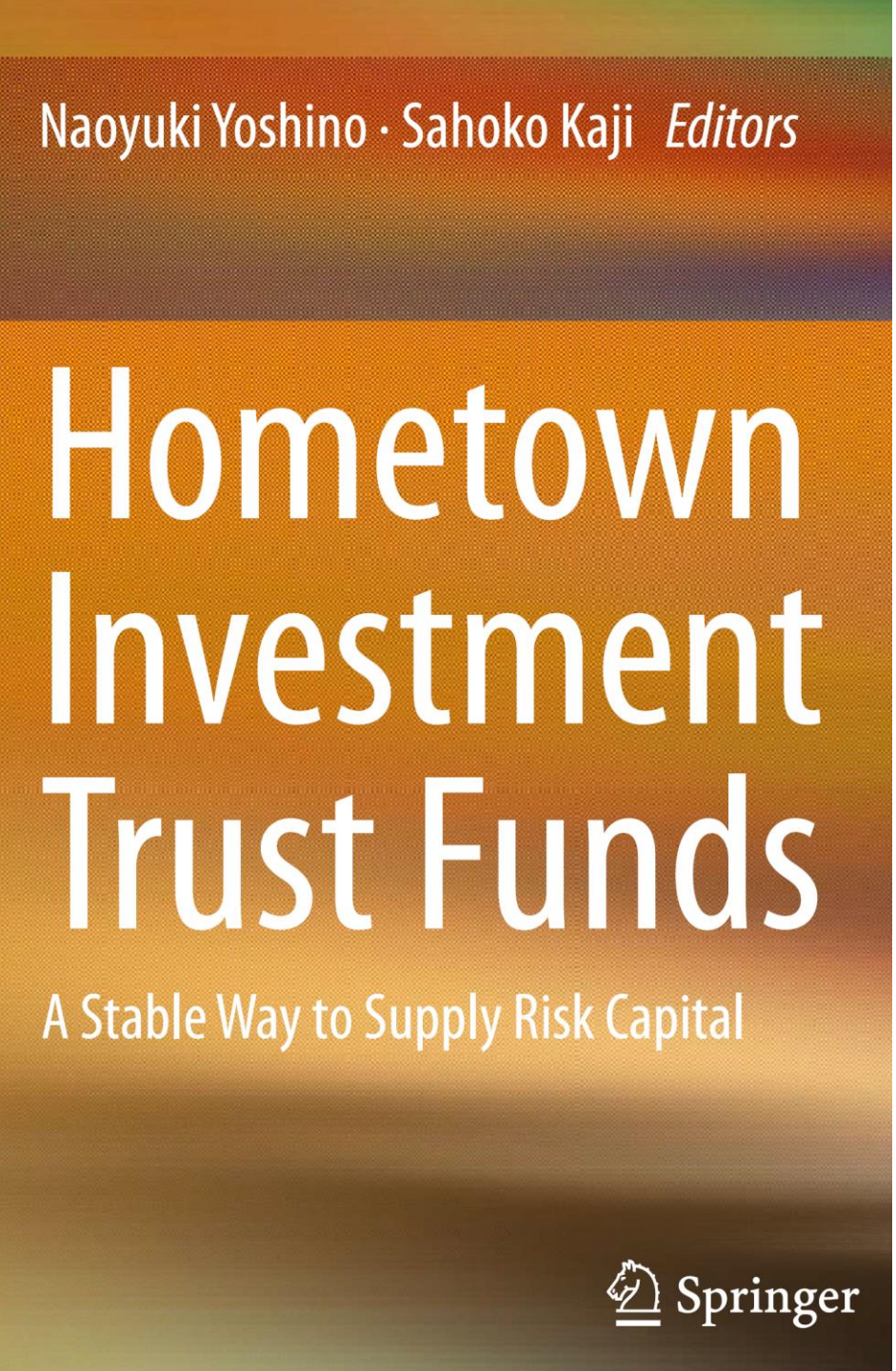
# Estimation Results by Group of Prefectures




Impact took place during construction, decreased during operation of segmented(autonomous) rail line and bounced back after connection to greater rail system

**Note**: Numbers for tax revenue amount adjusted for CPI with base year 1982. Pre-shinkansen construction period covers years from 1982 to 1990. Non-affected groups include rest of the prefectures. Treated groups:
Group 2: Kagoshima, Kumamoto
Group 3: Kagoshima, Kumamoto, Fukuoka
Group 5: Kagoshima, Kumamoto, Fukuoka, Oita, Miyazaki
Group 7: Kagoshima, Kumamoto, Fukuoka, Oita, Miyazaki, Saga, Nagasaki
Group Con.: Kagoshima, Kumamoto, Fukuoka, Yamaguchi, Hiroshima, Okayama, Hyogo, Osaka




**Hometown Investment Trust Funds : Springer**

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A Stable Way to Supply Risk Capital

Yoshino, Naoyuki; Kaji Sahoko (Eds.) 2013,

**Japan, Cambodia Vietnam, Peru, Mongolia**

**Access to Digital Technology, Internet**

Springer


Source: Music – Securities Home Page

# Financing for Start-ups along Roads (Hometown crowd funding)

**Source:**
**Music Securities—Home page**

# Infrastructure & Education

## Yoshino and Umid Abidhadjaev (2016)

### Education

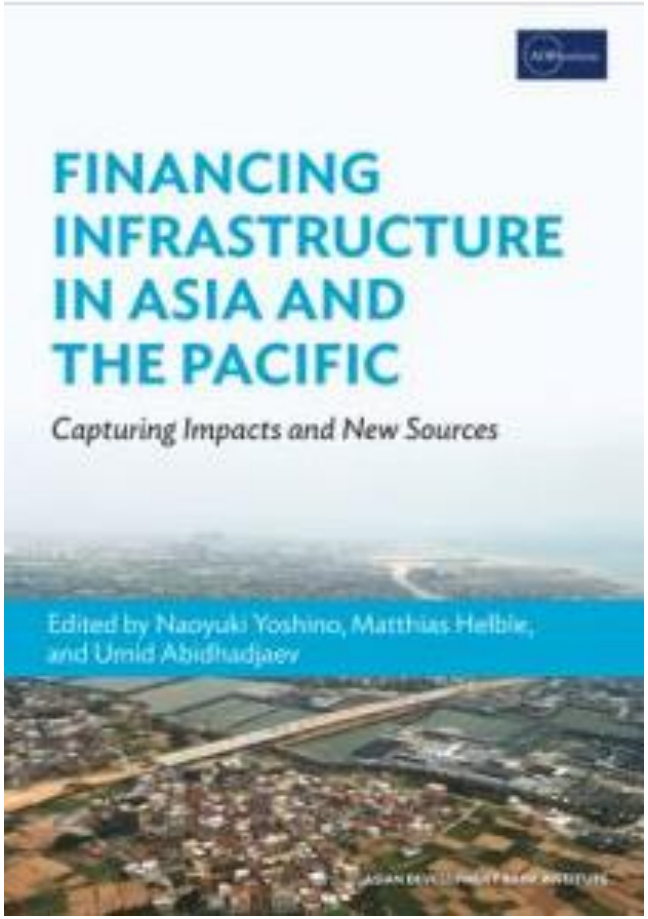
In a study of 44 companies, Professor Yoshino found that education played a significant role in impacting the quantum of the spillover effect. Secondary schools provided basic skills for blue collar workers. Universities provided education for highly skilled workers. Workers' education level impacted businesses' productivity.

| Dependent variable: log difference GDP per capita in 1991-2010 | | | |
|---|---|---|---|
| Regression number | REG.1 | REG.2 | REG.3 |
| Variables | Coef. | Coef. | Coef. |
| lnY_1991 | -0.06 | -0.14 | -0.14 |
| | (-0.54) | (-1.35) | (-1.38) |
| ln(n+g+d) | -3.09 | -5.75 | -4.36 |
| | (-0.59) | (-1.23) | (-0.77) |
| ln(Kg) | 0.23 | 0.31 | 0.53 |
| | (1.17) | (2.00) | (3.30) |
| ln(Sec) | | | 0.00 |
| | | | (0.46) |
| ln(Kg)xln(Sec) | 0.20 | | |
| | (1.59) | | |
| ln(Uni) | | | 0.21 |
| | | | (2.07) |
| ln(Kg)xln(Uni) | | 0.24 | |
| | | (2.76) | |
| Constant | -0.28 | 0.56 | 0.48 |
| | (-0.33) | (0.69) | (0.57) |
| | | | |
| Number of observations | 44.00 | 44.00 | 44.00 |
| R-squared | 0.21 | 0.30 | 0.30 |
| F-statistic | 2.62 | 4.14 | 3.29 |

# New Book on Infrastructure

- "FINANCING INFRASTRUCTURE
- IN ASIA AND THE PACIFIC:
- Capturing Impacts and New Sources"

- Edited by Naoyuki Yoshino, Matthias Helble, and Umid Abidhadjaev
  - the latest evidence on the impact of infrastructure investment on economic and social indicators
  - country studies on how infrastructure investment can increase output, taxes, trade and firm productivity
  - innovative modes of infrastructure financing
  - DOWNLOAD FOR FREE: https://www.adb.org/publications/financing-infrastructure-asia-capturing-impacts-and-new-sources



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China & World Economy

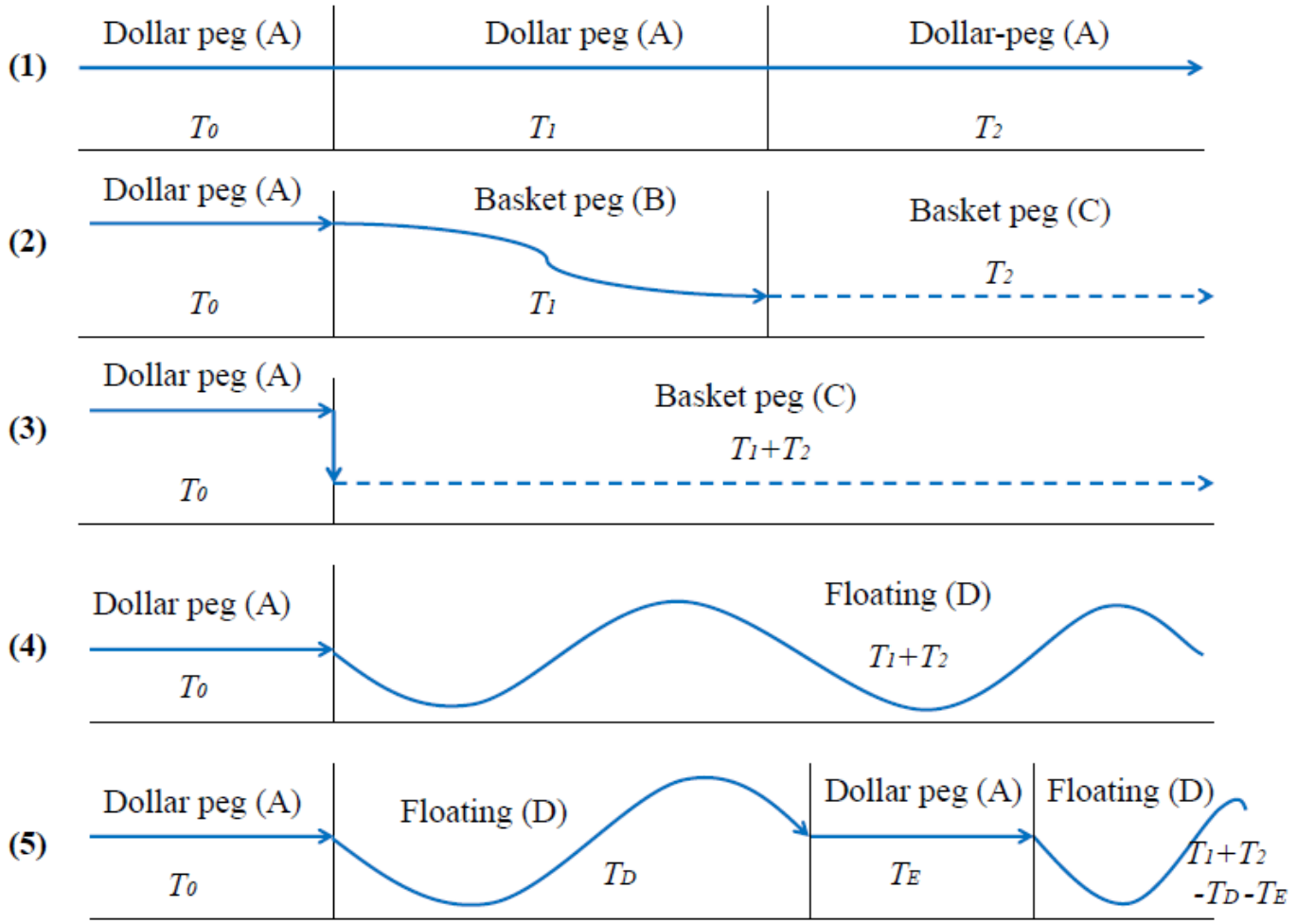
*China & World Economy / 36–55, Vol. 22, No. 3, 2014*

# Dynamic Transition of Exchange Rate Regime in China

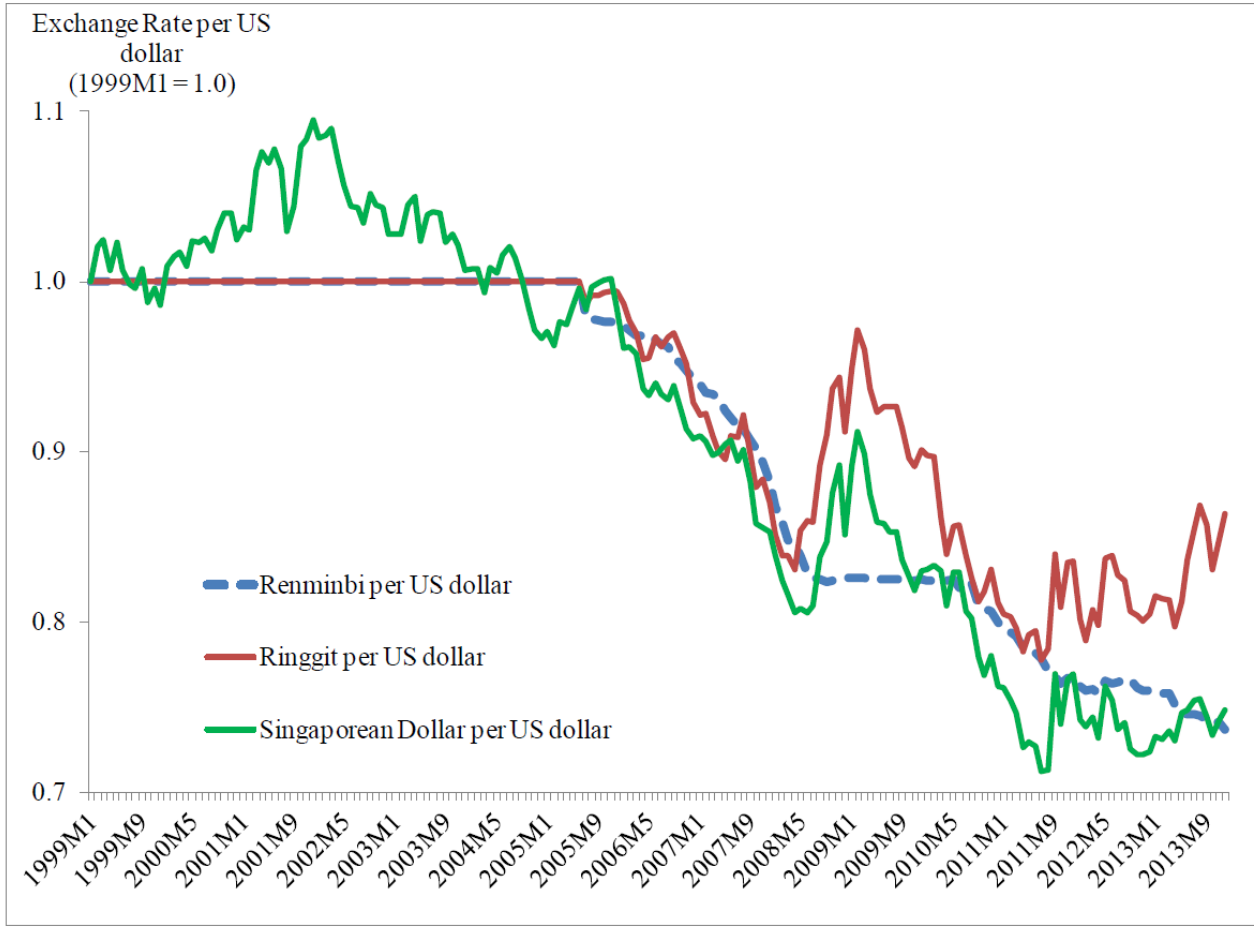
*Naoyuki Yoshino, Sahoko Kaji, Tamon Asonuma**

# Analysis on Dynamic Transition (China)

- Policies toward Stable Regimes
- $L(T_0, T_1, T_2) = \sum_{t=1}^{T_0+T_1+T_2} \beta^{t-1} (y_t - \bar{y}')^2$



## Figure 1. Nominal Exchange Rates Against the US Dollar




Source: IMF International Financial Statistics.

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Journal of Asian Economics

Full length article

# Exchange rate regime switching in Malaysia and Singapore in response to China's move to a basket peg: A DSGE analysis☆

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**(1) Gradual Change in Capital Opening**

**(2) Develop China's Financial Market**

**(3) Dynamic Basket Currency System**

# Thank you so much for your attention

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**Asian Development Bank Institute (ADBI)**