Global Economic Prospects

Spillovers amid Weak Growth

by M. Ayhan Kose

Comments

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Business Cycle Theory
boom period and recession

1. Easy Monetary Policy
   Too much Liquidity $\rightarrow$ Commodities’ market $\rightarrow$ Commodity Price increase

2. Decline in Aggregate Demand?
   Role of Fiscal Policy

3. Aggregate Supply policies require longer time periods

4. Global capital flows $\rightarrow$ Quick contagion to other regions

5. Capital flow control

6. Exchange rate policy
1. Structural reforms required in China
   (1) Central-Local government relations
   (2) Shadow banks and financial regulation,
       Deposit Insurance and Un-protected financial products
   (3) Central bank’s monetary policy
   (4) Exchange rate system in China
   (5) Capital flow liberalization
   (6) Financial sector de-regulation
   (7) Hidden defaults of SOE (State Owned Enterprises)
Growth of ASEAN countries and India

1. Slow growth of China might be compensated by growth of ASEAN and India

2. Financial Sector Development in Asia
   (i) Lack of long-term investors (Pension funds and insurance)
   (ii) Venture capital market is not developed
   (iii) Hometown Investment Trust to finance startups and SMEs
   (iv) Financial Regulation and supervision

3. Capital flow control

4. Lack of infrastructure investment in Asian countries (water supply and sanitation)

China → Domestic Consumption and Domestic Demands might compensate decline in exports

China’s overcapacity can be used for infrastructure investments by AIIB
Decline in Oil Prices and Other Commodity Prices Benefit to Oil Consuming Countries

Figure 10. Effect of Lower Oil Prices on the Price Level

Lower intercept for the price level so lower target for the inflation
Geo-political Risks caused by lower oil price

1. Too much reliance on oil will lead to risks
   - Long term trend of oil price
   - Green energy such as solar power, wind power, hydro power etc.

2. Income disparities are increasing in some Asian countries
   - Proper tax structure has to be reconsidered
   - Tax compliance, progressive tax system

3. Human capital development
   - Education and vocational training

4. How to provide money to startups and create new innovation
Problem of Vertical IS Curve

Table 3. Empirical Results
(Sample: Q2 1990–Q4 2013)

\[ y_t = -0.16 - 0.0002(i - E\Delta p_{t+1}) + 1.01y_{t-1} \]

(IS equation-1)

\[ R^2 = 0.99 \text{ adjusted } R^2 = 0.99 \text{ Durbin-Watson Statistic } = 1.70 \text{ Standard Error of regression } = 0.01 \]

\[ y_t = -0.15 + 0.0002(i - E\Delta p_{t+1}) + 1.01y_{t-1} \]

(IS equation-2)

\[ R^2 = 0.99 \text{ adjusted } R^2 = 0.99 \text{ Durbin-Watson Statistic } = -1.62 \text{ Standard Error of regression } = 0.01 \]

\[ (m - p)_t = 0.02 + 0.70y_t - 0.025\bar{y_t} + 0.99(m - p)_{t-1} \]

(LM equation)

\[ R^2 = 0.99 \text{ adjusted } R^2 = 0.99 \text{ Durbin-Watson Statistic } = 1.93 \text{ Standard Error of regression } = 0.03 \]
How to promote MSMEs and Startups?

Hometown Investment Trust Funds
for startup businesses to sell their products

- Safer Borrower
- Riskier Borrower
- Banking Account
- Hometown Investment Funds
- Depositors
- Investors
Investment in start up businesses and SMEs
Purchase type and Investment type
Agricultural Funds

Beans and Wine
Financial Scheme of Wind Power by Hometown Trust Fund

- **Donation**
- **Investors**
  - 100 US$
  - 300 US$
- **Hokkaido Green Fund (60%)**
- **Senior Bank Loans (20%)**
- **Government Fund by Carbon Tax (20%)**
- **Sell to Power Company**
- **Final User**
  - Sales Of Power (1+0.05)

Selling to Power Company and government fund by carbon tax for 20% returns.
Production Function: \[ Y = F( Kp, L, Kg ) \]

Output

Direct Effect

Y = Output, Kp = private capital, L = labor
Kg = public capital (infrastructure)
Return the spillover effects to Investors

The production technology of the private sector is represented by the following production function.

\[ Y = f(K_p, L, K_G) \]  

where \( Y \) denotes output (in value added) in the private sector. The output is produced by combining private capital stock, \( K_p \), labor input, \( L \), and infrastructure stock, \( K_G \).

In this paper, we assume the translog production function.

\[
\ln Y = \alpha_0 + \alpha_K \ln K_p + \alpha_L \ln L + \alpha_G \ln K_G \\
+ \beta_{KL} (1/2)(\ln K_p)^2 + \beta_{KL} \ln K_p \ln L + \beta_{KG} \ln K_p \ln K_G \\
+ \beta_{LL} (1/2)(\ln L)^2 + \beta_{LG} \ln L \ln K_G + \beta_{GG} (1/2)(\ln K_G)^2
\]  

Assuming the production function represented by equation (1), and that factor prices and infrastructure are given for producers in the private sector, the effect of infrastructure on productivity is expressed as:

\[
\frac{dY}{dK_G} = \frac{\partial Y}{\partial K_G} + \frac{\partial Y}{\partial K_p} \frac{\partial K_p}{\partial K_G} + \frac{\partial Y}{\partial L} \frac{\partial L}{\partial K_G} \]  

(9)

Here, the effect of infrastructure is divided into three parts; the first term on the right hand side of equation (9) represents direct effect; the second term is the indirect effect on output with respect to the resulting change in the input of private capital and the third term is the indirect effect on output with respect to the resulting effect on labor input.
Highway

Non-affected region

Non-affected region

Private investment

Employment

Spillover effect

Spillover effect
## Spillover effects ➔ Return to investors

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Direct Effect (Kg)</strong></td>
<td>0.696</td>
<td>0.737</td>
<td>0.638</td>
<td>0.508</td>
<td>0.359</td>
<td>0.275</td>
</tr>
<tr>
<td><strong>Indirect Effect (Kp)</strong></td>
<td>0.453</td>
<td>0.553</td>
<td>0.488</td>
<td>0.418</td>
<td>0.304</td>
<td>0.226</td>
</tr>
<tr>
<td><strong>Indirect Effect (L)</strong></td>
<td>1.071</td>
<td>0.907</td>
<td>0.740</td>
<td>0.580</td>
<td>0.407</td>
<td>0.317</td>
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<tr>
<td><strong>20% Returned</strong></td>
<td>0.3048</td>
<td>0.292</td>
<td>0.2456</td>
<td>0.1996</td>
<td>0.1422</td>
<td>0.1086</td>
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<tr>
<td><strong>% Increment</strong></td>
<td>43.8</td>
<td>39.6</td>
<td>38.5</td>
<td>39.3</td>
<td>39.6</td>
<td>39.5</td>
</tr>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>0.215</td>
<td>0.181</td>
<td>0.135</td>
<td>0.114</td>
<td>0.108</td>
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</tr>
<tr>
<td>0.195</td>
<td>0.162</td>
<td>0.122</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
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<tr>
<td>0.193</td>
<td>0.155</td>
<td>0.105</td>
<td>0.09</td>
<td>0.085</td>
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<tr>
<td>0.0776</td>
<td>0.0634</td>
<td>0.0454</td>
<td>0.038</td>
<td>0.037</td>
<td></td>
</tr>
<tr>
<td><strong>36.1</strong></td>
<td><strong>35.0</strong></td>
<td><strong>33.6</strong></td>
<td><strong>33.3</strong></td>
<td><strong>34.3</strong></td>
<td></td>
</tr>
</tbody>
</table>
The Southern Tagalog Arterial Road (STAR) project in Batangas province, Philippines (south of Metro Manila) is a modified Built-Operate-Transfer (BOT) project.

The 41.9 km STAR tollway was built to improve road linkage between Metro Manila and Batangas City, provide easy access to the Batangas International Port, and thereby accelerate industrial development in Batangas and nearby provinces.
The Southern Tagalog Arterial Road (STAR Highway), Philippines, Manila

Tax Revenues in three cities

Yoshino and Pontines (2015) ADBI Discussion paper 549

表 8 フィリピンの STAR 高速道路の影響のない地域と比較した事業税の増加額

（単位：100万ペソ）

<table>
<thead>
<tr>
<th></th>
<th>$t_{-2}$</th>
<th>$t_{-1}$</th>
<th>$t_0$</th>
<th>$t_{+1}$</th>
<th>$t_{+2}$</th>
<th>$t_{+3}$</th>
<th>$t_{+4}$以降</th>
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<tbody>
<tr>
<td>Lipa 市</td>
<td>134.36</td>
<td>173.50</td>
<td>249.70</td>
<td>184.47</td>
<td>191.81</td>
<td>257.35</td>
<td>371.93</td>
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<tr>
<td>Ibaan 市</td>
<td>5.84</td>
<td>7.04</td>
<td>7.97</td>
<td>6.80</td>
<td>5.46</td>
<td>10.05</td>
<td>12.94</td>
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<tr>
<td>Batangas 市</td>
<td>490.90</td>
<td>622.65</td>
<td>652.83</td>
<td>637.89</td>
<td>599.49</td>
<td>742.28</td>
<td>1208.61</td>
</tr>
</tbody>
</table>

（出所）Yoshino and Pontines (2015)より筆者作成
Private investment

Spillover effect

→ Increase in Tax revenues

Toll fees
Ticket revenue → Investors

Fees + Additional return from tax revenues

→ Increase rate of return on investment

Employment

Spillover effect

→ Increase in Tax revenues
Public Private Partnership

- Toll Revenues From Highway (70%) + Injection of Tax Revenues (30%)
- Return to Private Funds
- Increase of Tax revenues by spillover
- Return to Privates Funds (30% Increase of Rate of Return)
Cross-border Infrastructure Investment
Role of Multilateral Institution

Country A
Large City

Country B
Spillover effect, Promote SMEs

Spillover effect
→ Increase in Tax revenues
Uzbekistan Railway

GDP growth rate

\[ Y_{\text{control, before}} \]
\[ Y_{\text{treatment, before}} \]

Divide regions affected and not affected by railway connection to “Treated group” and “Control group”
### Additional tax revenue, Regional GDP growth and Railway Company Net Income, LCU (bln.)

<table>
<thead>
<tr>
<th>Period</th>
<th>Coefficients</th>
<th>$T(20) \Delta Y$ (Tax revenue)</th>
<th>$\Delta Y$ Affected (Direct + Spillover effects)</th>
<th>Company net income (Revenue - Costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short term</td>
<td>2.83***</td>
<td>16.0</td>
<td>79.9</td>
<td>315.5</td>
</tr>
<tr>
<td>(2009-2010)</td>
<td>[4.48]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-term</td>
<td>2.48***</td>
<td>16.3</td>
<td>81.5</td>
<td>411.7</td>
</tr>
<tr>
<td>(2009-2011)</td>
<td>[6.88]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term</td>
<td>2.06***</td>
<td>14.7</td>
<td>73.5</td>
<td>509.0</td>
</tr>
<tr>
<td>(2009-2012)</td>
<td>[3.04]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors' calculations
Japanese Bullet Train
### Impact of Kyushu Shinkansen Rail on CORPORATE TAX revenue during 2nd PHASE OF OPERATION period {2011-2013}, mln. JPY (adjusted for CPI, base 1982)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression 1</th>
<th>Regression 2</th>
<th>Regression 3</th>
<th>Regression 4</th>
<th>Regression 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment2</td>
<td>72330.012**</td>
<td>5.5277056***</td>
<td>5.5585431***</td>
<td>5.558603***</td>
<td>5.9640287***</td>
</tr>
<tr>
<td>Number of tax payers</td>
<td>[2.2]</td>
<td>[3.13]</td>
<td>[3.14]</td>
<td>[3.14]</td>
<td>[3.07]</td>
</tr>
<tr>
<td>Treatment3</td>
<td>104664.34*</td>
<td>82729.673**</td>
<td>80998.365**</td>
<td>82729.673**</td>
<td>80998.365**</td>
</tr>
<tr>
<td>Treatment5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Treatment7</td>
<td>179632</td>
<td>179632</td>
<td>179632</td>
<td>179632</td>
<td>179632</td>
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<tr>
<td>TreatmentCon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-568133.98**</td>
<td>-573747.28**</td>
<td>-574245.87**</td>
<td>-576867.56**</td>
<td>-642138.87**</td>
</tr>
<tr>
<td>N</td>
<td>611</td>
<td>611</td>
<td>611</td>
<td>611</td>
<td>611</td>
</tr>
<tr>
<td>R2</td>
<td>0.350653</td>
<td>0.350653</td>
<td>0.352144</td>
<td>0.352874</td>
<td>0.364088</td>
</tr>
<tr>
<td>F</td>
<td>5.062509</td>
<td>5.486197</td>
<td>5.351791</td>
<td>5.431088</td>
<td>16.5518</td>
</tr>
</tbody>
</table>

**Note:** Treatment2 = Time Dummy (1991-2003) x Group2. etc. t-values are in parenthesis. Legend: * p<.1; ** p<.05; *** p<.01.

Clustering standard errors are used, allowing for heteroscedasticity and arbitrary autocorrelation within a prefecture, but treating the errors as uncorrelated across prefectures.

<table>
<thead>
<tr>
<th>COMPOSITION OF GROUPS</th>
</tr>
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<tbody>
<tr>
<td>Group2</td>
</tr>
<tr>
<td>Kagoshima</td>
</tr>
<tr>
<td>Kumamoto</td>
</tr>
<tr>
<td>Group5</td>
</tr>
<tr>
<td>Kagoshima</td>
</tr>
<tr>
<td>Kumamoto</td>
</tr>
<tr>
<td>Fukuoka</td>
</tr>
<tr>
<td>Group3</td>
</tr>
<tr>
<td>Kagoshima</td>
</tr>
<tr>
<td>Miyazaki</td>
</tr>
<tr>
<td>Group7</td>
</tr>
<tr>
<td>Kagoshima</td>
</tr>
<tr>
<td>Fukuoka</td>
</tr>
<tr>
<td>Oita</td>
</tr>
<tr>
<td>GroupCon</td>
</tr>
<tr>
<td>Kagoshima</td>
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<tr>
<td>Kumamoto</td>
</tr>
<tr>
<td>Fukuoka</td>
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<tr>
<td>Osaka</td>
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References


