



**Demographic-Economic-Institutional Dynamics
in East Asian Countries:
Flying Geese Paradigm Ver 2.0**

Masahiko Aoki
Stanford University

The theme of my talk

- Present a simple frame for understanding East Asian development (China, Korea, Japan)
 - in terms of demographic-economic-institutional co-dynamics;
 - that captures commonality, differences, and linkages in these countries.

GDP comparison (2009, IMF)

	Nominal (Billion US\$)	PPP	Ranking by PPP	Per capita (PPP)
China	4,985	9,047	2	6,778
Japan	5,068	4,159	3	32,554
Korea	832	1,364	12	27,938
Taiwan	378	735	19	31,776
Hong Kong	210	307	-	42,653
Singapore	182	239	45	50,180
East Asia, total	11,655	15,851	-	-
US	14,119	14,256	1	45,934
Canada	1,336	1,281	14	37,947
Mexico	875	1,466	11	13,609
NAFTA	16,330	17,003	-	-
EU	16,415	14,773	-	-

Resurgence of East Asia

(Maddison: 1990 International \$)

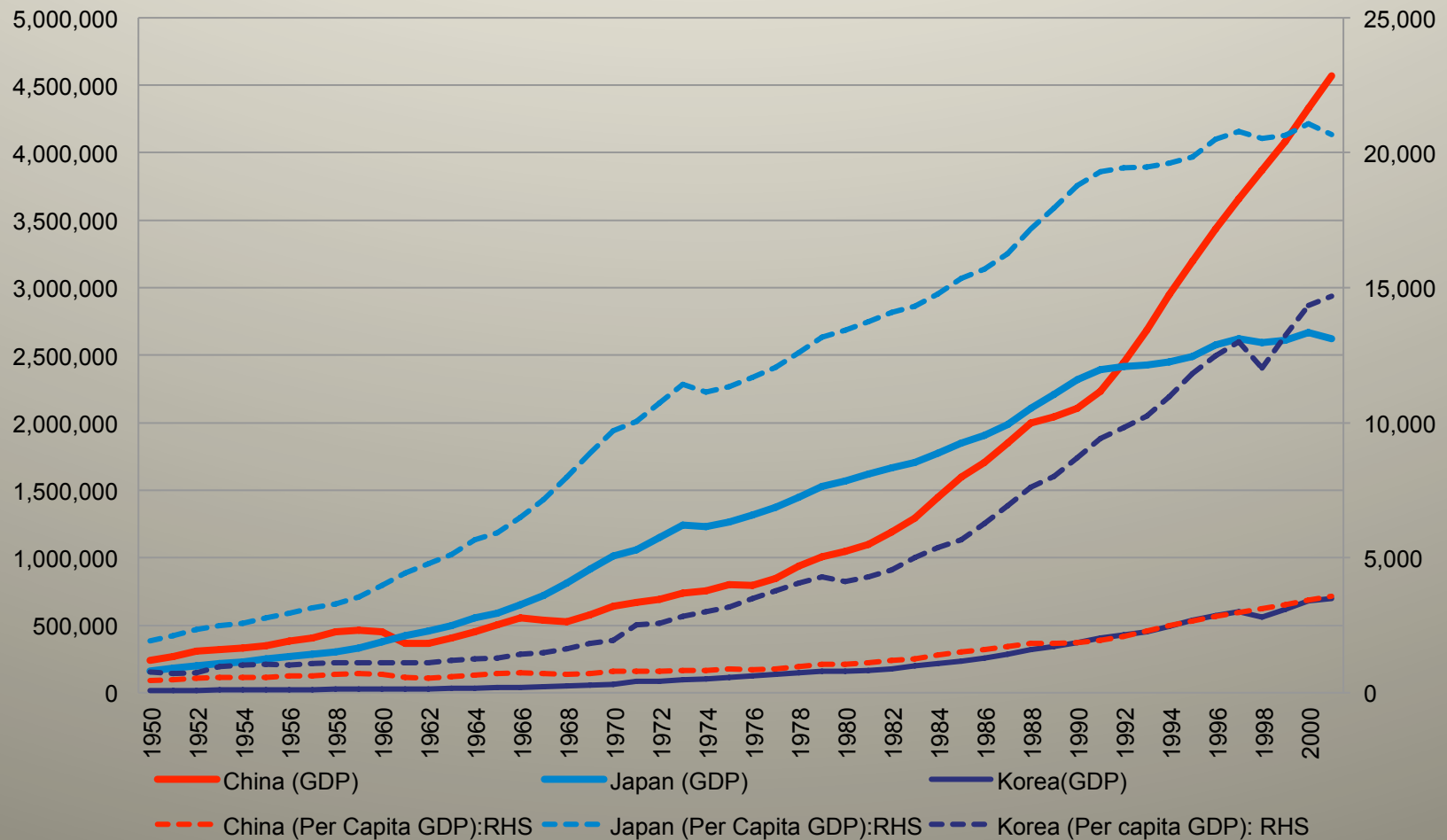
	1820	1950	2003	Per capita/ 2003
China	228.6 (32.9%)	245.0 (4.6%)	6,188.0 (15.1%)	4,803
Japan	20.7 (2.9%)	161.1 (3.1%)	2,699.2 (6.5%)	21,218
Korea	5.6 (0.8%)	17.8 (0.3%)	758.2 (1.8%)	15,732
East Asia	254.0 (36.6%)	424.4 (7.9%)	9645.4 (23.6%)	
W. Europe	159.8 (23.8%)	1,396.1 (26.1%)	7,857.4 (19.2%)	19,912
US	12.6 (1.8%)	1,455.9 (27.2%)	8,430.7 (20.6%)	29,037
World Total	694.6 (100.0%)	5,337 (100.0%)	40,913 (100.0%)	6,516

Japan, China, Korea (GDP/PPP)

by Maddison (1990 Geary-Khamis \$)

○ 1990-million M G-K

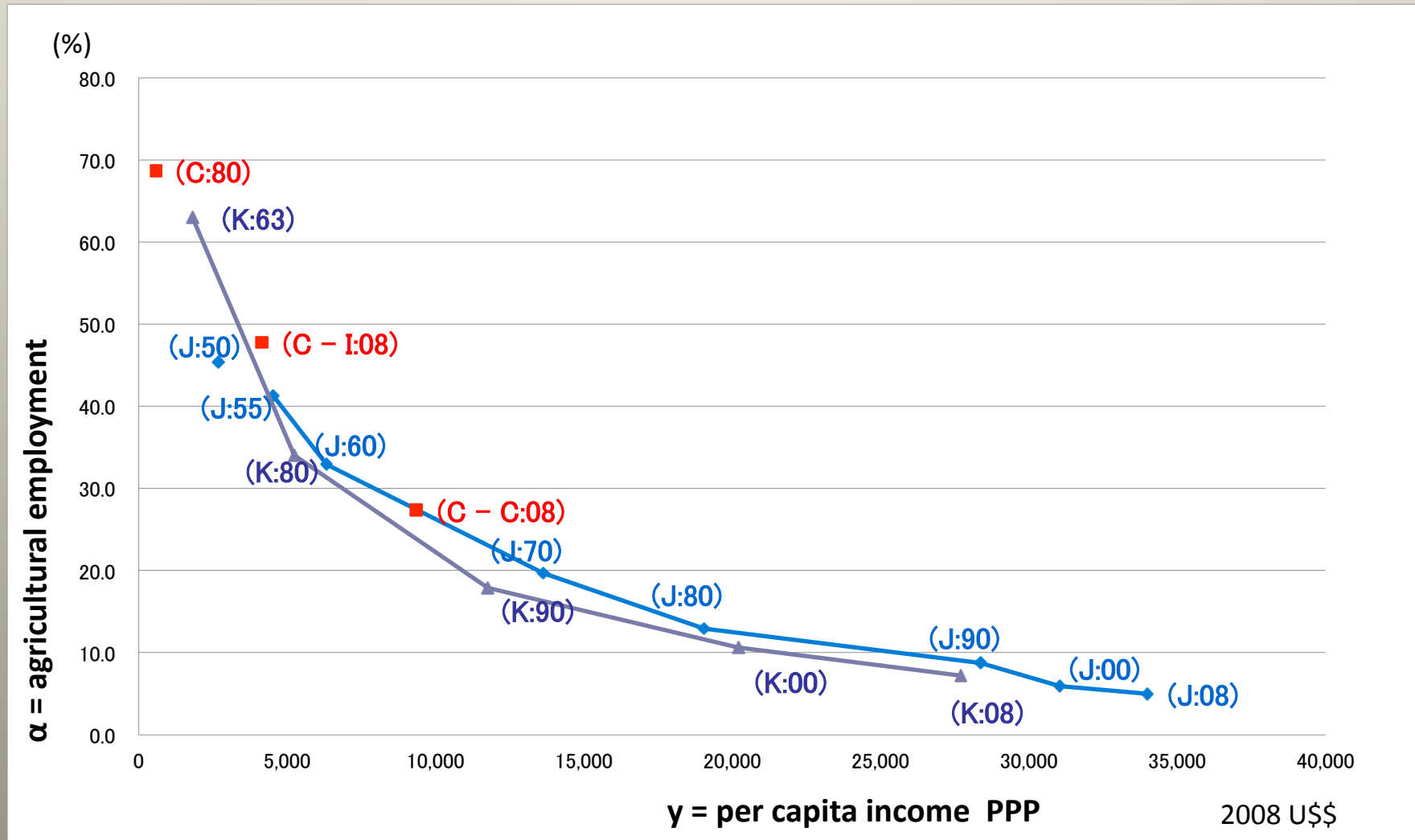
1990 G-K



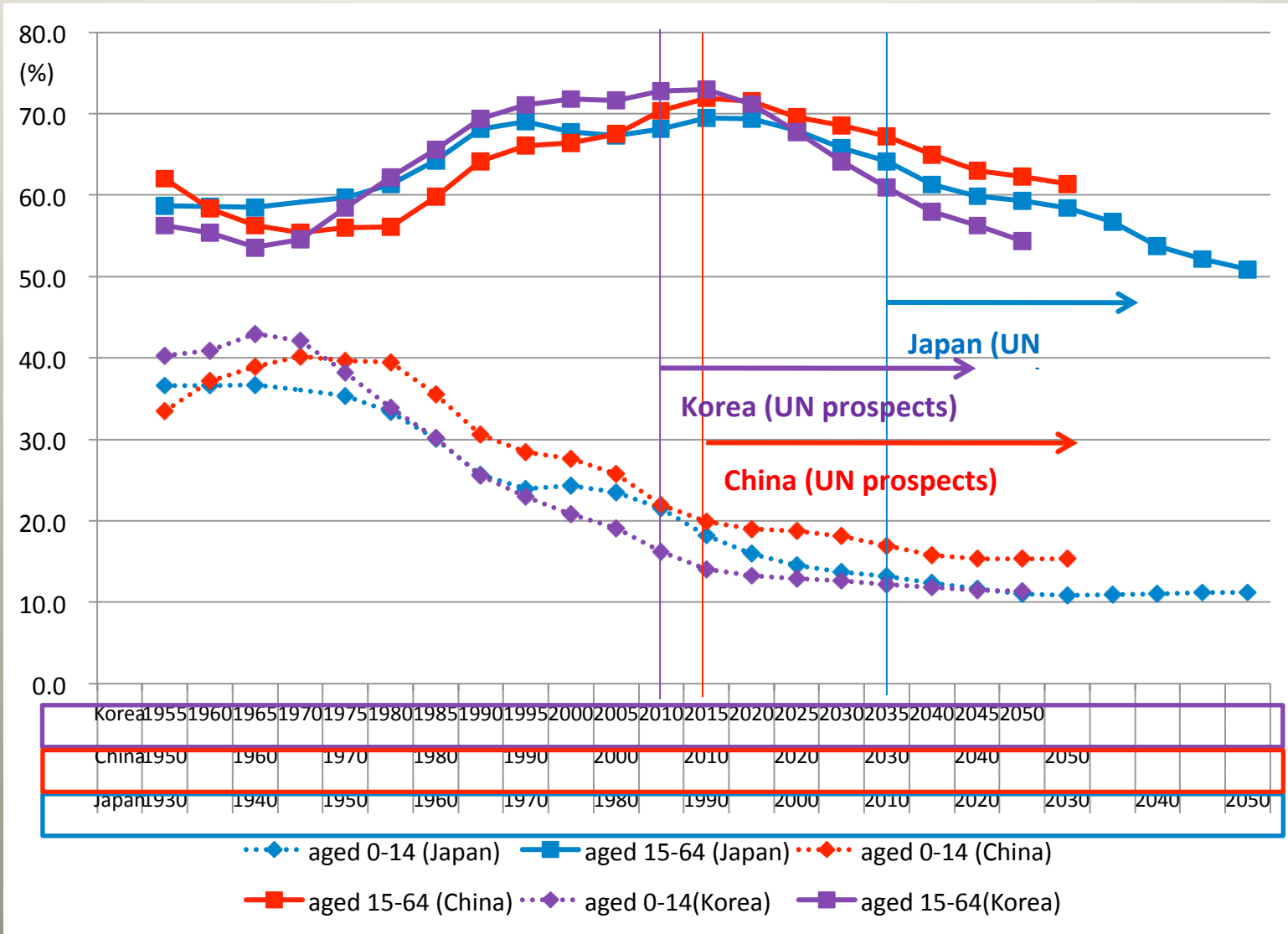
Questions and premises

- Making of a powerful economic zone in East Asia? Are there linkages to make East Asian economies more integrated? Will China dominate the region by its sheer size?
- It is said that East Asia is different from EU in its diversity in the stage of economic development, vigor, political institution, culture, and so on. At the same time there are common features as well (what are they?)
- GDP size of a country is important in terms of its impact on global markets, capacity to provide public goods (including defense), etc. But we focus on per capita GDP as a proxy of economic welfare (cf. Kuznets. How about externalities, social development index, etc.?)

Development Path: Japan-China-Korea

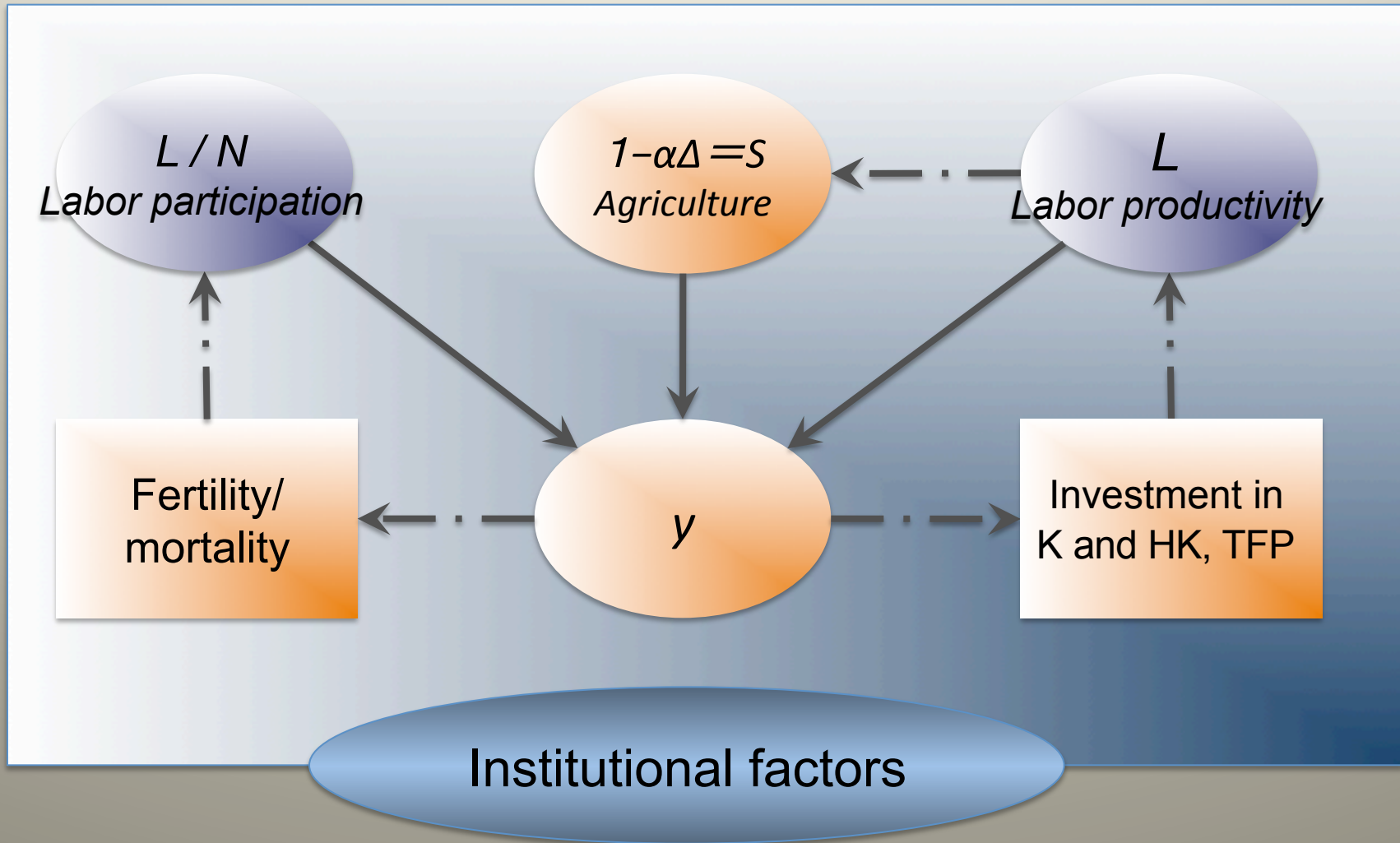


Demographic Patterns: Active and Child Populations



Dynamic mechanism behind accounting

$$\text{identity: } y \Leftrightarrow L/N \cdot P_{MS} [1 - \alpha\Delta]$$



A simple accounting Identity involving migration and demographic change

Y = GDP

N = Population

E = Total Employment

Y_i = Output of the i -th sector, $i = A$ (primary), MS (second & tertiary)

E_i = Employment of the i -th sector, $i = A, MS$

$Y = Y_A + Y_{MS}$, $E = E_A + E_{MS}$ so that

$$y = Y/N = E/N [E_A/E \times Y_A/E_A + E_{MS}/E \times Y_{MS}/E_{MS}]$$
$$= E/N \times Y_{MS}/E_{MS} [1 - \alpha\Delta]$$

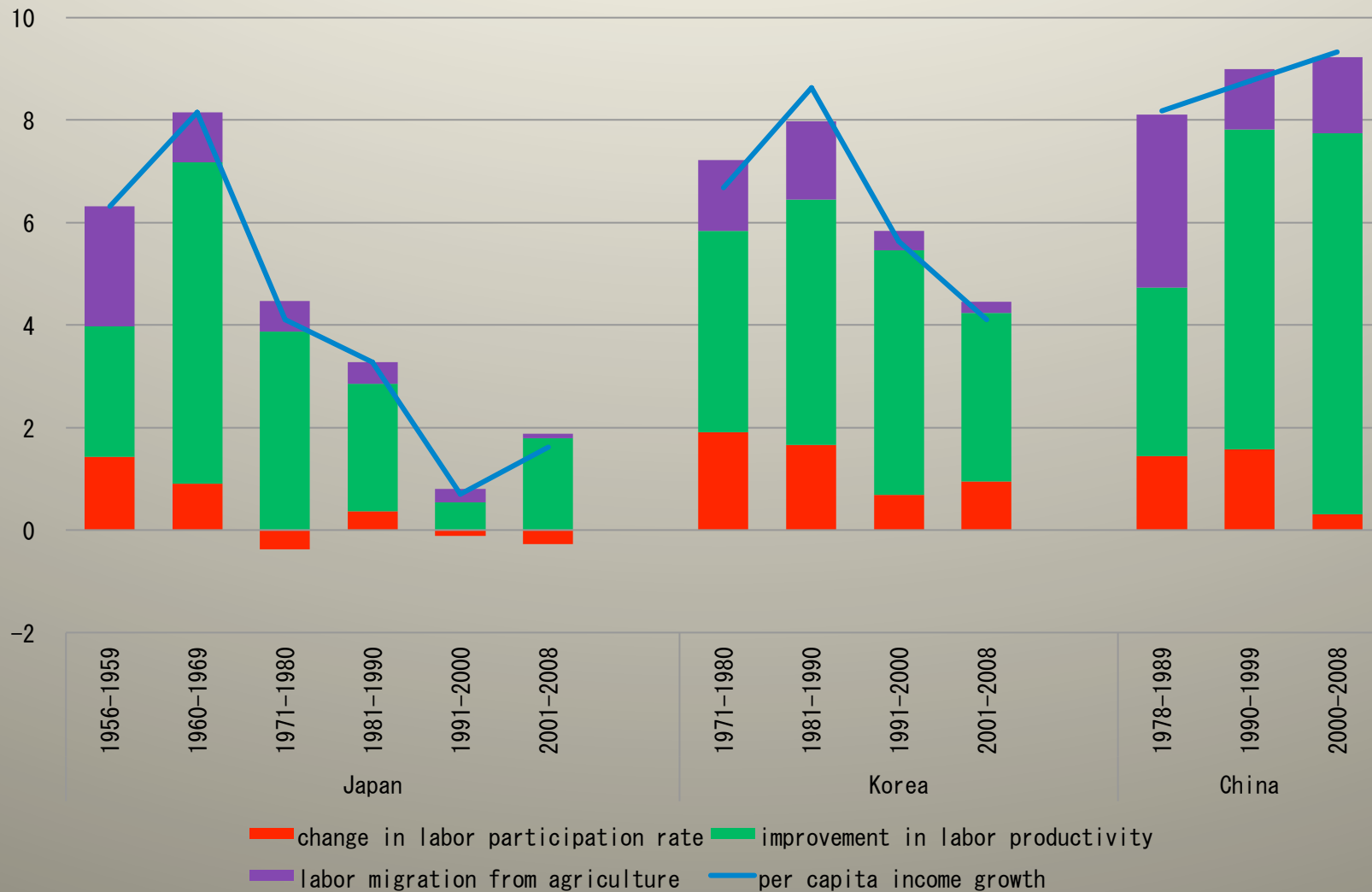
where $\alpha = E_A/E$ and $\Delta = [E_{MS} - E_A]/E_{MS}$. Let $[1 - \alpha\Delta] = S$, which measures impacts of structural factors, the employment share of A-sector α and productivity differential between the MS-sector and A-sector Δ , on per capita income y .

Then, the rates of growth $g(\cdot)$ of various variables satisfy the following relation:

$$g(y) = [g(E) - g(N)] + g(Y_{MS}/E_{MS}) + g(S)$$
$$= [g(E) - g(N)] + g(TFP_{MS}) + \theta_{MS} [g(K_{MS}) - g(E_{MS})] + g(S)$$

where K_{MS} = input of capital service in the MS-sector and θ_{MS} = capital share in the MS-sector.

Sources of per capita income growth (Japan ▪ Korea ▪ China)



Evolutionary pattern of East Asian development

- *Phase 0: Dominant peasant economy.*
- *Phase I: Initial Industrialization* through taxation on agricultural surplus, but with limited labor mobility from agriculture.
- *Phase II: high growth* with increasing industrial labor inputs (demographic dividends and rapid migration) ($\alpha \Rightarrow 0.2$)
- *Phase III: stable per capita income growth* through autonomous industrial productivity improvement.
- *Phase IV: population maturity* (aging and low fertility)

Flying geese paradigm Ver 2.

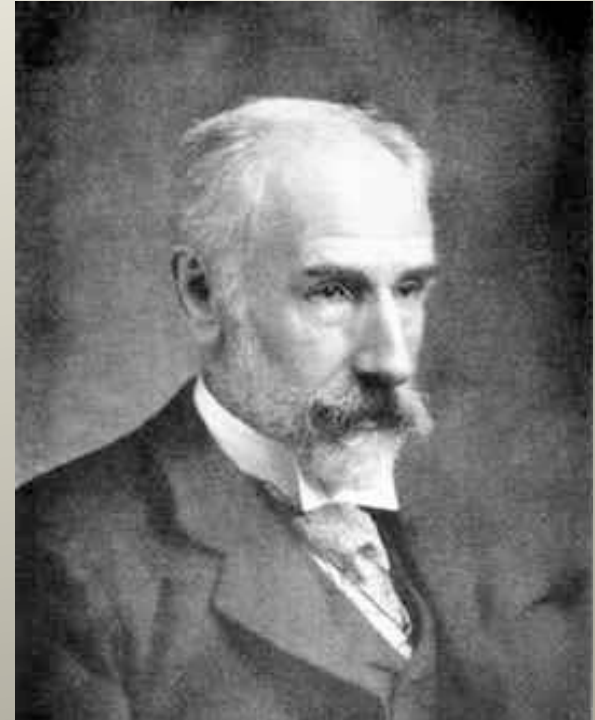
- Wild geese fly in a "V" formation. An once popular analogy was that the development in East Asia was pulled by the lead goose (Japan) who flies forward from one stage of technological development to the next, while followers are "aligned successively behind front runners." (Akamatsu, 1930). Such analogy can not be appropriate any more. Lead goose is getting older and flying toward the unknown territory (the mature population). But this flight would be followed by Korea and China before not too long.
- There are thus still **commonality and linkages** among developmental dynamics of East Asian economies, complemented by respective, **path-dependent** institutional trajectories. Thus, **Flying Geese Paradigm Ver.2.0.**
- Each phase has its own agenda, which includes solving problems accumulated in the previous phase or modifying solutions therein. Then, there can be mutual gains in the following sense: the ability of each economy to respond to strategically its own developmental agenda may be enhanced by the ability of others in a different phase and vice versa (strategic complementarities). The V formation is aero-dynamically efficient!

Challenges in the transitions

- In the transition to Phase III,
 - Realize continued improvement in labor productivity w/o massive population dividends/migration (cf. “Lewisian turning point”?)
 - With this as resource, respond to the “external costs of growth” accumulated in Phase II (e.g., energy/environment, urban congestion, rural-urban disparity, the lack of universal entitlements)
- In the transition to Phase IV,
 - Concentrate on niche markets, while globally diversifying manufacturing basis
 - Decline on the fertility rate is inevitable? (“Babies come back” by institutional innovation).
 - Re-design entitlements (generational political issue)
 - Deregulation/facilitation of international flows of human, goods, information and knowledge (TPP, immigration).
- To meet these challenges, corresponding political and social mechanisms need to evolve. Are Japan, China and Korea up to this?

Strategic complementarities

- So, China, Japan and Korea have to compete with each independently in order to solve their own national social-economic agenda?
- We may broaden the neoclassical notion of the “gains from trade” based on comparative advantages in resource endowments. There may be aspects of Edgeworth-type *complementarities* in international economic relations due to differences in the phase of demographic-economic dynamics: Between two national economies, each economy may be able to reciprocate what the other needs in coping with its own national agenda more effectively.



F.Y. Edgeworth

1845-1926

Initial conditions for institutional evolution

- Family-managed, peasant farming dominated economies before national industrialization in Japan, Korea and China.
 - This is the point emphasized by H.Oshima, Yujiro Hayami, Philip Huang and others as characteristics of monsoon agriculture. No plantation. (0.5~2ha)
 - On this common ecological basis, different social norms, corporations (organizations), and political power structure evolved to enforce taxation and land-leasing contracts between peasants and landlords, as well as among farmers, which would have impacts on **subsequent institutional trajectories in these economies (path-dependence)**. “The rural origin theory”?
 - Institutions (endogenous rules of the game. Not just laws) co-evolve with demographic-economic dynamics.

Thank you for listening!

Comments and suggestions are welcome.