DIFFERENT DIMENSIONS OF AGEING AND OF AGE-STRUCTURAL TRANSITIONS (AST): A COMPARATIVE VIEW

by

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TOKYO, 17th December 2012

AN AGEING JAPAN?

THIS PAPER HAS ONE GENERIC ARGUMENT, AND TWO SPECIFIC ARGUMENTS

- **Generic** – Relations between
  - (1) **the demographic transition**,
  - (2) **age-structural transitions (ASTs)** and
  - (3) **development**

  far more complex than generally realised.

  My specific arguments discuss these complexities.
- **Specific 1**: Phasic ASTs vs cohort effects
  Specific 2: structural vs numeric ageing

GENERIC ARGUMENT: I

- Literature: Bloom, Canning and Sevilla (RAND, 2003); also Jean-Claude Chesnais' *Pop and Dev Rev* 1990, shows Demographic transition → age-structural effects – more rapid fertility decline higher the "multiplier effects" on age-distribution.
- Underlying notion for Bloom *et al* and for me: that most supply and demand factors AGE-DEPENDENT, even fiscal sectors (Who pays taxes? Who needs them?)
- This carries across into labour force, into industrial sectors and into enterprise structures.

GENERIC ARGUMENT: II

1. Demographic transition phased
2. Phase 1, with decreases in mortality accelerated growth if fertility remains high; Phase 2, declines in fertility, decelerates growth; produces decreased %s young ages;
3. "**Momentum effects**" (*OED* definition) as cohorts move up through age groups thus changing age-distributions (I'll return to this point for old age *per se* in second part of paper). **2'dary momentum**: large parental cohorts born in past have large numbers of children AFTER a fertility decline occurs.

SPECIFIC I: PHASIC VS COHORT

- Dividends models based on phasic changes
- Recognition in dividends' literature that realising on these changes also dependent on policy environment and markets
- **But** little understanding of demographic constraints that I will discuss
  - Their duration – "window of opportunity"
  - Disordered cohort flows

(see Pool, Special Issue, *Ageing Horizons*, Oxford Univ Inst of Ageing, 7, 2007 www.ageing.ox.ac.uk/ageinghorizons/)

PHASIC CHANGES

Phasic Changes, the basis of the “demographic dividends’” literature, positing shifts

- from very youthful structure (say 30+ % at 0-14 yrs – can be much higher – 50% in really high growth countries)
- to high %-ages at working ages
- to high percentages at old age (say 15+%)

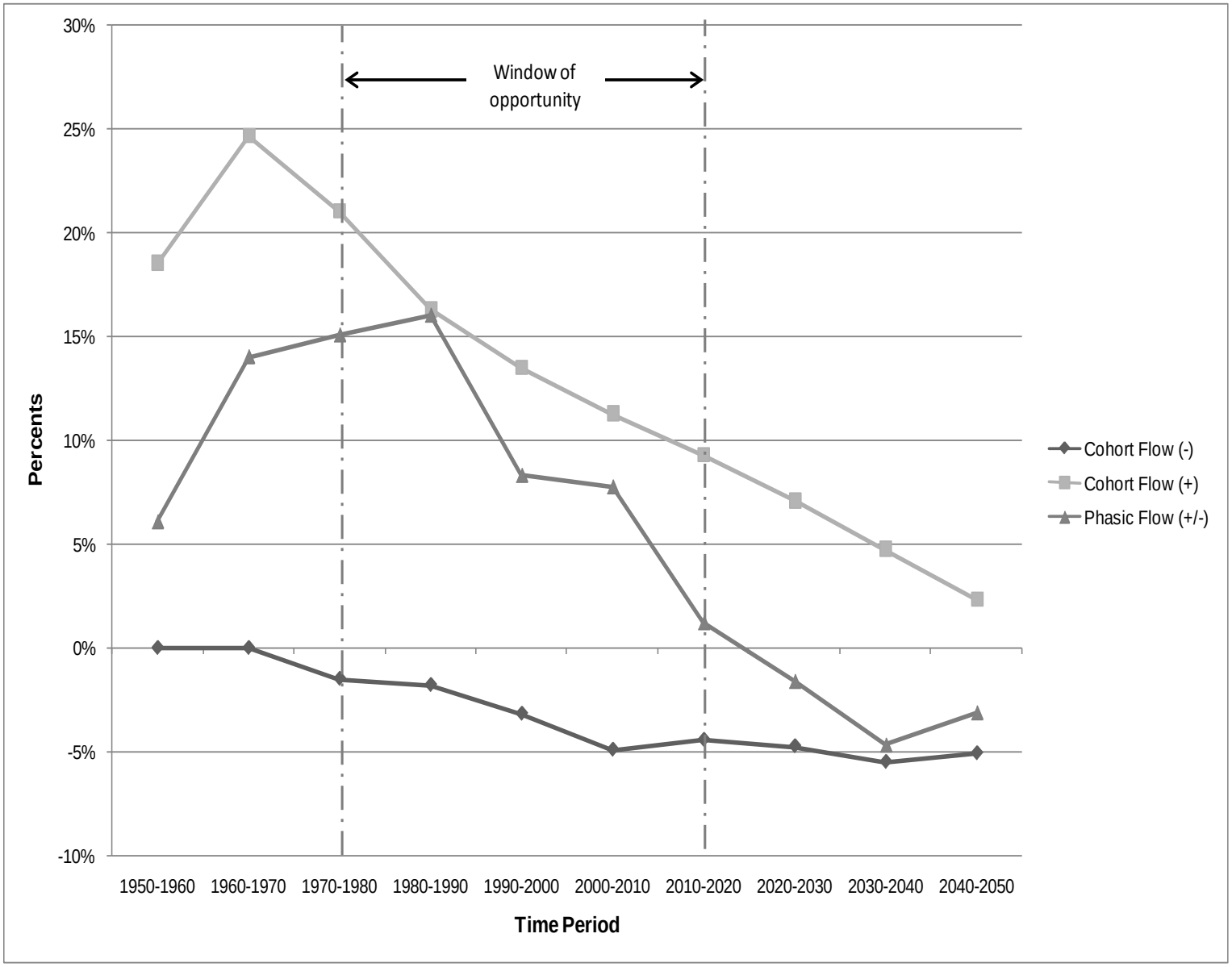
COHORT CHANGES

- Cohort changes much more turbulent; can occur **within** phasic changes; these can be “disordered cohort flows” (eg China; Russia).
- Thus, for demographic dividend literature, major problem: phases may be occurring as per the model, but being counteracted by significant inter-censal cohort fluctuations as the cohort passes through any age-group, *x* (+/-).
- Measurement: the phasic change, or cohort flows, over time t to t+n is divided by the total population at time t. Thus NET flows can be negative. Have to do this as some populations have negative growth
- Phasic flows, percentage of total population change coming from shifts at any phase, 0-14, 15-64, 65+
- Cohort flows are measured here by a more refined index based on the percentage of total population change coming from shifts in any decennial age-group.

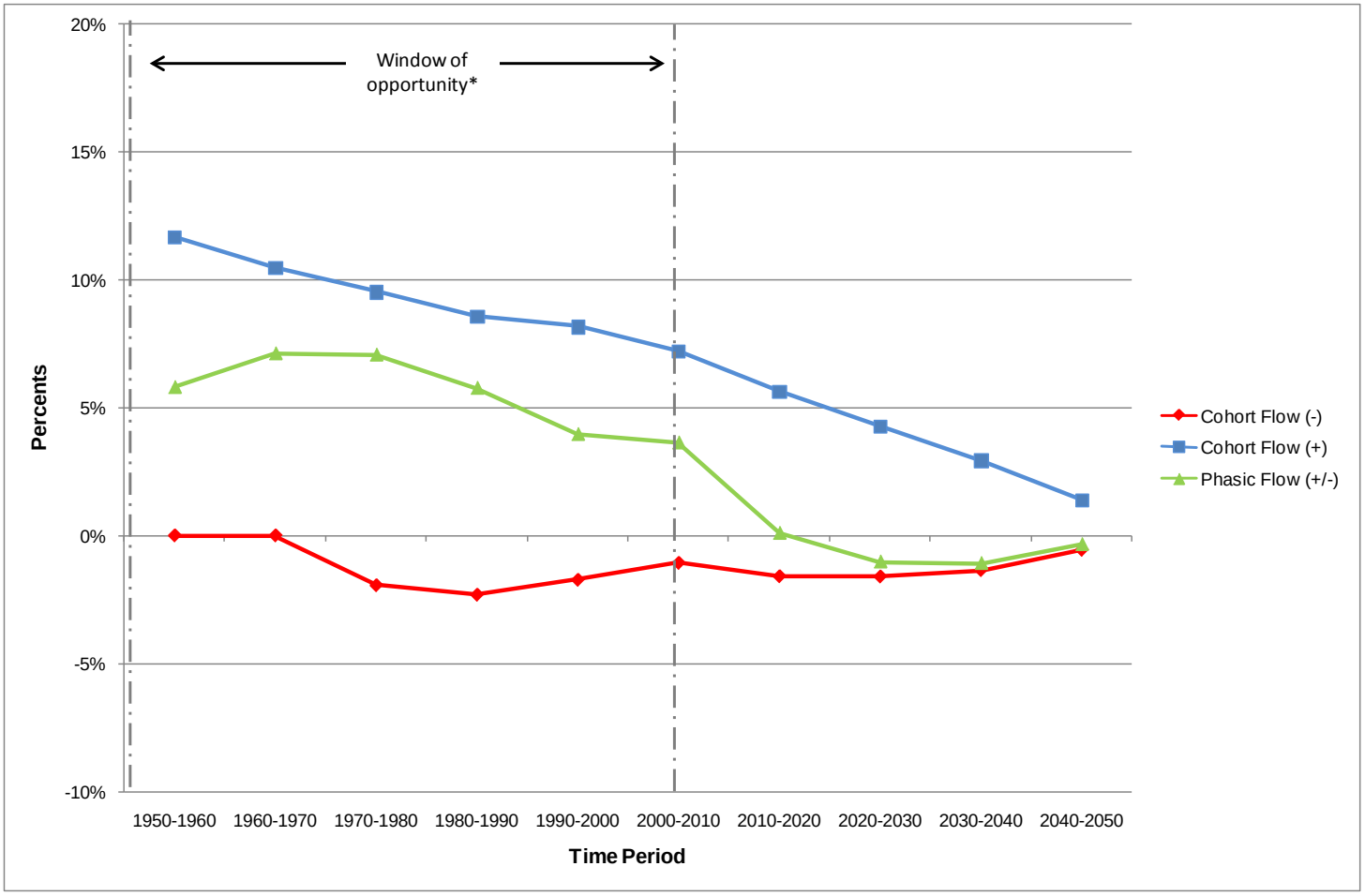
NEXT FOUR GRAPHS

- Compare Far Eastern Asia (incl Japan) with Western Developed Countries (also incl Japan)
- Next two NET changes; following two GROSS
- NET Phasic; NET Cohort (+/-), to remind us that cohort flows can go in two directions simultaneously even when phasic changes significant – major problems for policy and markets. Indicative measures – not definitive
- Note differences FEA and WDC for velocity flows, timing “windows of opportunity” (WO)
- WO = % P(0-14) < 30, yet %P(65+) still < 15

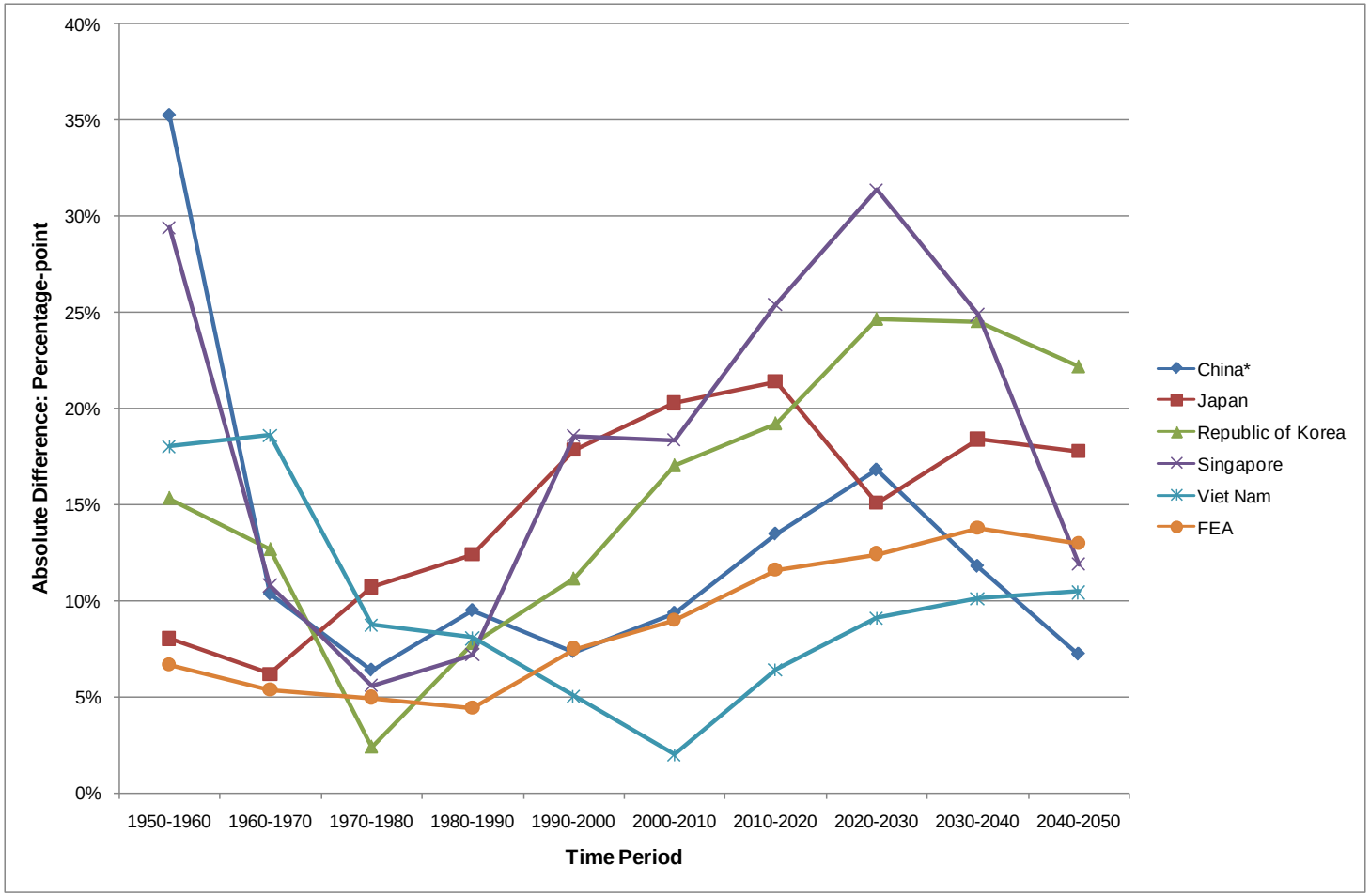
Fig. 1a: All East Asia, Net Phasic and Cohort Flows, 1950-60 – 2040-50



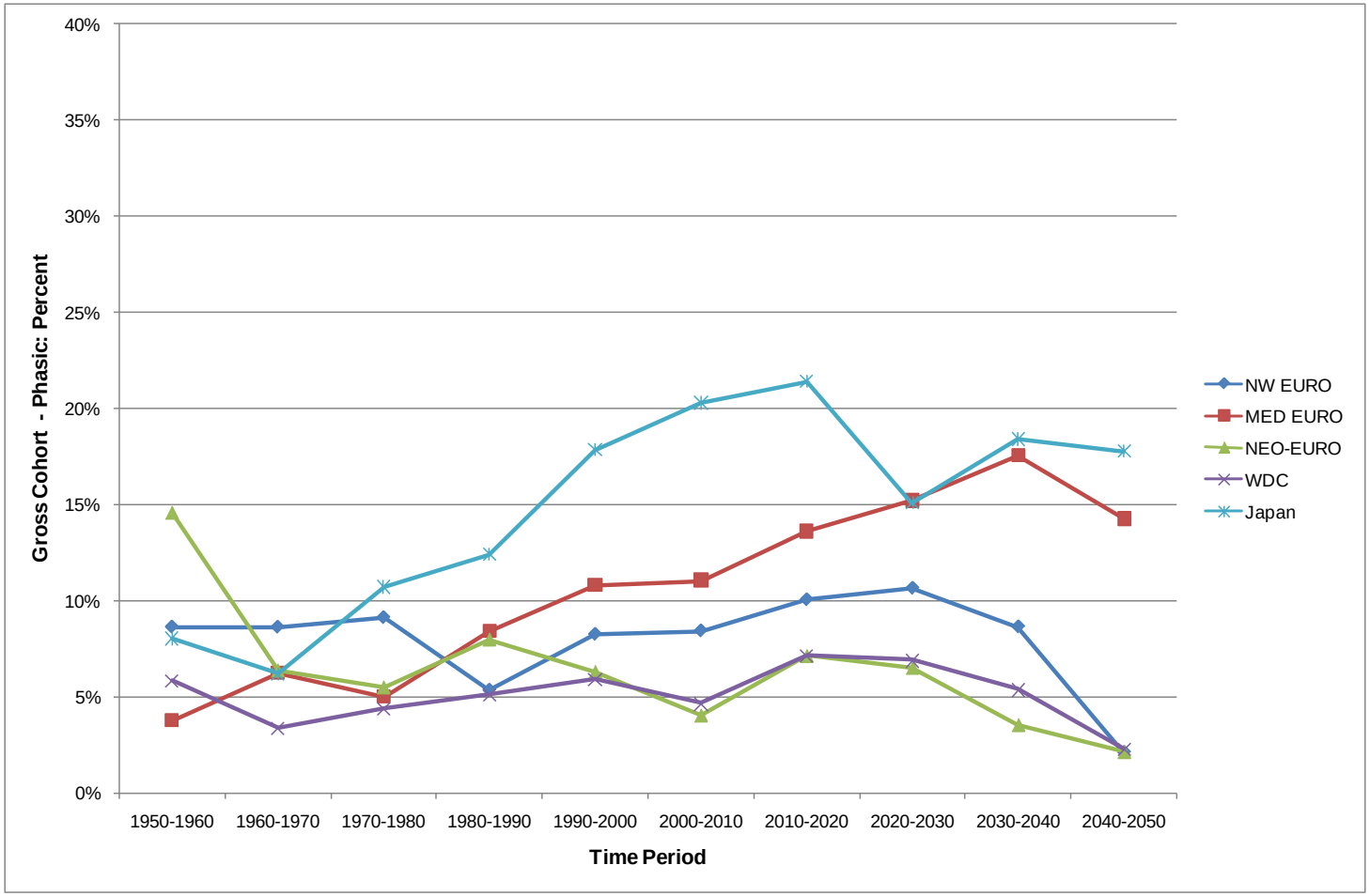
Phasic & Cohort Flows all WDC Countries, 1950-60 to 2040-50



Absolute Difference between Gross Cohort and Phasic Flows for FEA countries, 1950-60 – 2040-50



Absolute Difference between Gross Cohort and Phasic Flows for WDC, 1950-60 – 2040-50



PHASIC-COHORT DISJUNCTIONS

1. Clearly do not play out in perfect harmony; disjunctions can affect policy, markets if phasic going in one direction yet cohort in opposite.
2. FEA disjunctions > WDC's. Japan > other WDCs; in FEA Japan seems trend-setter.
3. Other work I have done shows
   - Competing trends between cohorts at same time
   - This has implications for policy setting

SPECIFIC II: DIFFERENT FORMS OF POPULATION "AGEING" (A)

- Academic/policy debates focus on:

(i) structural ageing, ignoring numerical *(see below); (ii) financial/economic responses to structural ageing – the least reliable data!!**

- Also, seen as standing apart from broader AST; demographic-technical emphasis on volume, determinants of ageing, not understood that merely phase in a much wider transition.

- * See Rowland, D (2009) 'Global Population Aging: History and Prospects', in Uhlenberg, P (ed) *International Handbook of the Demography of Aging*, NY: Springer Verlag: Chapt 3.
- ** Most robust numerical projections -- populations already born and enumerated; structural less so -- cannot easily predict future fertility; economic even less reliable; financial least

SPECIFIC II: DIFFERENT FORMS OF POPULATION "AGEING" (B)

- Problems: (i) Numerical and structural each have different policy and market implications; (ii) their mix has further implications (see below)
- Polemical, phrases such as "tsunami", as if sudden event or "agequake"; Elderly Burden
- Used by Thatcherite politicians to attack Welfare State
- INDICES: Structural ageing = P(65+) / Total P

Numerical Ageing* = P(65+) (t)/ P(65+) (t-n)

* Rowland points out that the correct phrase is "Growth in Numbers at 65+", but clumsy phrase, so I will use "numerical ageing" .

Postulated Effects of Different Mixes of Numerical and Structural Ageing (discussed quandrant by quadrant below)

Structural Ageing slow	-Aged dependency burden and needs for inter-generational transfers both grow slowly, allowing more time to accumulate household savings and to increase fiscal capacities.
Numerical Ageing rapid	-Absolute growth of aged population rapid, and thus little time to invest in infrastructure and build human capital for gerontological services.
	Effects of mix most extreme
Structural Ageing rapid	-Aged dependency burden and needs for intergenerational transfers both grow rapidly, and thus there is limited time to accumulate household savings and to increase fiscal capacities.
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Structural Ageing slow	-Aged dependency burden and needs for intergenerational transfers both grow slowly, allowing more time to accumulate household savings and to increase fiscal capacities.
Numerical Ageing slow	-Absolute growth of aged population slower, so that society can plan better investment in infrastructure, and building human capital for gerontological services
	Effects of mix least severe
Structural Ageing rapid	-Aged dependency burden and needs for intergenerational transfers both grow rapidly, and thus there is limited time to accumulate household savings and to increase fiscal capacities.
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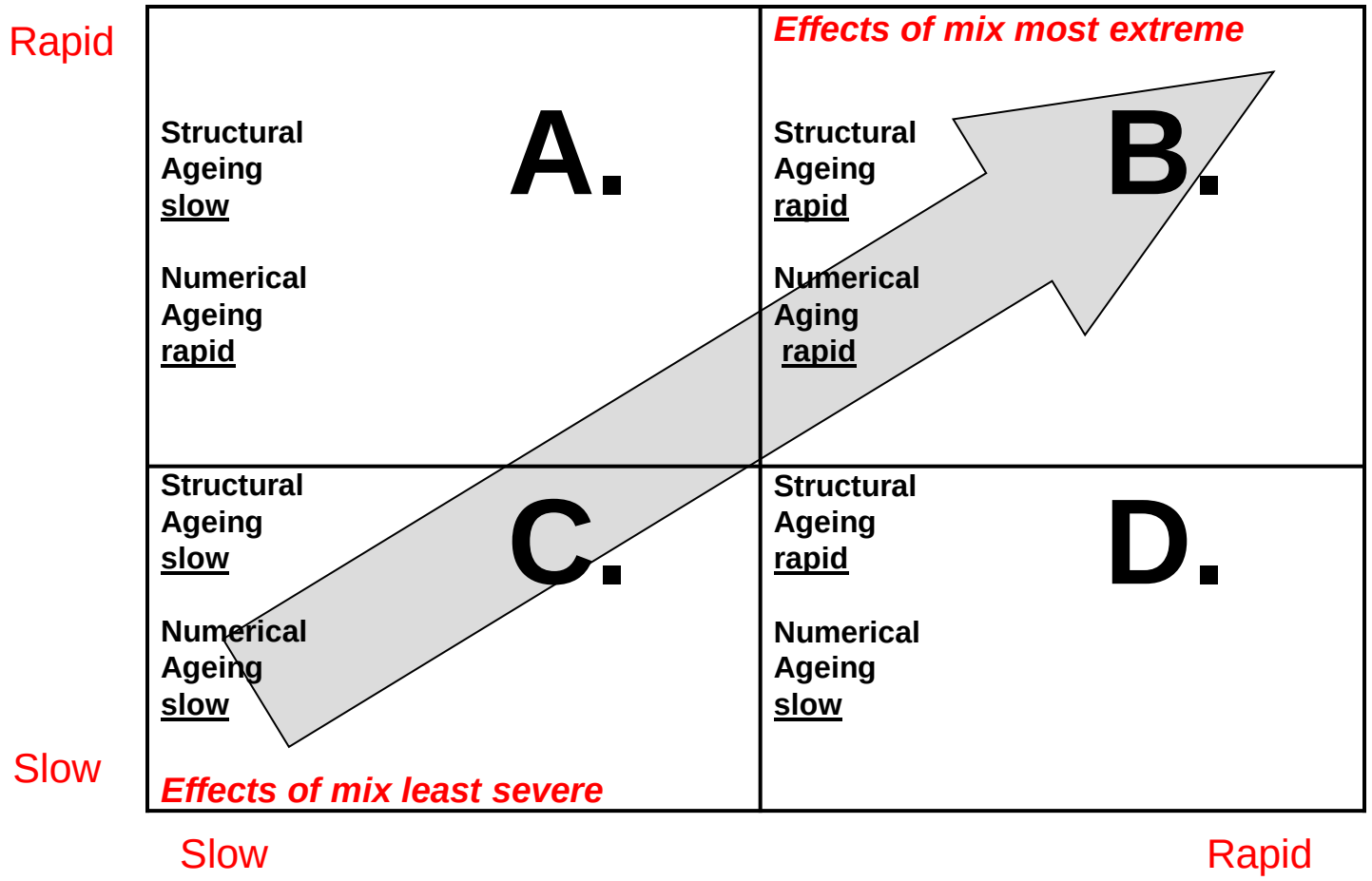
Diagram, Postulated Effects, Different Mixes of Numerical (vertical axis) & Structural Ageing (horizontal)



A.

Structural Ageing **<u>slow</u>**	•Aged dependency burden and needs for inter-generational transfers both grow slowly, allowing more time to accumulate household savings and to increase fiscal capacities.
Numerical Ageing **<u>rapid</u>**	•Absolute growth of aged population rapid, and thus little time to invest in infrastructure and build human capital for gerontological services.

B.

	Effects of mix most extreme
Structural Ageing <u>rapid</u>	•Aged dependency burden and needs for intergenerational transfers both grow rapidly, and thus there is limited time to accumulate household savings and to increase fiscal capacities.
Numerical Aging <u>rapid</u>	•Absolute growth of aged population rapid, and thus little time to invest in infrastructure and build human capital for gerontological services.

C.

Structural Ageing <u>slow</u>	•Aged dependency burden and needs for intergenerational transfers both grow slowly, allowing more time to accumulate household savings and to increase fiscal capacities.
Numerical Ageing <u>slow</u>	•Absolute growth of aged population slower, so that society can plan better investment in infrastructure, and building human capital for gerontological services ***Effects of mix least severe***

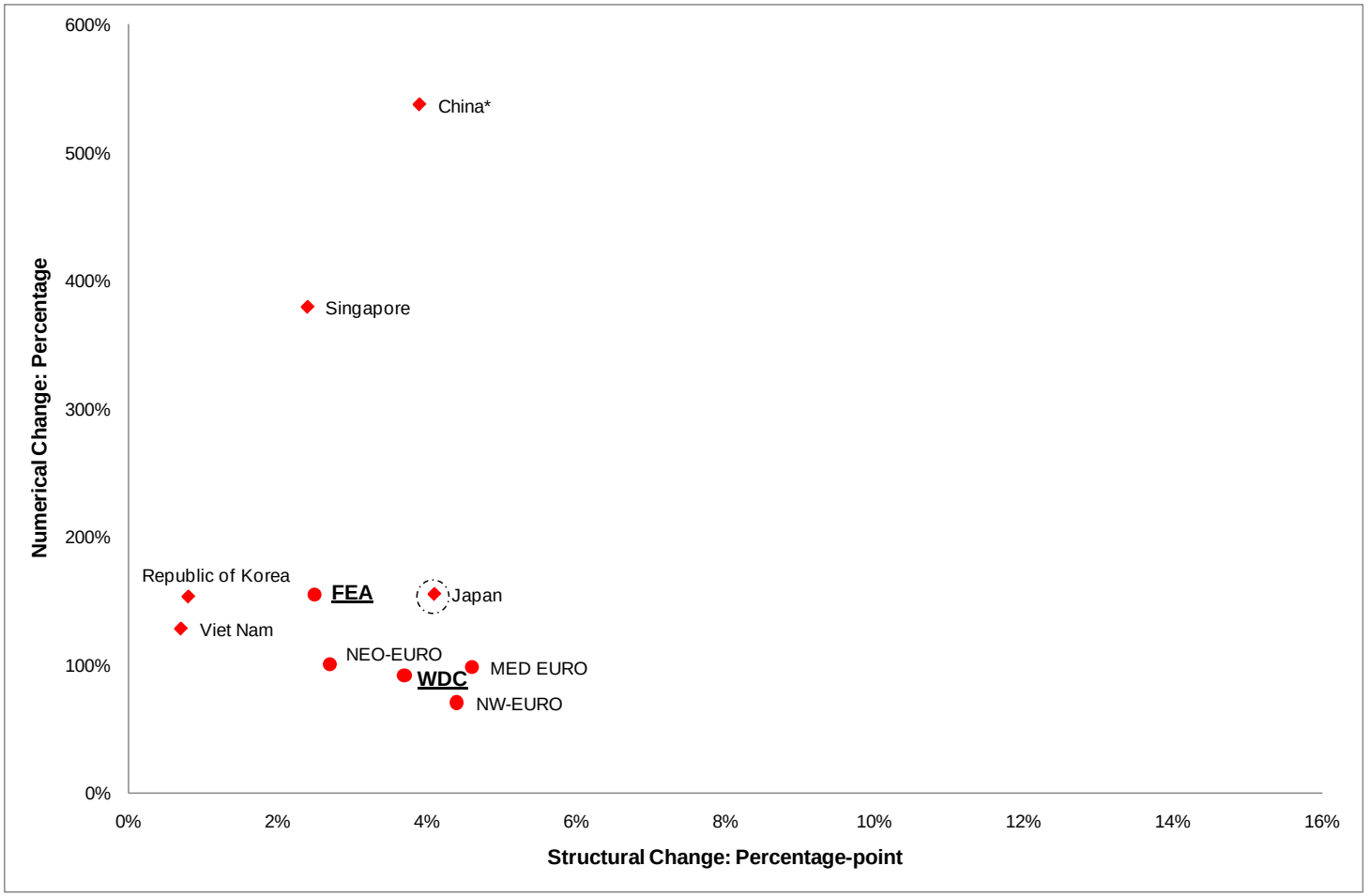
D.

Structural Ageing **<u>rapid</u>**	•Aged dependency burden and needs for intergenerational transfers both grow rapidly, and thus there is limited time to accumulate household savings and to increase fiscal capacities.
Numerical Ageing **<u>slow</u>**	•Absolute growth of aged population slower, so that society can plan better investment in infrastructure, and building human capital for gerontological services

Graphs of Mixes of Numerical and Structural Ageing

- The mixes in cells A, B, C and D in the population data to be graphed below.
- I take 6+ %-points structural growth as rapid. The cut-off point for numerical growth is 80+%. Both values are arbitrary.
- After 1980, Japan extreme example of cells B and D. But 2010 -> Japan least extreme of FEA
- Note how FEA > WDC, even Mediterrannean.
- Rankings for each vary. Thus general models of ageing do not apply – country-specific.

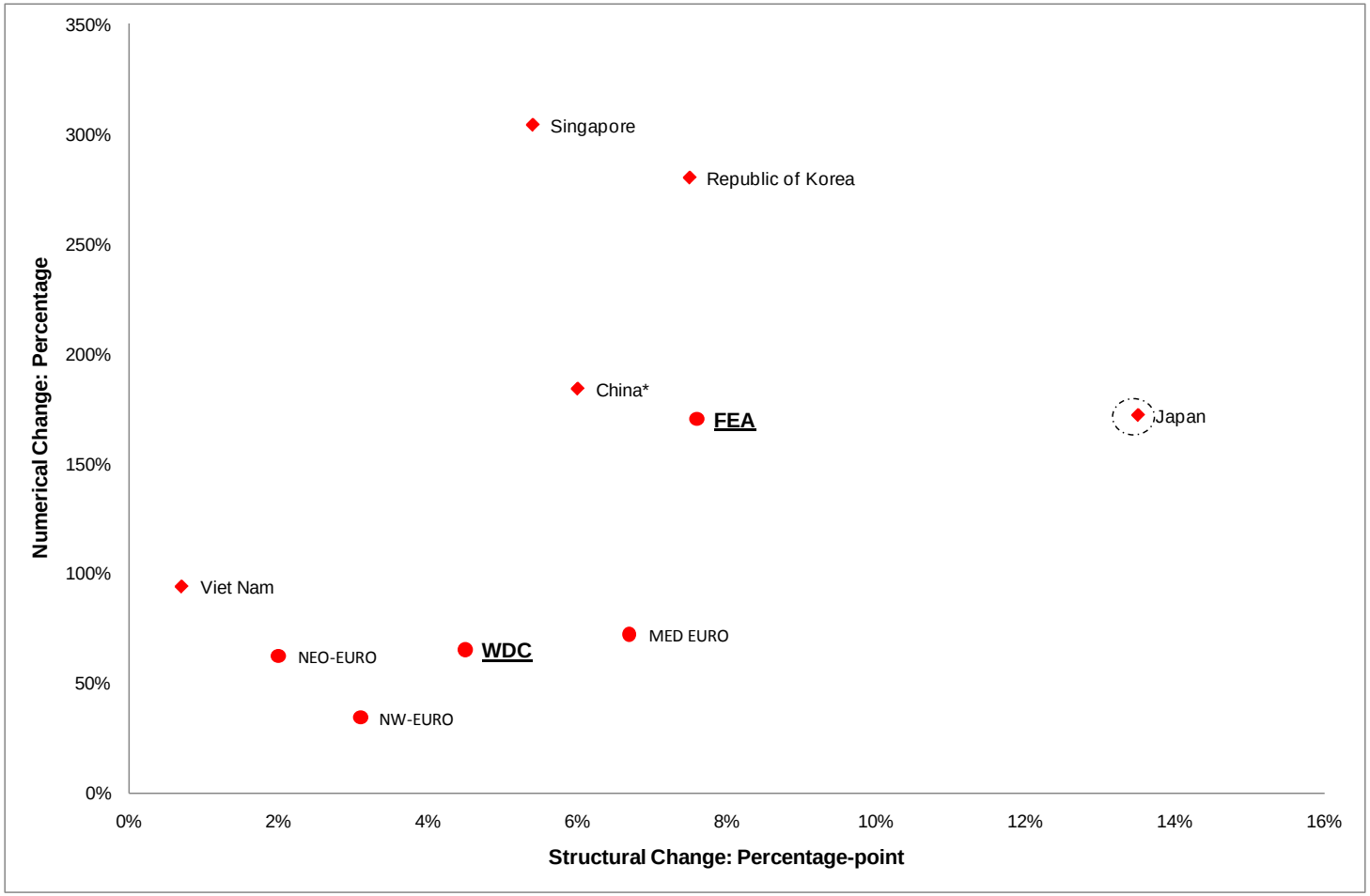
Mixes of Numerical & Structural Ageing for FEA countries, 1950-1980 (Total FEA & WDCs = dots)



Note: Vertical Scales in FEA and WDC graphs are different

* China includes Hong Kong and other Special Administrative Regions (SARs)

Mixes of Numerical and Structural Ageing, FEA countries, 1980-2010



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Mixes of Numerical and Structural Ageing for FEA countries, 2010-2040

Note: Vertical Scales in FEA and WDC graphs are different

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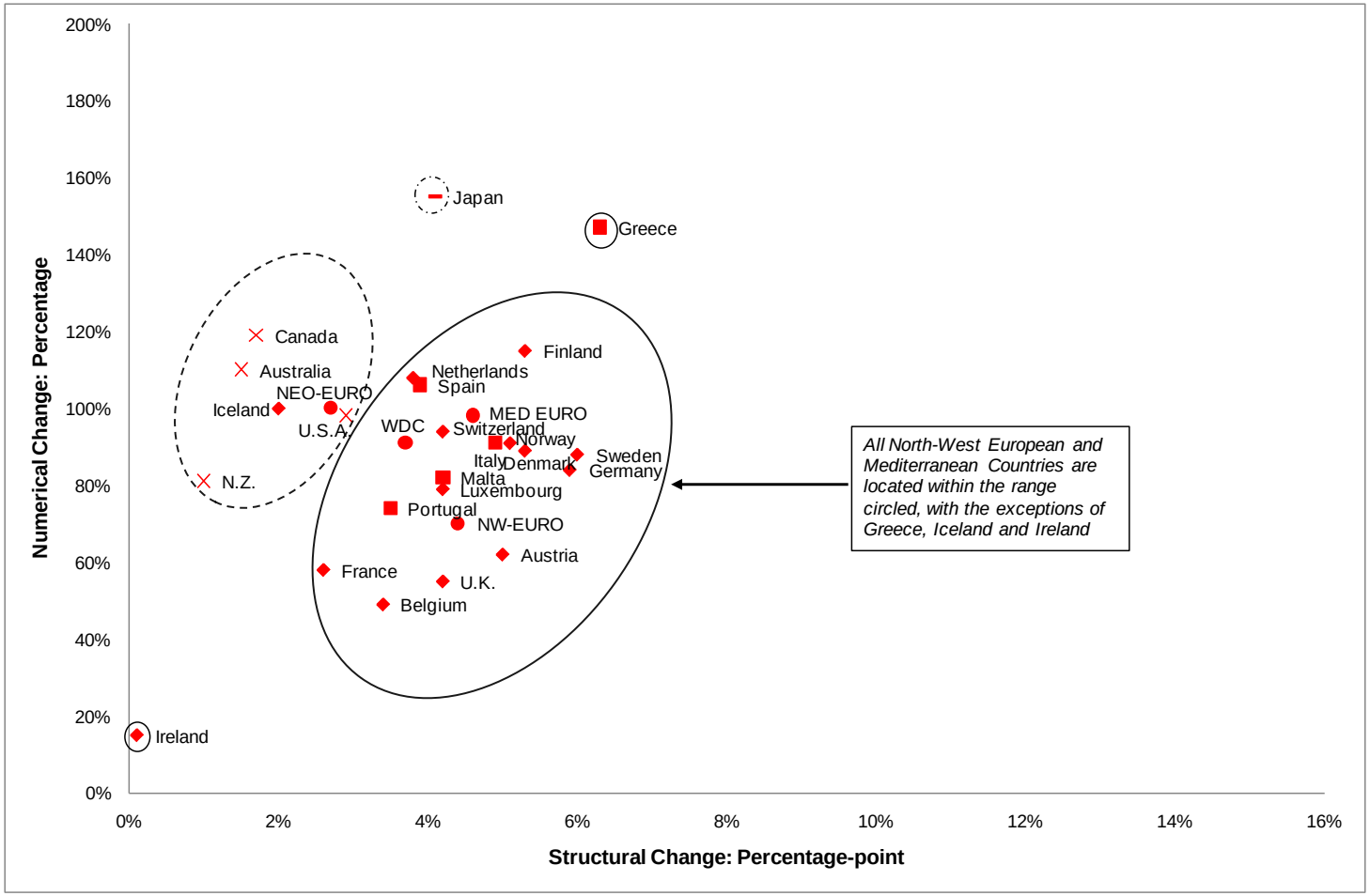
Mixes of Numerical and Structural Ageing for WDCs, 1950-1980



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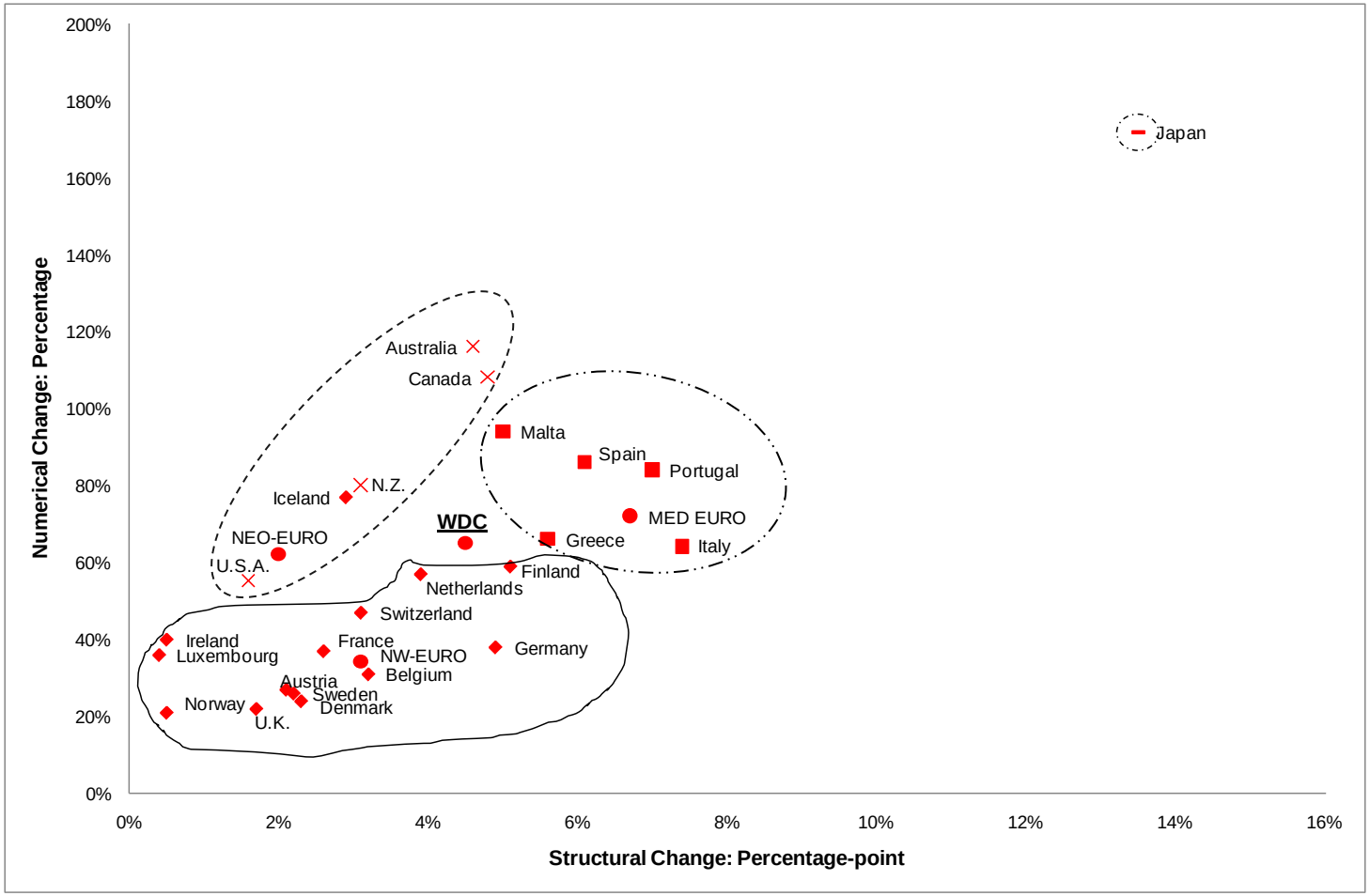
Mixes of Numerical and Structural Ageing for WDCs, 1980-2010



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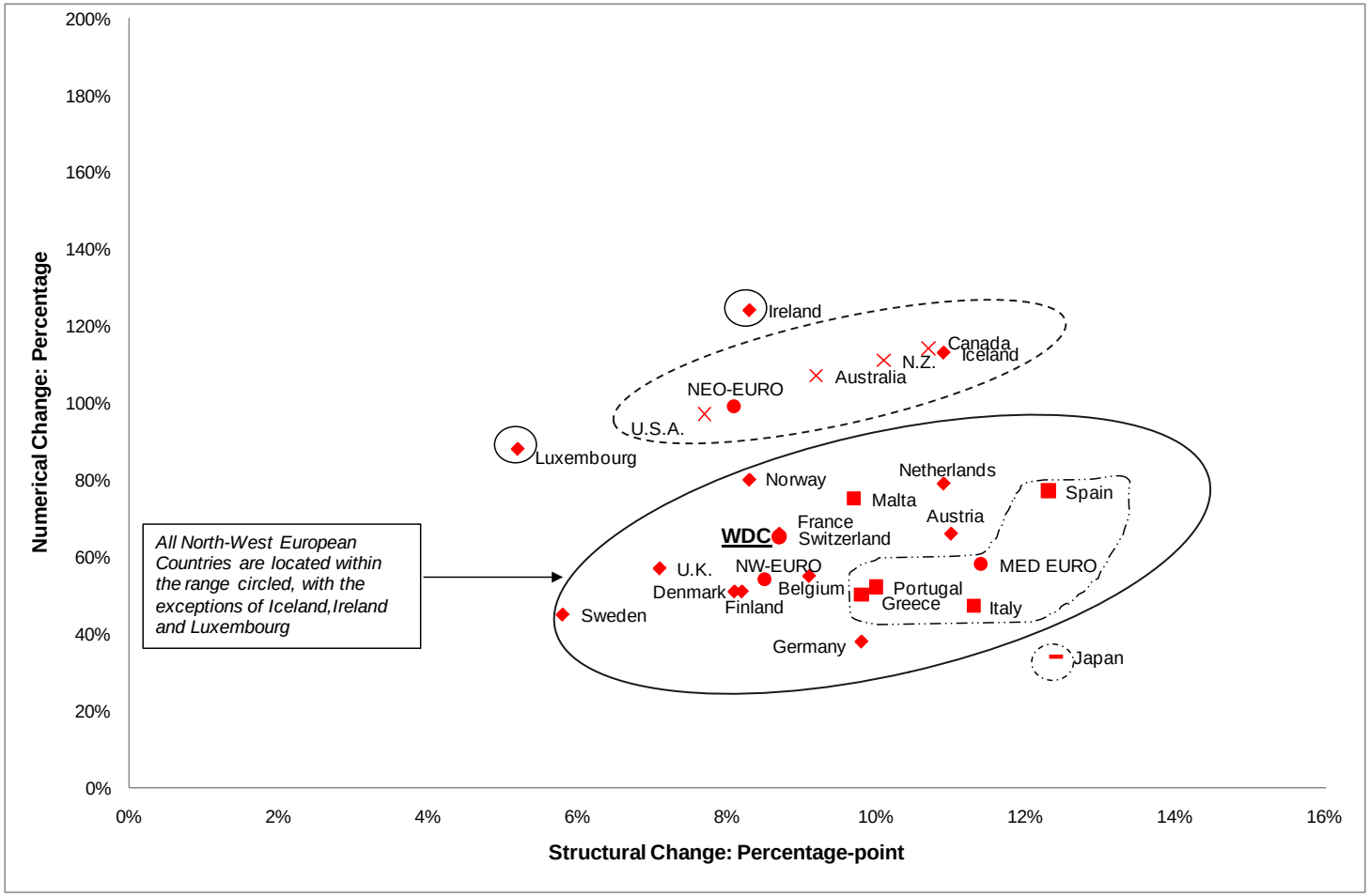
Mixes of Numerical and Structural Ageing for WDCs, 2010-2040



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Conclusion: The Generic comes back to haunt us

- Far more complex than generally recognised.
- Due to way demographic transition -- natural increase – occurs. While international migration has an impact on ASTs of small states (say <2mill) not so for larger states*.
- Differences due to wide range of factors; some theories may not apply (cf large Asian Muslim countries and large Arab Countries – Asian less turbulent ASTs than Arab^)
- *^ Tiny Gulf States vs larger Arab States, see Pool (2012) "Demographic Turbulence in the Arab World: Implications for Development", *J Peacebuilding and Development*, 7,1

Knowing and Managing the Inexorable

- Critical factor is speed of fertility declines, and, in extreme cases (eg Great Leap Forward Years of China or War years of Russia), high mortality. We can't turn this history back*.
- Eg India, with a slower fertility decline, has a more gradual AST than China*.
- Thus, no way to stem effects – cohort flows are in train and are inexorable processes. Instead must understand them better and manage what is occurring.

- * Tuljapurkar, Pool and Prachuabmoh (eds) (2005) *Population, Resources, Development*, Springer
- * Pool, Wong, Vilquin (2006) *ASTs: Challenges for Development*, CICRED (Paris)