

**LOW FERTILITY AND LOW MORTALITY:
OBSERVABLE REALITY AND VISIONS OF
THE FUTURE.**

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Low Fertility: A View from the Past

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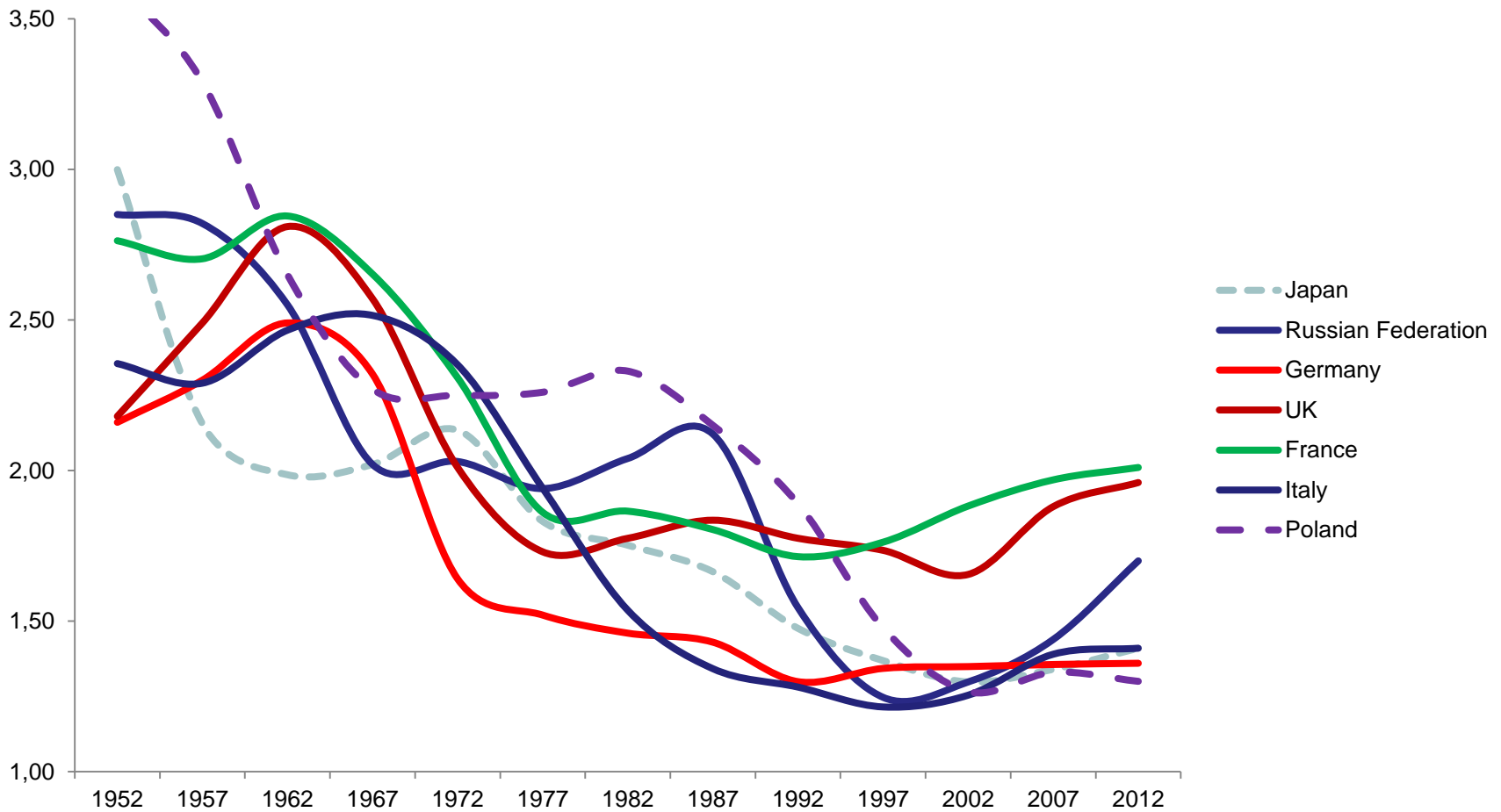
Johann Peter Süssmilch (1707-1767)

“Die göttliche Ordnung”, 1741

- Chapter 5, & 80:

“We will see, therefore, that each couple has a certain number of children and that, on average, we may attribute 4 children to a married couple. If this average were lower in such a way that each family had only three children or if the disordered behavior of men lowered marital fertility at this level, multiplication of mankind would be impossible” [from the “Edition critique” de l’INED, Paris, 1979]

Total Fertility Rates in 6 European countries and in Japan, 1950-2012



From Webster's Dictionary

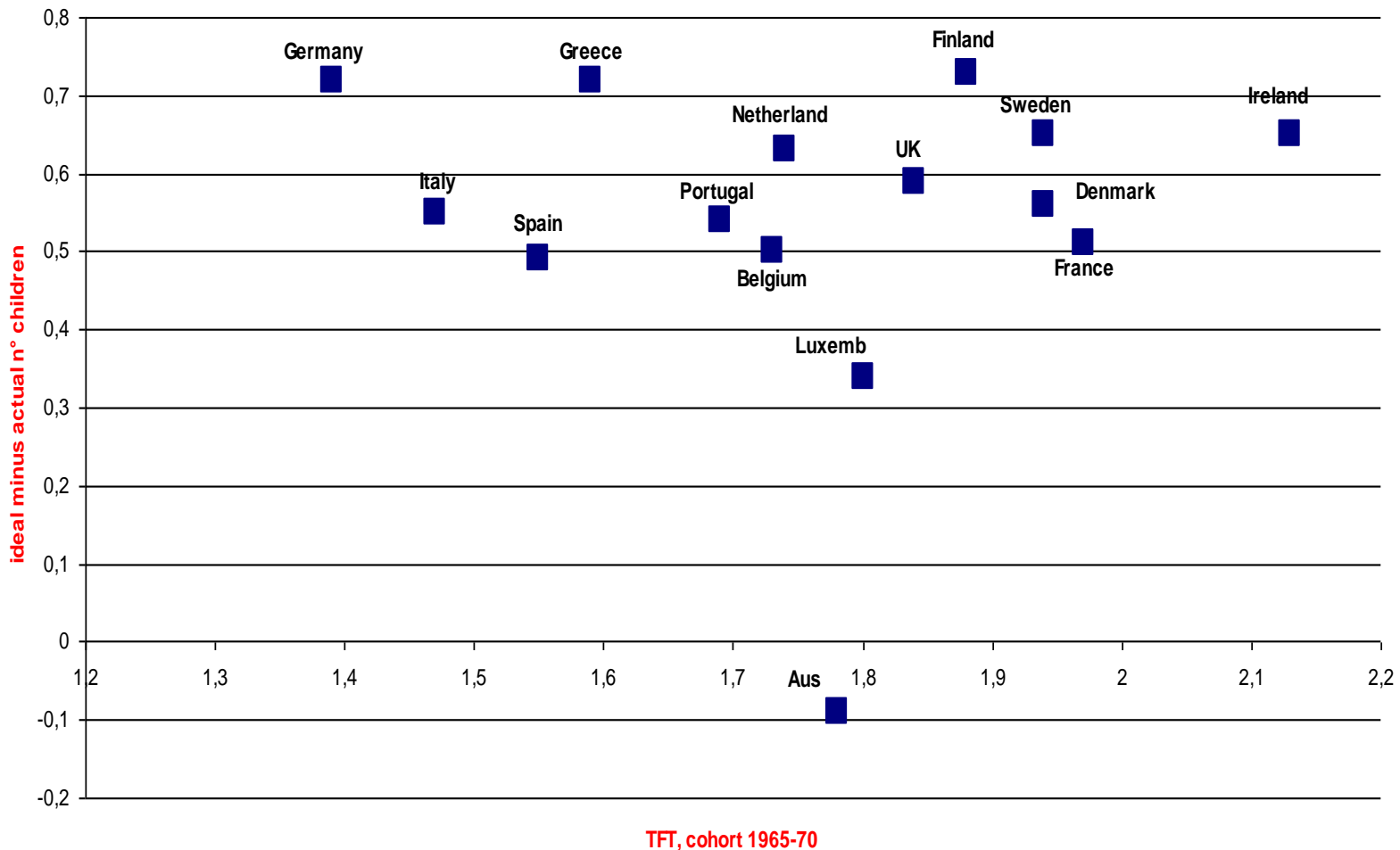
- **Fertile**: producing or bearing fruits in great quantity: *Fertility* implies the power to reproduce in kind or to assist in reproduction and growth
- **Reproduction**: The act or process of reproducing; *Reproduction* implies an exact or close imitation of an existing thing
- **Replacement**: implies a filling of a place once occupied by something lost, destroyed or not longer usable or adequate

Low Fertility for whom?

- **For the individual, the couple, the family:** less children than expected: *ideals, preferences, expectations are frustrated;*
- **For the clan, the group:** strategies, targets are thwarted (*opposite examples: aristocracies, landowners vs proselytizing groups; migrants in rural setting vs migrants in urban-industrial contexts*)
- **For nations, states:** *diseconomies are generated*
- **For demographers:** *Low fertility: $R(0) < 1 \dots$*

Actual TFR (cohort late 60s) and personal ideal 25-39 (2006)

Ideal and Reality



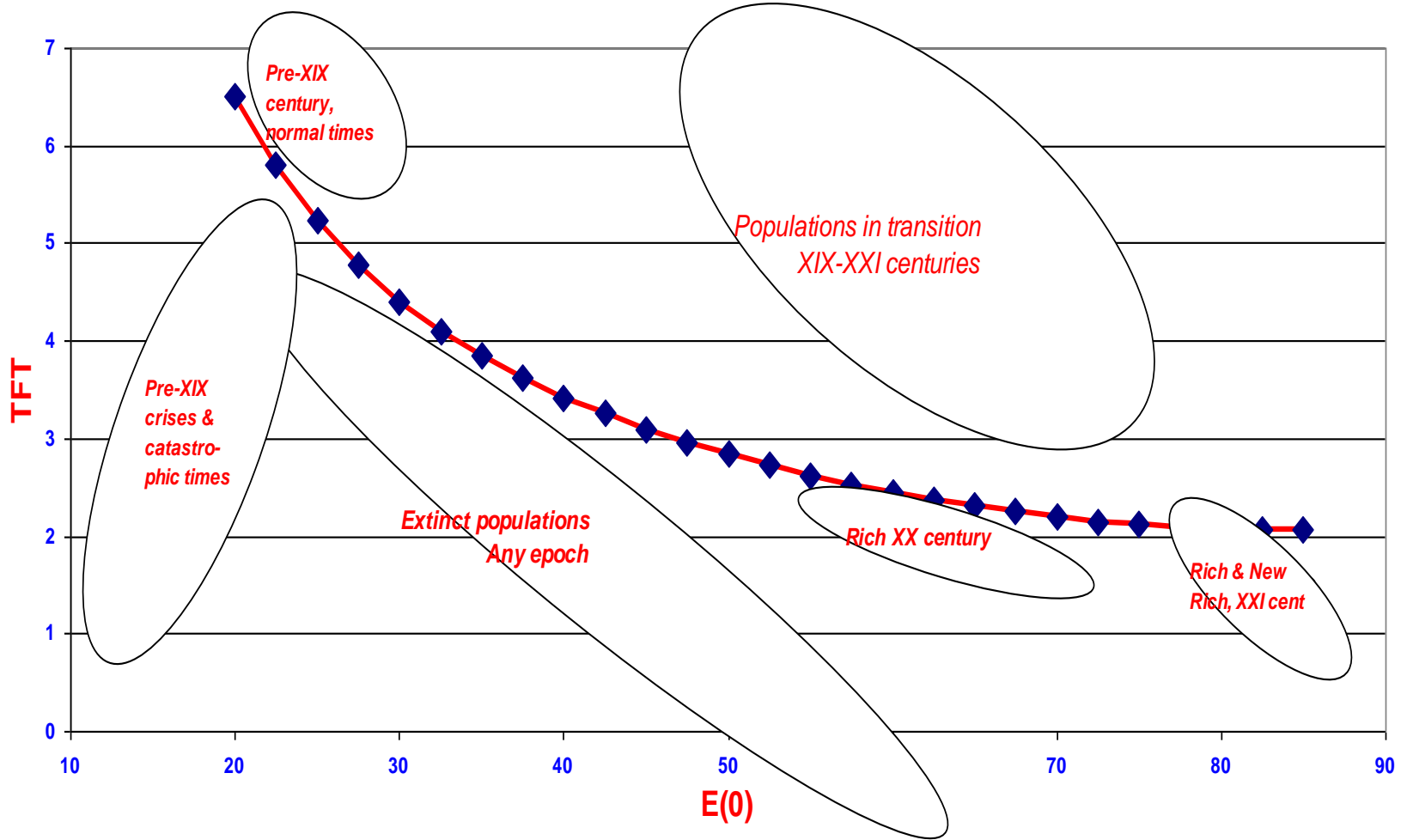
For Groups: different strategies, different concepts of low fertility

- **Aristocracy, Elites:** One surviving son (or daughter) for transmission of property, land, title;
- **Migrant groups on the frontier,** land available (neolithic demic diffusion; Drang nach Osten, American frontier...): large offspring-labor force;
- **Migrant groups in urban-industrial contexts:** small families enhance fitness, mobility, increase chances of success;

For Nations and States: Different Concepts of Low Fertility

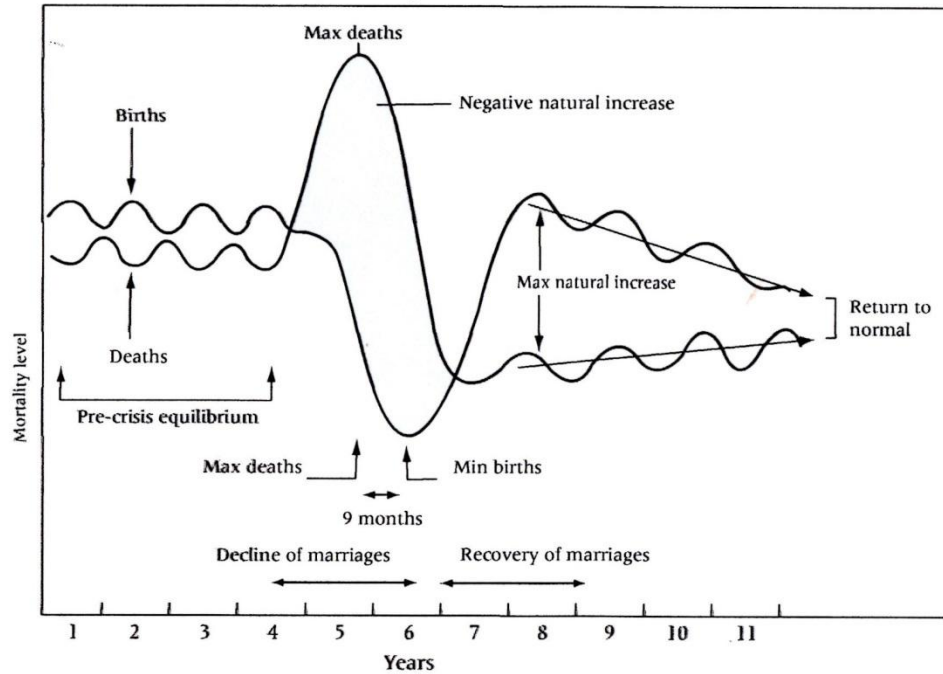
- **“Window of Opportunity”**, **“Demographic dividend”** during the transition: declining dependency rates, the lower fertility is, the higher the dividend;
- **Negative externalities** of low fertility after the transition: economic (transfers between generations; health, pensions...)

TFT and $E(0)$, $r = 0$



Low Fertility during a Crisis

FIGURE 3 Paradigm of mortality crisis



Low Fertility in a Crisis: Why?

Involuntary:

deaths, disease, (separation of couples),
denutrition & loss of libido; malnutrition &
loss of fecundity; abortion...

Voluntary:

marriage deferred, (separation of couples);
willful control, induced abortion...

Rebounds & adjustments (I)

- **After a crisis: «rebound» as exemplified in slide, and realignment on the structural «demographic system»**
- **Examples of rebounds: after a typical «ancien régime» mortality crisis; after a war (First and Second WW); after «modern» mortality crises (Great Leap Forward: USSR 1932-33; China: 1959-61)**

Rebounds & adjustment (II)

- **«Adjustment» after a crisis or catastrophe implies convergence towards a different demographic system. Tempo is an important variable.**
- **Europe after the XIV-XV c. plague cycle;**
- **America after contact with Eurasia;**
- **Japan XVIII-XIX century («malthusian adjustment»);**
- **Ireland after the Great Famine («malthusian adjustment»)**

Ireland after the Great Famine, Second Half of the XIX Century

- **Population decline: 1841: 8.2 million;
1861: 5,8; 1881: 5,1; 1901: 4,4;**
- **Steady and high emigration;**
- **“European system”: high natural, marital
fertility; very late marriage; high
proportion unmarried; low TFR and NRR;
birth rate around 25%° (35%°in England &
Scotland)**
- **NRR 0,8 – 0,85**

Japan: XVIII and XIX century

- Low population increase between 1720 and 1870 (0,2%);
- Intensification of agriculture, increased working load on women “must have had unfavorable effects on marital fertility, as well as non infant and maternal mortality....”[O. Saito, 1992]
- Evidence of intentional control of reproduction
 - Abortion, infanticide;
 - Lesser role of delayed marriage;

Demographic Systems vary around the world...

- In pre-modern Europe and China, TFR was similar, generally between 5 and 6;
- But marital fertility much higher in Europe (TMFR₂₀ normally above 8) than in China (TMFR₂₀ below 6);
- In pre-modern Europe differences in access to marriage (e. and w. of the Trieste-St Petersburg Hajnal's line), and in marital fertility were key factors determining growth;

Did pre-modern Europe ever experience low fertility? The case of England

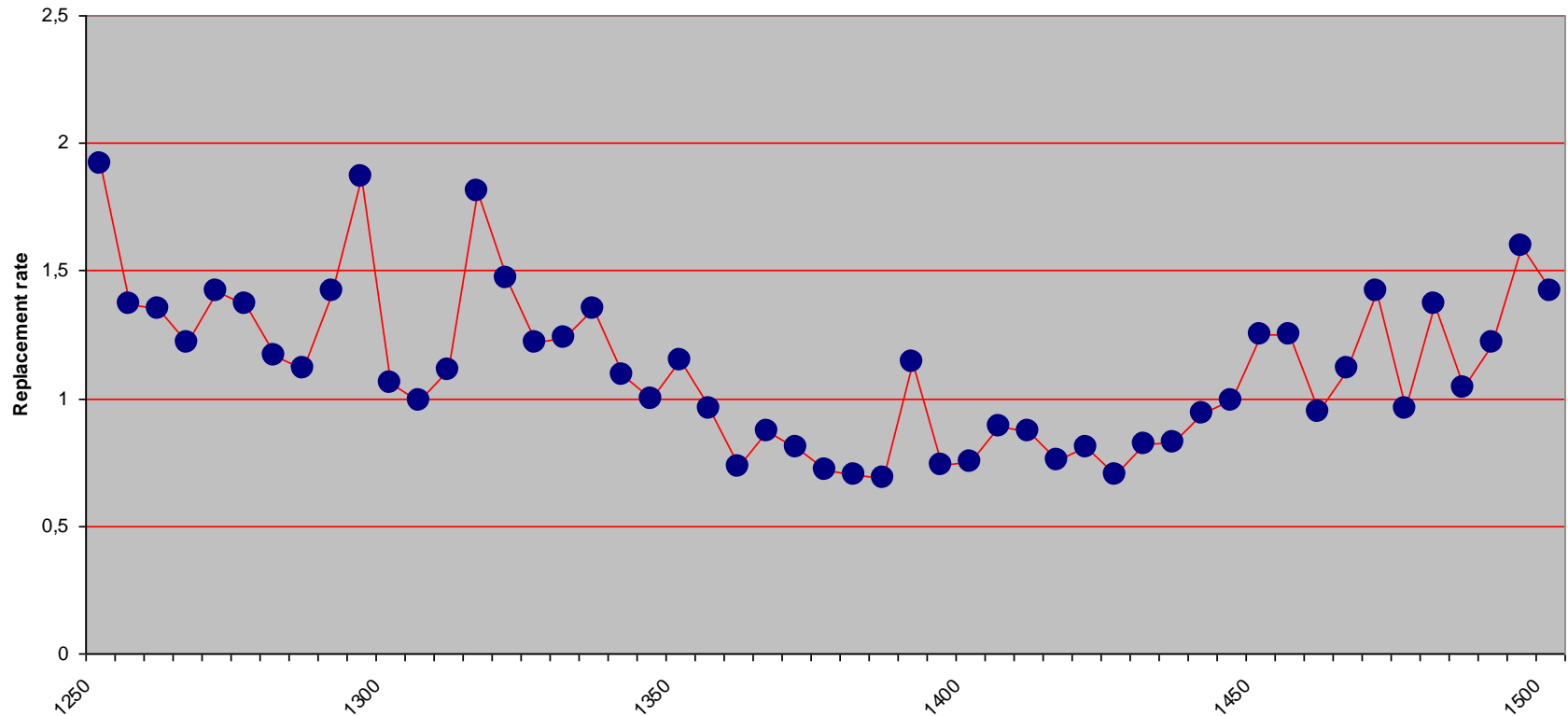
[Wrigley & Schofield, 1981]

- In only 6 out of 67 five-years periods, between 1541 and 1875, NRR fell below replacement.
- 4 of the 6 below-replacement quinquennia fell between 1661 and 1685:
- Relevant indicators for 1661-85 were:
- TFR = 3,91; GRR = 1,91; NRR = 0,945
- r (intrinsic) = -0,19 percent

Only during the plague was England below replacement ! [cohorts in midlife between 1335-39 and 1425-29]

[Russell, 1948; Hollingsworth, 1969]

Replacement Rate, English Men



Hispaniola: Repartimiento of 1514 (first American Census!!!)

[Arranz, 1992, Livi Bacci, 2003]

- **Concepcion:** 949 men, 786 women, 217 children; ratio men to women = 0,828;
- *ratio children to women = 0,276;*
- **Puerto Plata:** 128 men, 108 women, 34 children: ratio men to women = 0,843;
- *ratio children to women = 0,315*
- ***Ratios consistent with stable population declining at 3.5% per year***
- High mortality a possibility; but also sterility, separation of couples, general dislocation

Mexico: “Suma de Visitas” 1548

[Cook & Borah]

- Data for 252 districts, out of the 900 of the “Suma”
- Range of the ratios between “mozos & muchachos” [children and youngsters] and “casados” [married couples]: **1,3-1,6 [high range; ratio compatible with stationary population, 1,9-2,0];**
- ***Reproduction below replacement; steady decline of Mexico’s population during the first half of the XVIth Century***

30 Missions of Paraguay, 1640-1767

[Livi Bacci, 2005]

- *Steady increase, 1640-1732;*
- *Decline after 1732: catastrophic war, epidemic crisis (1733, 1738-39, 1749, 1764-65)*

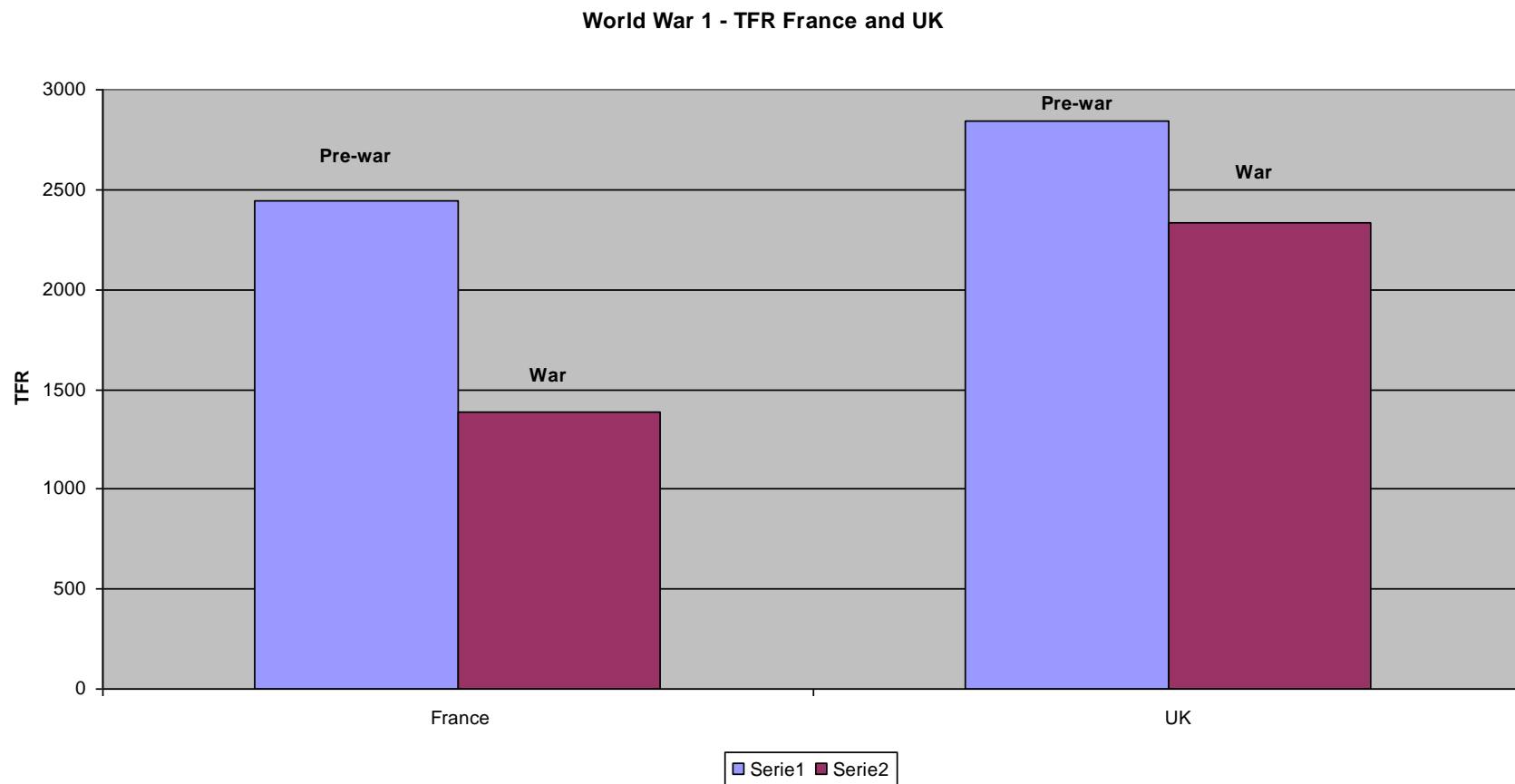
“Expansion” phase, 1690-1732:

- Mean CBR = 63,2; Mean TFR=8,0 [7,9]
- Mean CDR = 45,1; Mean $e(0)$ =26,0 [27,1]

“Catastrophic” phase, 1733-1767:

- Mean CBR = 56,9; Mean TFR=7,6 [7,5]
- Mean CDR = 61,4; Mean $e(0)$ =22,2 [24,3]

Pre-war (1910-14) and War (1915-18) Fertility, France and UK

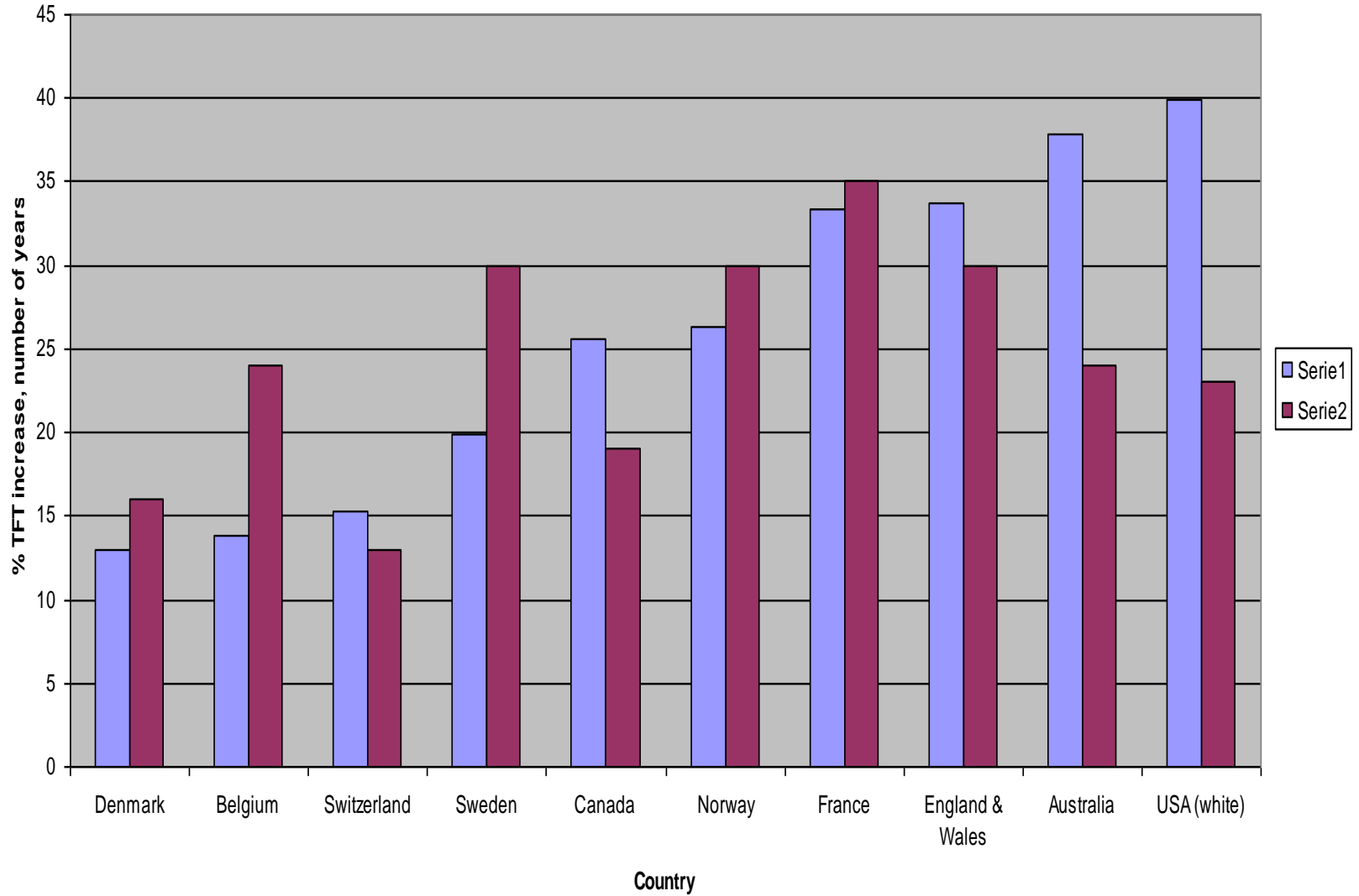


Western Baby Boom, XXth Century

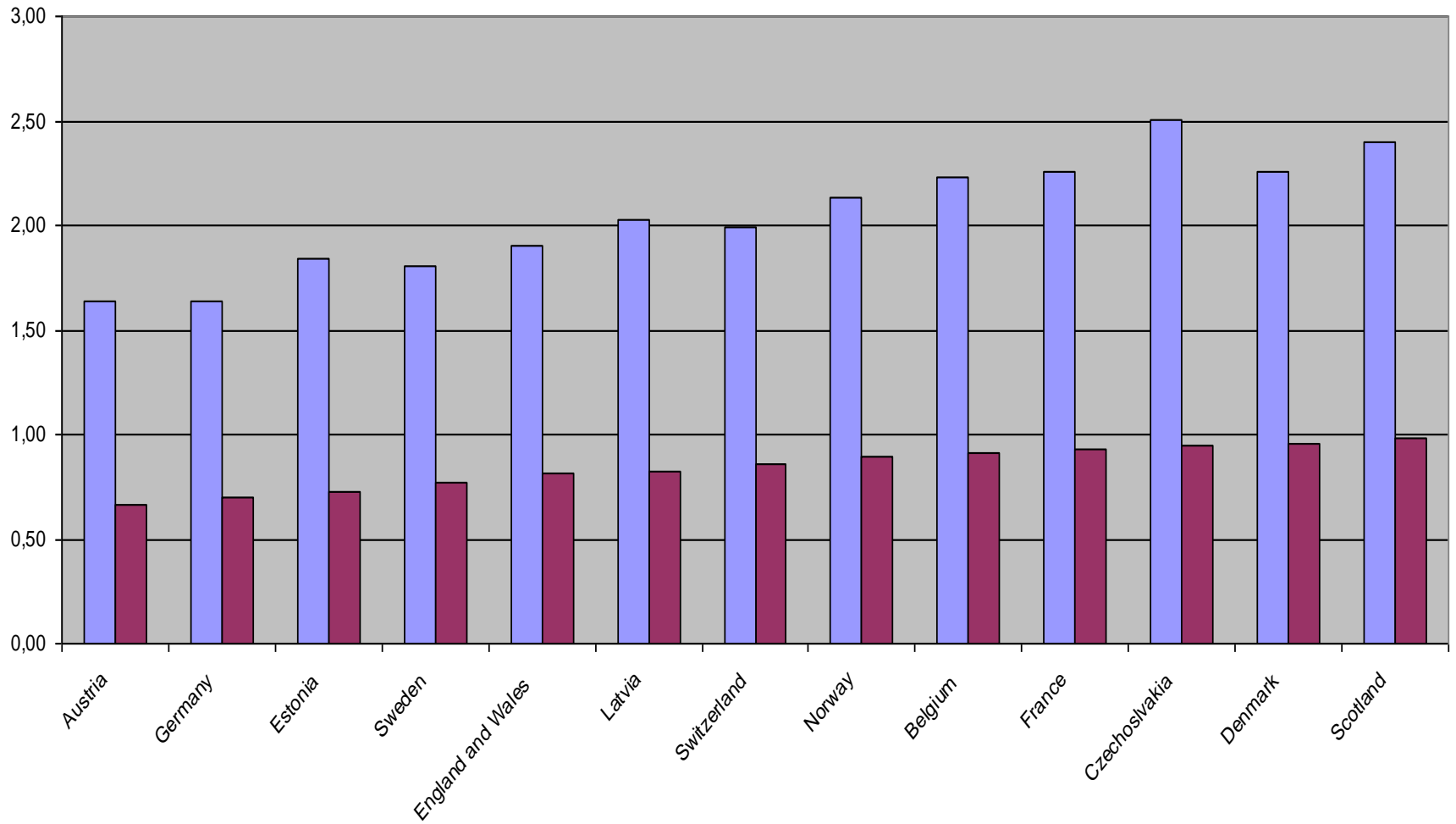
Cohort TFR [*Festy, 1979*]

- 10 Countries (Australia, Belgium, Canada, Denmark, England & W, France, Norway, Sweden, Switzerland, USA)
- Min TFR: cohort born 1906 (average), 2,01
- Max TFR: cohort born 1930 (average), 2,65
- Increase of TFR = 0,64 = + 26,1%
- Duration of Baby boom : 24 years

TFT increase from min to max

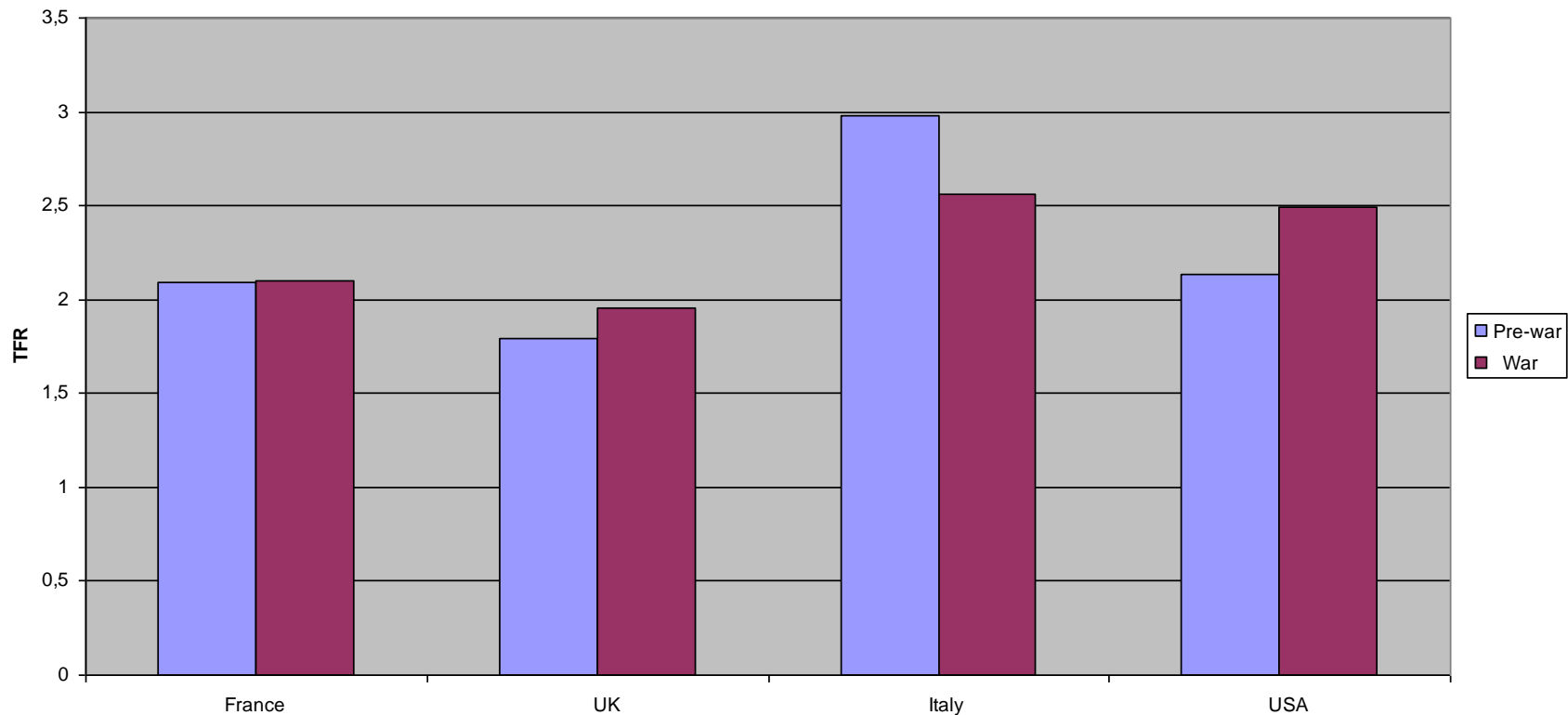


Europe Below Replacement, Early 1930s



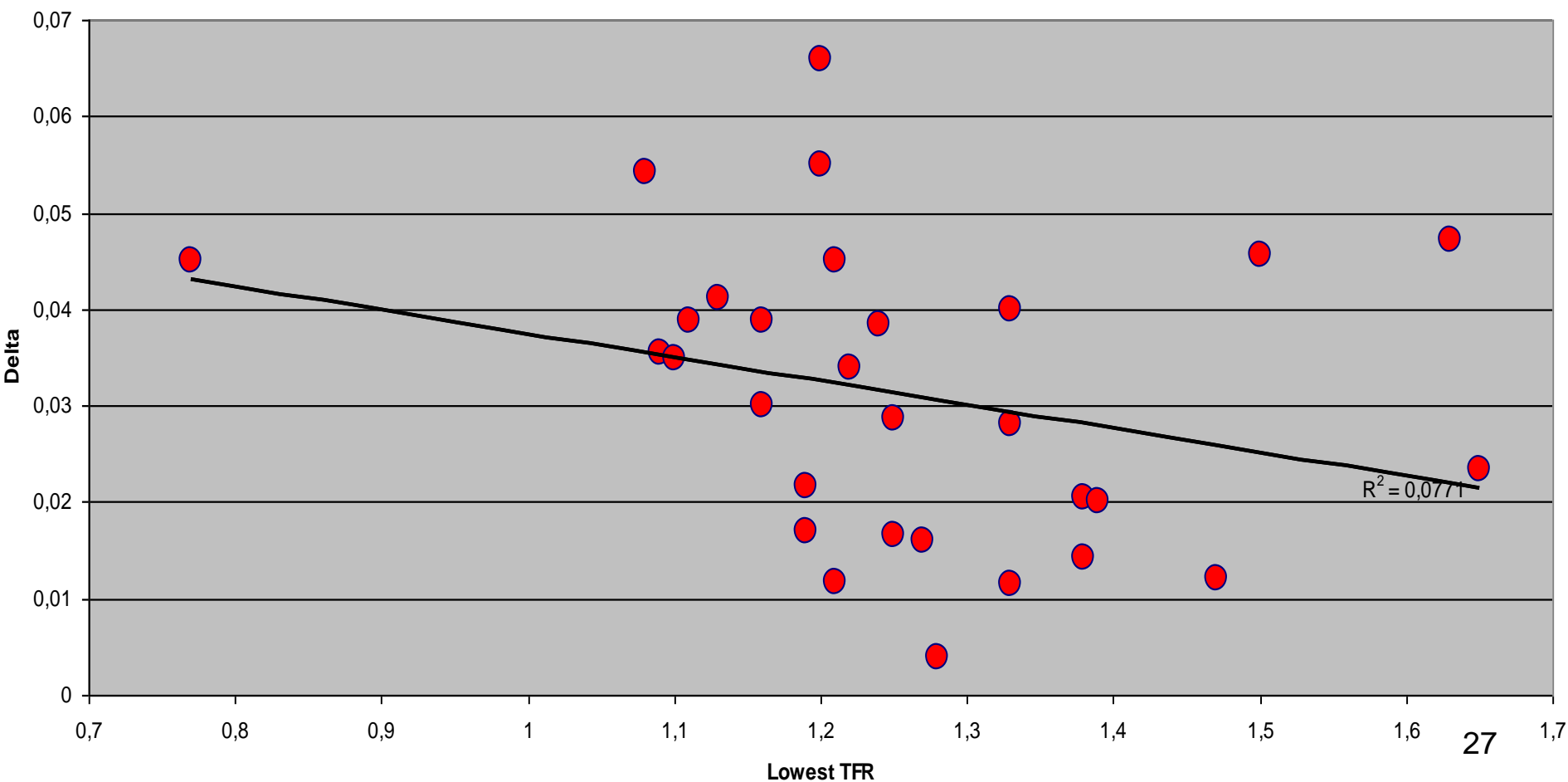
Pre-war (late 30s) and War (early 40s) Fertility (TFR)

TFR- Pre war and war years



Lowest TFR, 30 European countries, increase between lowest and 2008 (per year)

Lowest TFR and Delta



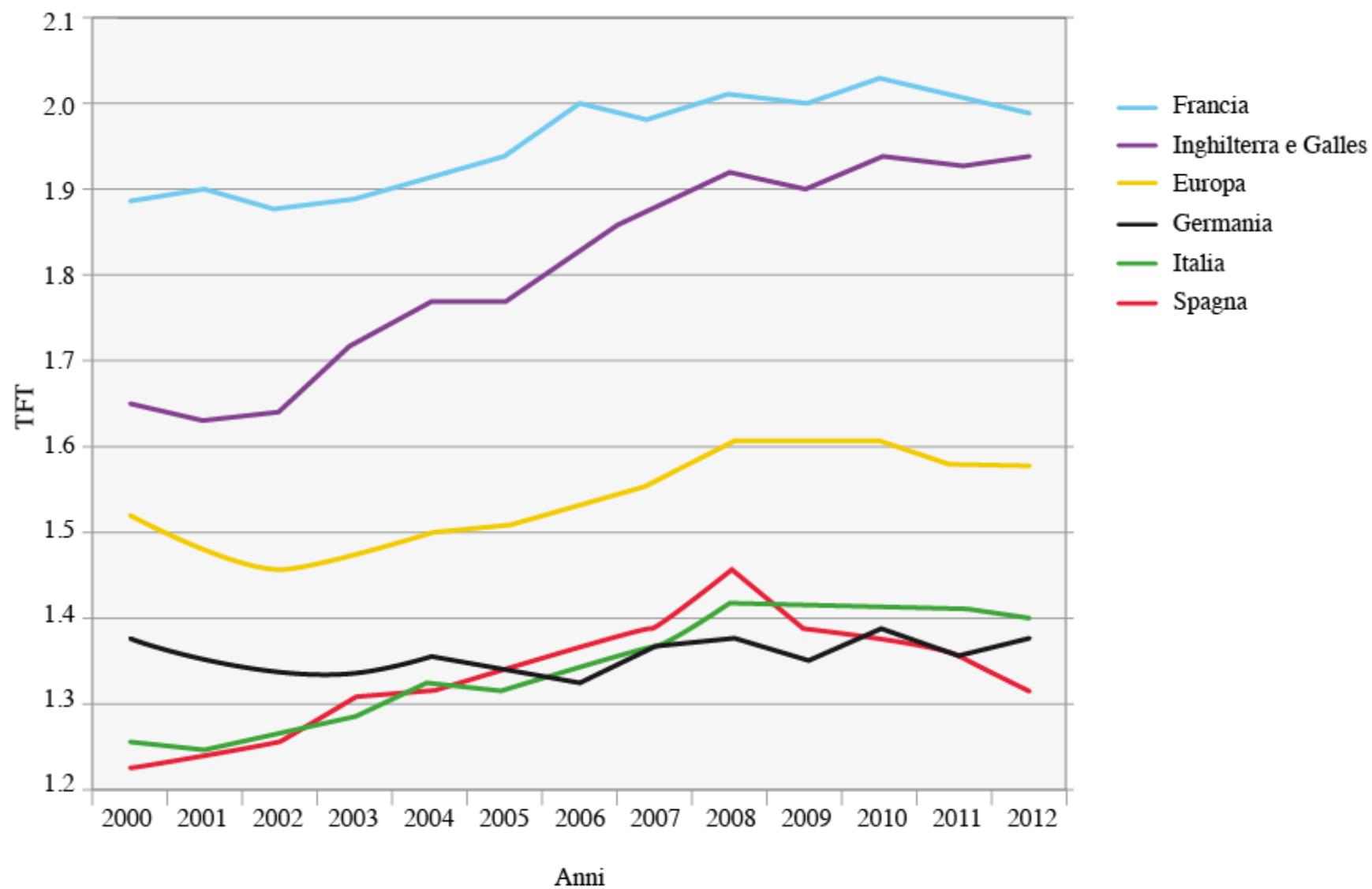
Recent weak rise of fertility

- As for the recent upturn of fertility in Europe, a careful demographic analysis that assessed the role of tempo and parity distortions assessed that *«there was little or no increase in the level (quantum) of fertility between the late 1990s and 2008. while most of the observed TFR rise can be attributed to a diminishing pace of the postponement of childbearing»* [Bongaarts & Sobotka, PDR, 2012]

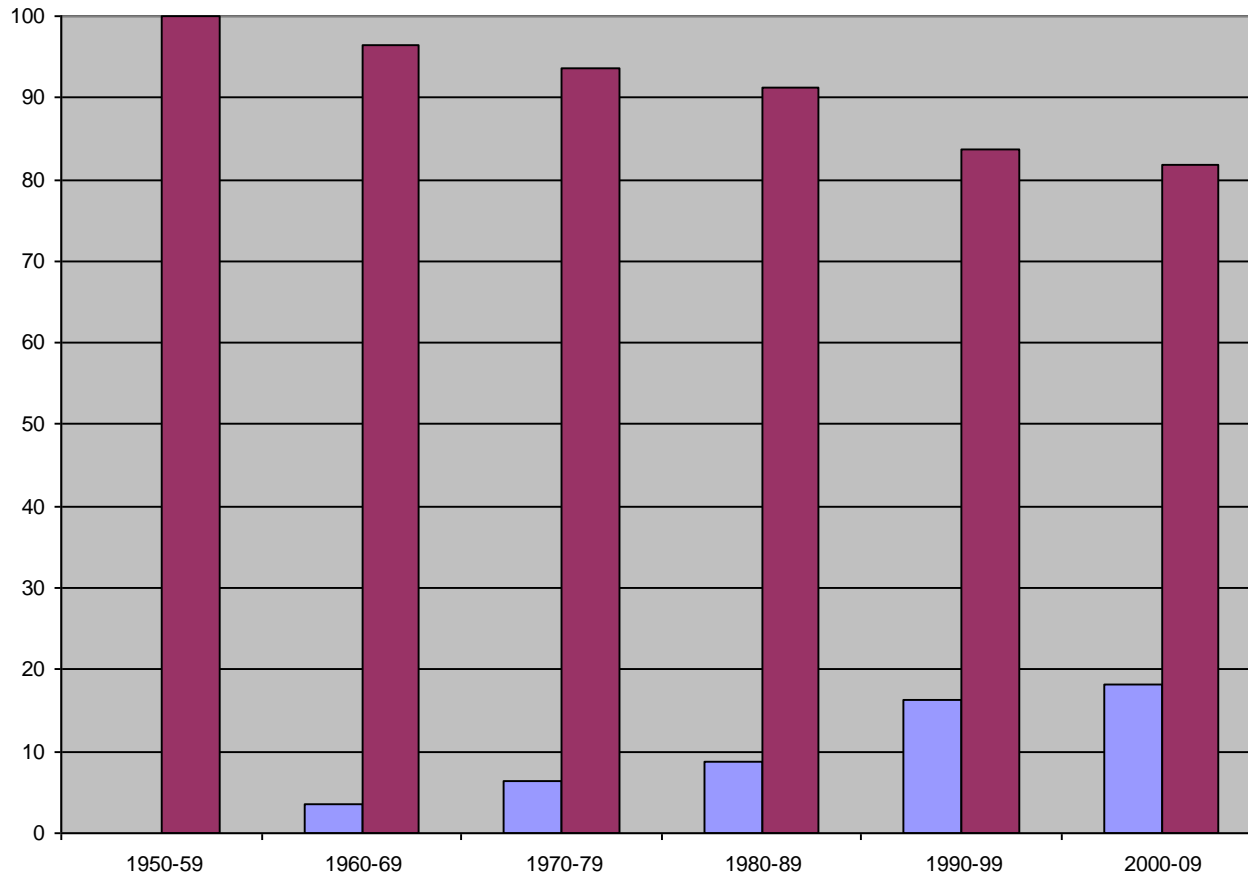
TFR, Weak Rise and Crisis

• Country	2000	2008	2011
• France	1,89	2,01	2,01
• Germany	1,38	1,38	1,36
• Italy	1,26	1.42	1.40 (2012)
• Spain	1,23	1,46	1,36
• Poland	1,37	1,39	1,30
• Netherlands	1,72	1,77	1,76
• Sweden	1,54	1,91	1,90
• UK	1,64	1,96	1,96
• Russia	1,25	1,40	1,61 (2012)

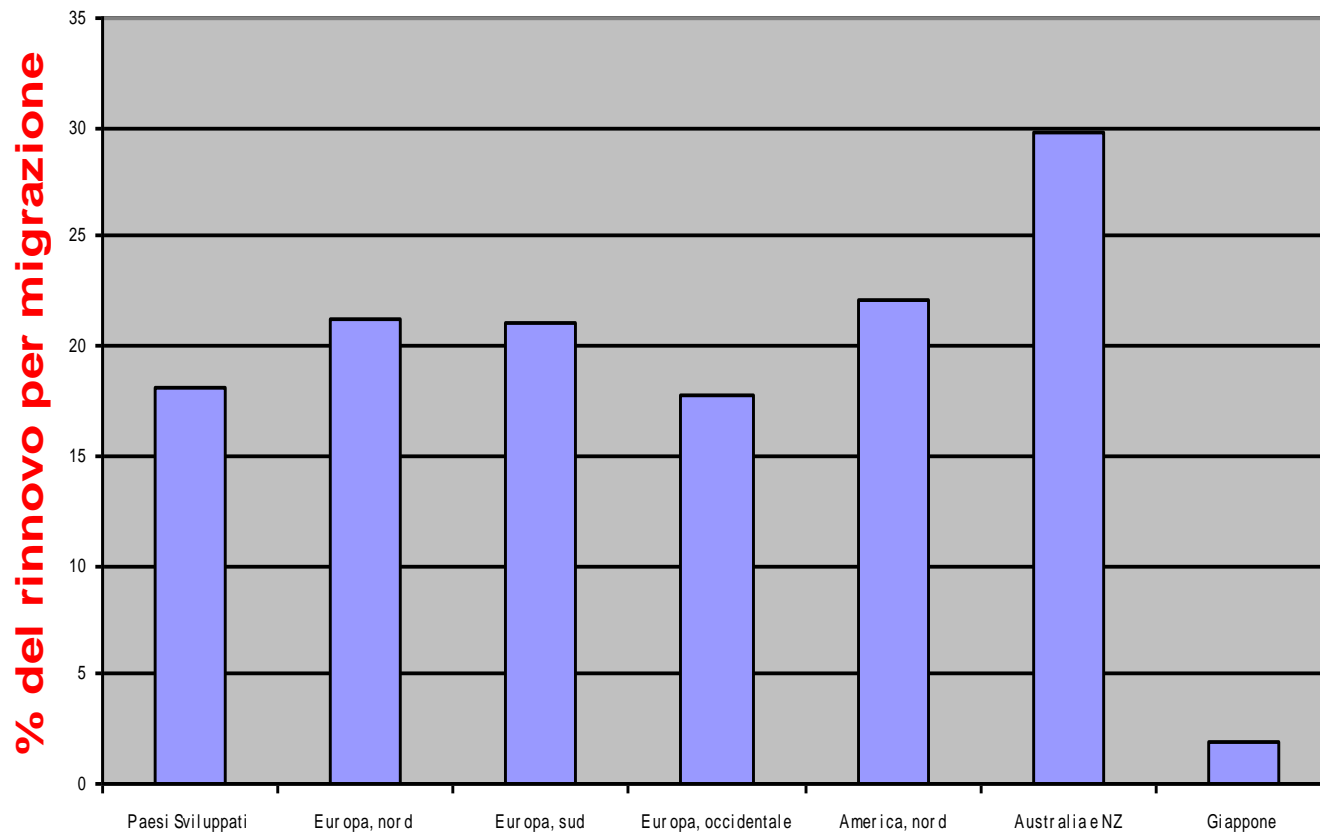
Figura 1 - Numero medio di figli per donna (TFT) in Germania, Francia, Italia, Regno Unito e Spagna, 2000-2012



Biological (Births) and Social (Migration) Renewal of “Rich” Countries, 1950-2009



Social (migratory) Renewal as % of Total Renewal, “Rich” Regions of the World, 2000-09



Concluding Remarks (I)

- *In the history of mankind the powerful driving force has been mortality. Fertility has always been an extremely robust and resilient characteristic of past populations. Only the destruction of the foundations of fertility (a lack of mating opportunities; separation of couples; loss of libido or decrease of fecundity because of infections, hunger or stress) ever resulted in a seriously diminished and insufficient reproductive capacity.*

Concluding Remarks (II)

The current fertility slump differs from past fertility crises: no destruction of fertility foundations has taken place;

No major mechanical or automatic rebounds are to be expected;

The slump affects societies widely different for history, culture, wealth;

In contemporary societies, having few children is a «convenient» individual choice...

...but generates diseconomies at the aggregate level that public transfers are unable to compensate;

Intergenerational solidarity has been weakened and must be restored.