The "Low Fertility Trap" Hypothesis, Extended Abstract

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Extended Abstract

It has recently been observed by Peter McDonald that there tend to be two distinct groups of low fertility countries, those where the TFR has stayed above 1.5 and those where it has fallen below this critical level and stayed below (McDonald 2005). There are currently 28 countries below 1.5 and a recent UN compendium on national population policies indicates that the governments of each of these countries consider this level of fertility too low (UN 2003). McDonald hypothesizes that it is more difficult for a country to bring fertility up to say 1.6 once it has already fallen to levels of 1.3 or 1.4 than to keep fertility around 1.6. From this assumption he derives the policy recommendation that countries should make efforts to keep fertility above this critical level of 1.5 and not let it fall below.

The assumption of a non-linear dose-response relationship in the field of possible policy impacts on fertility levels is a welcome addition to the rather uninspired literature on what level of fertility is considered "too low" and how governments may in turn try to influence fertility levels. One can further elaborate on this hypothesis and try to identify non-linear feedback mechanisms that result in a bifurcation process that makes a level of period TFR around 1.5 some kind of a watershed between different demographic regimes. Once this Rubicon is transgressed it will be difficult to reverse this regime change. Recent work by Rindfuss et al. (2004) on social transitions in Japan supports this assumption of non-linear, self-reinforcing processes in social change with thresholds and tipping points.

Is it justified to call this possible mechanism of irreversible (or hardly reversible) regime change a "trap", a notion that neither McDonald nor Rindfuss use? If a trap is defined as an unpleasant situation (governments would rather see higher fertility) into which one enters unintentionally and of which is very difficult to get out, then indeed the described demographic regime change may be called a trap. But in addition to postulating the possibility of such a tipping point in fertility, it would be good to be able to identify and describe the possible mechanisms that would constitute such a self-

reinforcing process toward lower and lower birth rates and consequently accelerating ageing and shrinking that is difficult to escape. In the following we will describe three such mechanisms, a demographic, an economic, and one related to social norms.

The demographic process refers to the well studied but in the public discussion still not fully appreciated phenomenon of negative momentum. This simple consequence of the dynamics of age structured populations implies that as a result of low fertility over the past years, fewer and fewer women (potential mothers) will be entering the reproductive age in the future and exert a significant downward pressure on the absolute number of births and the crude birth rate. It has been estimated that several countries and the EU as a whole have recently entered a period of negative population momentum, which technically is defined as an age structure implying future population shrinking even in the case that fertility instantly increases to replacement level (keeping mortality constant and assuming no migration) (Lutz et al. 2003). With historically given age structures, this negative momentum is an independent force toward fewer and fewer births in the future. The lower the fertility rates in the near term future, the stronger the force of negative momentum in the longer term future. While this demographic component of the "low fertility trap" is purely an accounting effect at the aggregate level, the following two mechanisms relate to behavioral aspects.

The economic mechanisms that could lead to a downward spiral in fertility from one generation to the next can be derived from the first part of Easterlin's relative income hypothesis which postulates that family size results from the combination of aspirations for consumption (which are largely formed in the family of origin) and expected income (Easterlin 1980). According to Easterlin the baby boom in the 1960s resulted from the combination of low aspirations (parents of the baby boomers were relatively poor) and high economic growth during the 1960s leading to high expected income and general optimism. This rationale can also explain the subsequent fertility decline as a combination of significantly increased aspirations in the next generation together with a less optimistic outlook. Disregarding the second part of Easterlin's hypothesis in which he assumes that expected income is a function of cohort size which results in the unsubstantiated expectation of a second baby boom, one can directly apply this (first part of the) relative income argument to current

and future fertility. Aspirations of young people seem to have been continuously rising over the past decades as a consequence of increasing parental wealth, high consumption standards communicated by the media, and possibly even smaller family size (youngsters have to share with fewer siblings) while at the same time the longer term economic outlook has been darkening due in part to the prospect of demographic ageing. As documented in youth surveys around Europe, the expectations of people entering the labor market today are not rosy. Youth unemployment still tends to be high in many countries (despite smaller cohorts entering the labor market); there are fewer secure jobs; and recent steps towards reducing all kinds of social security (even if they have been rather minor so far) have given rise to a rather pessimistic view that things can only get worse for the younger generation. In contradiction to the second part of Easterlin's hypothesis which postulates positive effects of small cohort sizes, recent findings from global surveys suggest that fewer younger people means fewer start-ups of new enterprises and fewer jobs, as peak entrepreneurial activity takes place in ages 25-44 (Global Entrepeneurship Monitor 2004). Moreover, firms may move away from areas with smaller young cohorts, as there will be fewer potential workers available (Shimer 2001). Hence the economic story of the "fertility trap" argument would go as follows: Lower fertility leads to faster population ageing and thus to stronger cuts in the welfare state, less job creation, and an expectation of lower economic growth in the future; at the same time, aspirations for personal consumptions are still on the rise due to parental wealth and fewer siblings; and the match of high aspirations and low optimism will result in even lower fertility. This assumed mechanism has the potential of a downward spiral with only zero fertility being the bottom.

There is also a plausible mechanism operating in the realms of normative change and ideal family size. If one assumes that the norms and expectations of the younger generation are being formed by what they see around themselves during the process of socialization, then this constitutes a direct feedback mechanism from the family size of the previous generation to the ideal family size of the next generation. Goldstein et al. (2003) have proposed this hypothesis in the context of the appearance of below replacement fertility ideals among the younger generation in the German-speaking countries. Those countries were among the first to experience the decline to very low fertility

levels in the late 1970s and early 1980s which now with a generational lag could influence the norms of today's young potential parents. This hypothesis has found empirical support in a multi-level analysis by Testa and Grilli (2004), who showed with regional European data that – after controlling for a large number of social and economic factors – fertility ideals among the young are significantly lower in areas where the fertility of the parents' generation has already been lower. Assuming that the controls adequately cover regional peculiarities other than level of fertility a generation ago, this finding gives support to the possibility of a downward spiral. This follows the same logic as described by Rindfuss et al. (2004, p. 855): "Changes in attitudes likely create a feedback mechanism, influencing behavior; and changes in behavior likely create a feedback mechanism influencing attitudes." Here the argument would go as follows: Once the number of children (siblings, friends, children seen in other families, media) experienced during the process of socialization falls below a certain level, the own ideal family size would become lower which in course may result in further declining actual family size and still lower ideals in the subsequent generation.

If true, these described possible mechanisms of a self-reinforcing process toward lower and lower fertility do indeed have all the characteristics of what is usually called a trap. Since these kinds of low fertility conditions have never existed in human history before, it is impossible to test empirically whether such "low fertility trap" mechanisms are indeed relevant forces. One can only refer to informed reasoning with an element of speculation. But if the existence of a "low fertility trap" is considered a real danger (and we currently see no reason to rule it out), then the best and safest strategy is clearly to avoid stepping into it and make efforts not to let fertility fall below a certain critical level for an extended period.

We stated above that McDonald's recommendation for governments is not to let the TFR fall below 1.5. But what is the recommendation for governments in countries where the TFR has already fallen below this level? The logic of the argument would suggest that in those cases, fertility should be urgently brought up to above 1.5 before the regime change is complete and irreversible. But is there a magic trick to bring up the TFR by some 0.3 overnight, a new policy that has not yet been tried? This magic bullet may well exist in the form of tempo policies that manage to give period fertility a short

term upward kick. Policies that address the tempo of fertility and stop the further increase in the mean ages at childbearing without necessarily affecting completed cohort fertility could be just the right policy tool to escape a possible "low fertility trap" before it closes.

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Table 1. Results of the five scenarios for Austria, Bavaria and Italy.

	Scenario	2005	2020	2035	2050
Total fertility rate					
Austria	S 1	1.41	1.41	1.41	1.41
	S 2	1.69	1.69	1.69	1.69
	S 3	1.41	1.55	1.41	1.41
	S 4	1.41	1.61	1.49	1.49
	S 5	1.69	1.93	1.78	1.78
Bavaria	S 1	1.36	1.36	1.36	1.36
	S 2	1.62	1.62	1.62	1.62
	S 3	1.36	1.51	1.37	1.36
	S 4	1.36	1.54	1.45	1.44
	S 5	1.36	1.86	1.73	1.71
Italy	S 1	1.24	1.24	1.24	1.24
	S 2	1.51	1.51	1.51	1.51
	S 3	1.24	1.41	1.24	1.24
	S 4	1.24	1.46	1.32	1.32
	S 5	1.51	1.77	1.61	1.6
Births					
Austria	S 1	72,038	62,695	49,350	41,359
	S 2	86,609	76,009	69,809	60,904
	S 3	72,041	67,715	49,930	42,884
	S 4	72,041	70,398	53,188	47,231
	S 5	86,609	86,004	75,048	70,150
Bavaria	S 1	105,283	89,300	69,395	56,496
	S 2	119,303	104,943	88,278	77,811
	S 3	105,283	99,527	67,787	60,039
	S 4	105,283	101,476	71,865	64,513
	S 5	119,303	120,892	92,993	87,652
taly	S 1	489,260	344,013	292,399	212,067
	S 2	595,665	421,158	416,919	316,832
	S 3	489,260	387,157	286,038	223,279
	S 4	489,260	399,019	303,656	243,012
	S 5	595,665	492,987	438,400	368,651
Old age dependency ratio					
Austria	S 1	0.24	0.31	0.52	0.56
	S 2	0.23	0.3	0.48	0.49
	S 3	0.23	0.3	0.51	0.54
	S 4	0.23	0.3	0.51	0.54
	S 5	0.23	0.3	0.47	0.47
Bavaria	S 1	0.24	0.28	0.48	0.49

	S 2	0.24	0.28	0.46	0.45
	S 3	0.24	0.28	0.48	0.48
	S 4	0.24	0.28	0.48	0.48
	S 5	0.24	0.28	0.45	0.43
Italy	S 1	0.28	0.34	0.52	0.69
	S 2	0.28	0.33	0.49	0.6
	S 3	0.28	0.34	0.52	0.67
	S 4	0.28	0.34	0.52	0.66
	S 5	0.28	0.33	0.48	0.57
Population					
Austria	S 1	7,975,335	7,718,934	7,197,142	6,202,044
	S 2	8,036,270	7,941,119	7,708,453	7,017,948
	S 3	7,954,387	7,728,071	7,283,157	6,326,473
	S 4	7,954,387	7,738,721	7,338,575	6,435,905
	S 5	8,036,270	8,040,808	7,905,116	7,329,567
Bavaria	S 1	12,036,100	11,258,753	10,125,841	8,423,244
	S 2	12,094,979	11,586,957	10,719,132	9,334,737
	S 3	12,036,100	11,315,099	10,254,331	8,573,865
	S 4	12,023,897	11,323,467	10,317,856	8,640,079
	S 5	12,096,228	11,667,621	10,920,529	9,663,439
Italy	S 1	56,670,032	52,126,321	46,390,530	39,860,844
	S 2	57,254,477	54,100,986	49,680,383	44,917,031
	S 3	56,670,032	52,417,109	46,966,837	40,428,714
	S 4	56,670,032	52,453,609	47,235,320	40,961,171
	S 5	57,253,746	54,496,983	50,847,809	46,504,488

Table 2. Description of scenarios.

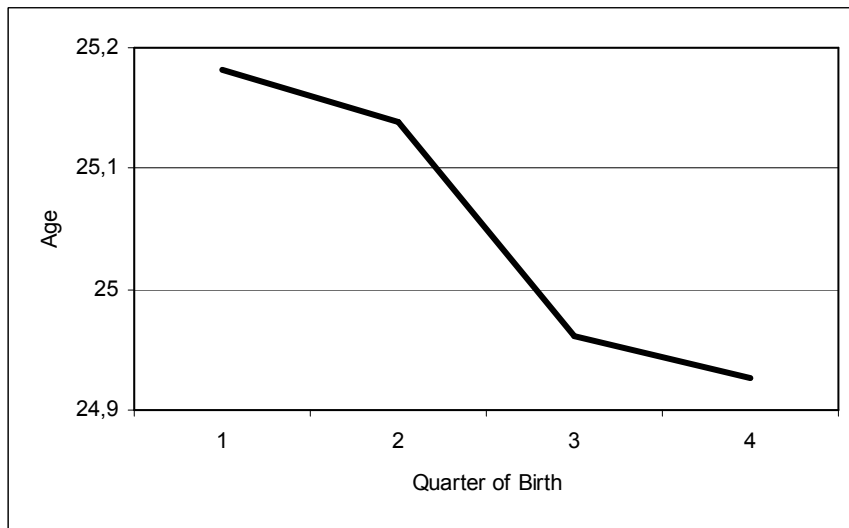| Scenario	Tempo adjustment	Educational reform – 2 years younger school leaving age	Tempo-quantum interaction
S 1	No	No	No
S 2	Yes	No	No
S 3	No	Yes, childbearing shifts 2 years toward younger ages	No
S 4	No	Yes, childbearing shifts 2 years toward younger ages	Yes, cohort fertility increases by 6%
S 5	Yes	Yes, childbearing shifts 2 years toward younger ages	Yes, cohort fertility increases by 6%

Figure 1. Age of mother at birth of first child for Swedish women born 1946-1962.

2a) Total Fertility Rate, Austria

A = School Reform

B = Tempo Adjustment

2 b) Total Fertility Rate, Austria

2 c) Number of Births, Austria
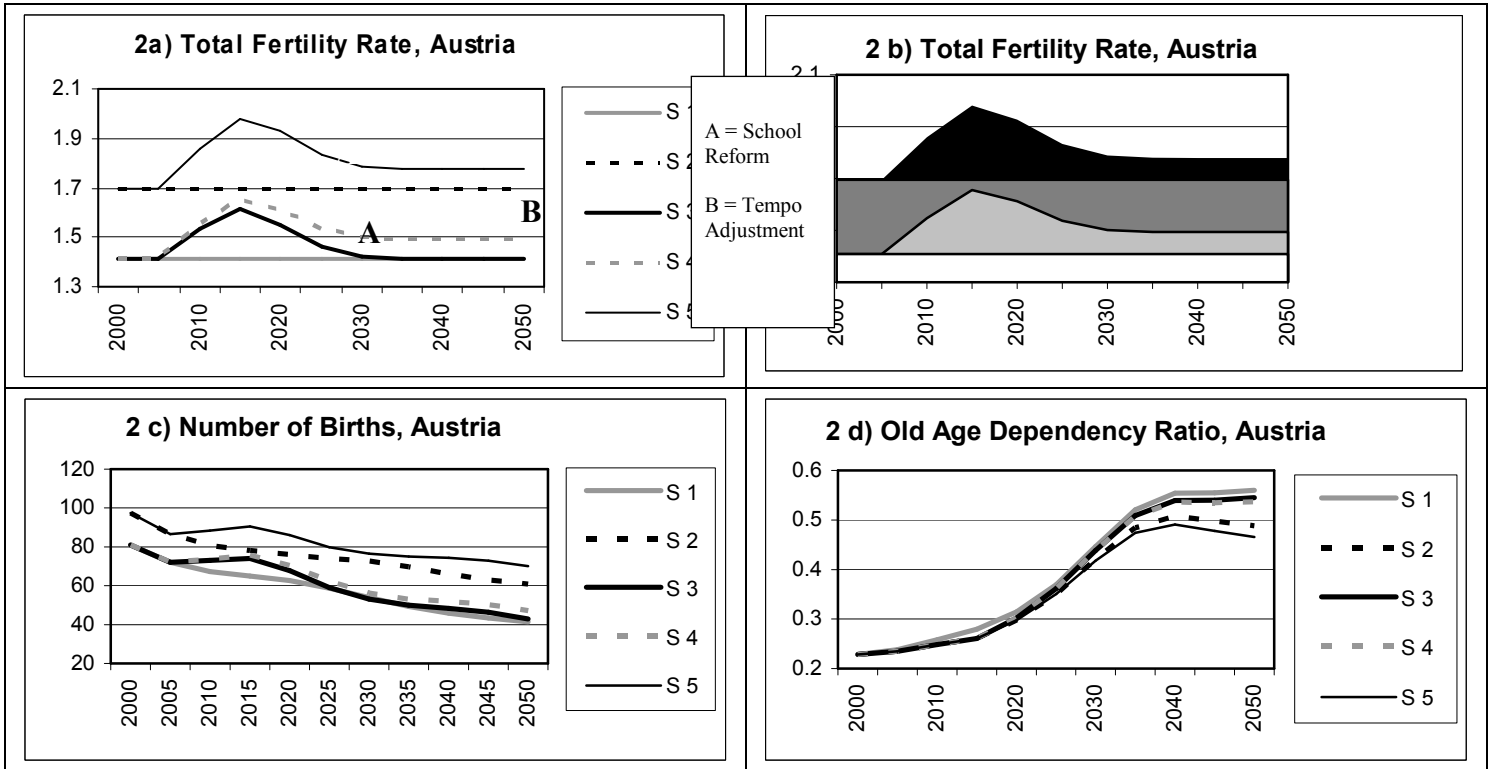
2 d) Old Age Dependency Ratio, Austria

Figure 2. Fertility assumptions under the five scenarios and resulting trends in the absolute numbers of births as well as the old age dependency ratio for Austria.

The "low fertility trap" hyptothesis

This paper concerns the future quantum of fertility in lowest low fertility countries. It starts from the observation of Peter MacDonald that there may be a bifurcation in national fertility trends around TFR of 1.5, with countries falling below this level having a lower chance to recover. This also coincides with the view of Rindfuss et a. concerning possible "demographic regime" changes. Here we discuss two arguments supporting this hypothesis, 1) Ideal family size as a function of the actual number of children experience thus causing a possible downwards spiral in fertility. 2) That following Easterlin's relative income argument, the fertility of the young generation results from the combination of their aspirations for material consumption and their expected income and with the latter declining due to population aging this also implies a downwards spiral of fertility.