

CAN PRO-NATALIST POLICY BE EFFECTIVE?

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Abstract:

The article is concerned with pro-natalist policies, examining empirically their effectiveness. There are proposed four hypotheses: continuous decline of the birth rate; adaptive model; natural-rate hypothesis; crowding-out hypothesis. Nine countries are tested: Germany, Italy, Sweden and France before the World War II and Romania, Bulgaria, Czechoslovakia, Hungary and East Germany during the communism. Best empirical results arise from the crowding-out hypothesis. Good results follow from the adaptive model and the continuous decline of birth rates. The natural-rate hypothesis has small explanatory power. Pro-natalist policies, according to this study, are not too effective.

Keywords: population policy, pro-natalist sentiment, static model, dynamic model, constant decline in the birth rate, adaptive model, natural-rate hypothesis, crowding-out hypothesis

JEL Classification: C22, C52, J11, J13

1. Introduction

While international attention in the 20th century was turning to the problem of rapid population growth in developing countries, birth rates in the advanced industrialized nations resumed their long-term decline after the brief remission of the post-war “baby boom”. In Eastern and Western Europe the fall in fertility has been precipitous, but the same trend has been also visible in North America and Australia. To halt this trend, some governments introduced vigorous pro-natalist policies.

The objective of this study is to examine whether and to what extent pro-natalist policies can be effective. The second chapter deals with the definition and history of population policies. The third chapter summarizes the literature on the effectiveness of pro-natalist policies. The fourth chapter offers a static and dynamic model of pro-natalist policies’ effectiveness. The fifth chapter describes data and brings empirical results.

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2. Population Policies – Definition and History

In order to analyze population policy, we define main demographic terms. The birth rate is understood, in accordance with demographic theory, as the number of born children to 1,000 inhabitants. The fertility means the average number of children to one woman in reproduction age (15-44 years). The fertility can be calculated also in age cohorts.

There has been a remarkable similarity in the timing and patterning of the fertility decline in countries that vary widely in geographical location, religious composition, political system, and economic structure. The downturn in the curve appeared simultaneously in the sixties of the 20th century in all the major nations of Western and Northern Europe (the second demographic transition – see Rabušic, 2001), and just a few years earlier in Canada, the United States, and Eastern Europe.

If reproductive decisions are motivated not only by the conscious desires of individual couples but also by changes in fashion, there is as much reason to anticipate a reversal of the present trend in the future as to expect a continuation of the decline. Nevertheless, because of changes in the norms governing marriage and the family, and availability of near-perfect means of preventing unwanted children, many demographers believe that a spontaneous increase in the birth rate sufficient to ensure replacement of the population is unlikely.

Some scientists took the view that an increasing population was more an economic burden than an asset. Others remained convinced by the view, dominant in the years preceding World War I, that a large and increasing population is associated with the development of natural resources, with progress in every branch of industry, and hence with general prosperity (such as attained in the United States, Germany, and Great Britain). Swayed by this latter view, some countries were considering policies to counteract the advent of zero population growth, or even population decrease.

The procedure adopted here attempts to specify a macro-model that makes possible to testify the effectiveness of pro-natalist policy. The difference from other studies concerning the relation between economy and population (see Denton, Spencer, 1995) is that we regard not only numerically specified models but estimate more or less realistic values of their parameters. The population policies, therefore, are examined not only theoretically but also empirically.

2. 1 *Definition of Population Policies*

European nations, including some in the West, introduced a variety of measures intended to stimulate fertility. Not all of these efforts amount to population policy as defined in this study. Population policy has been defined innumerable times without the emergence of a consensus on its meaning (see McIntosh, 1983). There are obvious conceptual and methodological differences between an analysis that seeks to understand the population objectives of governments and the means by which they are to be achieved, for example, and one that seeks to assess the impact of governmental behavior on demographic structure and events.

The definition employed here is designed to facilitate the identification of public policies that have been adopted for the purpose of influencing a demographic variable – either fertility or population growth. Implicitly, this definition contains four elements which should be present: a statement on the part of government of its demographic goals; a course of action to achieve these goals; the designation or creation

of an agency to be responsible for implementing the course of action; an allocation of resources to the agency to carry out its mandate.

The study of pro-natalist population policy is additionally complicated by the need to distinguish pro-natalist measures from other social policy instruments. Frequently the distinction lies only in the intentions of government which may be obscure. Governments desirous of raising the birth rate rely to considerable degree on such measures as generous family allowances, maternity grants, assistance with housing, and income tax relief for couples with dependent children, all measures that may also form part of a family policy devoid of any intent to influence fertility. The critical distinction between pro-natalist and family policy is, therefore, that the former is intended to influence fertility.

Demographic trends and conditions are not sufficient to explain why one country will introduce a population policy while another, in similar demographic circumstances, will not. Governmental attitudes toward population growth are important as well as the responses of governments to low fertility. The latter depend on considerations of national power, economic well-being and the role of the state in the society. The policy measures adopted are determined by the extent to which it is considered legitimate for the state to intervene in the reproductive decisions of couples for the benefit of the society as a whole.

Low fertility and declining rates of population growth pose difficult problems for government and society: changes in age-structure and a growing number of elderly dependents, especially the very old, severely strain the financial bases of social security systems. Ageing work forces introduce unwanted rigidities into the operation of labour markets. Exacerbated depopulation of rural areas calls into question the design and implementation of regional development policies.

Notwithstanding their anxieties, governments in the liberal democracies face serious moral and political constraints on their capacity to induce even the modest rate of population growth that would serve, they believe, to prevent the most obviously troublesome consequences of population stagnation or decline. It is also difficult to mobilize political support for expensive pro-natalist measures in a period of financial stringency and high unemployment such as is being experienced today.

Only in some countries, therefore, there were introduced population policies, in strict meaning of the word. The history of population policies involve anti-natalist policies in developing countries, pro-natalist policies until 19th century, pro-natalist policies since World War I, pro-natalist policies since World War II and pro-natalist policies of communist countries. Authoritative regimes seem to be in better position to influence demographic trends because of having political instruments for controlling the whole population.

2. 2 Pro-natalist Policies in Communist Countries

Notwithstanding the similarity of population trends and the evidence of concern about them, the actual policy responses of governments vary markedly. In Eastern Europe, soon after fertility reached replacement level, five of the seven low fertility countries started to implement comprehensive and coordinated policies intended to encourage childbearing. Among Western nations only France, Sweden, Nazi-Germany and Italy were attempting seriously to raise the birth rate.

Birt rates fell dramatically in Eastern Europe in the late 1950s when most of the communist countries followed the example of the Soviet Union and legalized abortion on demand. In these countries, where reliable contraceptives were almost unknown, legal abortion was seized on by women as an important means of preventing unwanted fertility. By the early 1960s, in several countries the number of

abortions performed came to equal if not exceed the number of live births, and gross reproduction rates fell alarmingly.

The demand for abortions was particularly heavy in Romania, where they soon came to outnumber live birth by four to one, and the crude birth rate fell from 25.6 to 14.6 per thousand between 1955 and 1965. The Romanian government's response to what was seen as a demographic disaster was very different from the responses of other East European governments. At the end of 1966, without warning, the governments imposed restrictions which made legal abortions virtually impossible to obtain and, simultaneously, banned the import and local manufacture of contraceptives. At the same time, the Family Code was modified by a decree which stated that marriage could be dissolved only in exceptional cases. The effect of these policies was almost instantaneous, the birth rate more than doubling in the following year.

The responses of Bulgaria, Czechoslovakia, and Hungary were much more characteristic of East European reactions to low fertility. Concerned about future labour force growth as well as the health effects on women of repeated abortion, these countries started early in the 1960s to develop coordinated approaches to eliminate obstacles to childbearing. With some differences in detail and timing, Bulgaria, Czechoslovakia, and Hungary introduced vigorous measures in three broad areas.

First, all three countries placed some restrictions on access to legal abortion, especially in the case of a first or second child. Although the measures were far from draconian, all women seeking an abortion were at least required to appear before a special commission to get permission for the operation. It was felt by some, both patients and commissioners, that this procedure was itself a potent deterrent to legal abortion. While attempting to limit the number of abortions, these countries tried to make modern contraceptives more widely available. Women in Eastern Europe, however, did not yet have such easy access to contraceptive services and advice as did their colleagues in the West.

Second, the series of measures introduced in Eastern Europe were intended to reduce the difficulties experienced by women who had to care for young children while holding a full-time job. In addition to trying to increase the number of places in nurseries and kindergartens, Bulgaria, Czechoslovakia, and Hungary made it possible for women to stay home with a new baby for periods varying from one to three years after the birth. Women received full pay, or nearly full pay for five or six months and then become eligible for an allowance which approximated the minimum wage.

Third, building on the system of maternity and family allowances already in effect before the specifically pronatalist measures were introduced, the all three countries implemented a series of measures designed to reduce the financial burden of children. Again with variations in the details, these countries introduced or increased lump-sum birth grants, family and children's allowances, and low-interest loan for building or buying a house. The various allowances increase in amount for successive children, with the emphasis usually falling on the third child.

East Germany did not fully liberalize abortion until 1972 and did not impose any new restrictions since that date. Throughout the 1970s, however, the government introduced a program of incentives similar to those of Bulgaria, Czechoslovakia, and Hungary, which had some success in raising fertility. In Poland exceptionally rapid population growth in the postwar years prompted the Gomulka regime to introduce anti-natalist measures during the early 1960s. Since then fertility fell almost to replacement level, and before its collapse in 1980, the Giereck government was becoming increasingly convinced of the need to stimulate the birth rate. Assistance to

the family included small family allowances and birth grants, paid and unpaid maternity leave, and loans to assist student marriages.

The Soviet Union was faced with a situation in which subreplacement fertility in the European Countries was offset by high fertility in the Central Asian region. For some time the government wanted to increase the birth rate in the low fertility regions but experienced ideological difficulties in adopting a regionally differentiated policy. The two measures, a lump-sum birth grant and partly paid maternity leave were unlikely to be sufficient by themselves, to make a significant difference in the birth rate.

3. Literature Overview on the Effectiveness of Pro-natalist Policies

There are studies focusing on the effectiveness of population policies directly. At most they are qualitative, a part of them makes effort for quantitative estimations. Estimations on the effectiveness of pro-natalist measures are more or less exact. This chapter summarizes a literature on the effectiveness of pro-natalist policies.

3.1 Effectiveness of Pro-natalist Policies in Communist Countries

Most authors agree that pro-natalist policy influences fertility more in the short run than in the long run. A weak place of the literature, according to my opinion, is that it states the short run increase in fertility arising from population intervention, but it doesn't examine in detail how fertility behaves in the following periods. It is not ruled out that the increase in fertility for the sake of pro-natalist policy crowds out births in following periods.

It is not possible to be satisfied only with the sociological approach to this issue – stating that a per cent of population wishes a population policy. For example, Dorbritz and Fux (1997) in book *Attitudes to Family Policy in Europe* offer a statistical analysis of results of international research European Comparative Survey on Population Policy Acceptance: men and women between 20 and 39 years want more active family programs (bigger social allowances). The authors don't solve the question to what extent these allowances are effective in influencing fertility and give therefore uncomplete view on pro-natalist policy.

According to Andorka (1989), the short term increasing in fertility during fifties of the 20th century in Hungary was caused by a change in timing childbearing: couples that to have children sooner did not have them later. The author is more optimistic concerning the effectiveness of Hungarian pro-natalist policy in seventies of the 20th century. A small increase in fertility was a reality, it lasted, however, only several years and then the decreasing trend continued.

Höhn and Schnubnell (1986) estimated the long-term effect of pro-natalist policies at 0.2-0.3 child per woman in France, 0.1 in East Germany and 0.2 in Romania, while remarking no effects in Czechoslovakia and Hungary. The authors argue that only small part of determinants in fertility are of material nature and can be financially covered by the state. Kučera (2001) is optimistic, and estimates the effect of Czechoslovakia's pro-natalist policy for 180-200 thousands of children that would not have been born, if the decline in fertility from sixties in the 20th century were continuing and the population authority did not intervene.

Communist countries were marked by an extensive population regime – the high number of marriage, high birth rate, high number of divorce and high death rate. After the 1989 all these indicators went down, except of divorces. The communist countries are, in any case, an ideal place for examining the effectiveness of pro-

natalist policy because of experience with pro-natalist programs. Therefore, I use them in my empirical analysis.

3. 2 *Discussion on Population Policy in the Czech Republic*

A population policy in the Czech Republic is discussed by scientists, media, and politicians. The scientific debate takes place in scholarly journal *Demography*, but also in various monographs. While Rychtaříková (1997) evaluates critically the population development during transition and emphasises the social-economic aspects, Rabušic (2001) admonishes the catching-up of reproduction patterns from Western countries, which were in the age of communism braked. Intermediate positions expressed Kučera (2001) and Srb (1997).

Our approach in this controversy supports rather Rabušic (2001). It attempts, however, to give a more deepen theoretical foundation to this issue. The decline in fertility during transition can be explained at best as an imitation of reproductive behavior of couples in Western countries. While Rabušic sees the demographic development as a consequence of cultural changes in young age cohorts, I emphasise the economic dimension of this problem. The economic background is well remarked by Rychtaříková, who sees it, however, in vain negative context.

According to my interpretation, the fall of communism brought the opening of different activities for young people – enterprise, studying, travelling – which were prohibited in earlier time. As a consequence, opportunity costs of children increased and the curve of marginal costs of children shifted. At the same time, opportunity costs of marriage increased and some changes in the marriage market occurred. The number of marriages and births decreased and the price (opportunity costs) of marriage increased.

The argumentation of Rychtaříková (1997) that significant changes in fertility have been remarkable since 1992, and not in 1990 – 1991, and that it is an evidence for the influence of socio-economic drop of young families after the beginning of transition, is not convincing. The short term increase in the birth rate in 1990 can be explained as a product of euphoria after the fall of communist regime. This is an euphoria, analogous to similar processes after falling of authoritative regimes or after the end of a war.

Rabušic (2001) is all right in his opinion that even if the standard of living in first years of transition were increasing, being accompionated with a good housing, the number of marriages and births would decrease. The attractive programs for young couples, assistance with housing, marriage loans and birth grants would possibly brake the process, but could not stop it. The decline in fertility and the number of marriages is related to coming of democratic regime and market economy as it is confirmed by the developments of other countries in Central and Eastern Europe. Everywhere fertility tends to decrease.

The discussion on population policy cannot be reduced to sociological examination about attitudes of young people, although some of them can be inspiring, see Čáková (1999). Sociological understandings of values and subjective attitudes of people are interesting, but don't offer any view on the efficiency or inefficiency of pro-natalist policy. Young people explain in surveys as important causes of declining fertility "bad condition in housing, financial burden arising from educating children, economic crisis and unemployment". It is possible, but this reports about their wishes and interests, not real causes of decreasing fertility.

The economic theory of fertility (see Becker, 1991; Razin and Sadka, 1995) explains motives, why individual couples make reproductive decisions. Increasing opportunity costs of children is an objective fact which an ingenious social or econo-

mic policy would make nothing with. Pro-natalist intervention, although being able to change variables in the short run, cannot change long-term trends in fertility.

4. The Model of Effectiveness of Population Policy

To evaluate the costs and benefits of concrete population policies is hard. To find out the number of children who would not be born if government were imposing a certain policy is possible only by estimation. Even individual couples can have different opinions and feelings to what extent their reproduction decision – the conception, birth or abortion – has taken place due to economic or moral motives (or it was influenced by a social or population policy of the government).

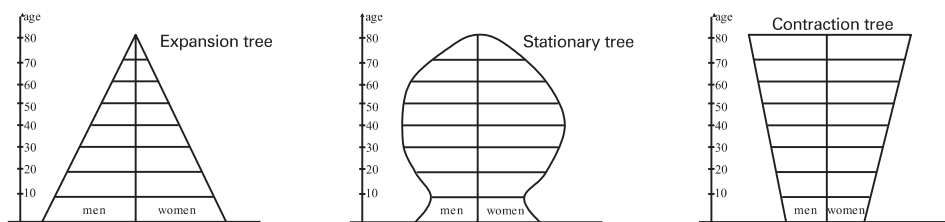
To estimate the effectiveness of a population program in macro-numbers is, of course, more complicated. Even though it is possible to show the participation of a certain per cent of couples in a government program (e.g. using a type of contraceptives or renting a state house), it is not sure whether the couples do not substitute private sources for planning family, consumption and investments into human capital of children by public sources.

To examine the effectiveness of a pro-natalist policy we have developed a model of a stationary population having the birth rate and the death rate the same, and have given into it a factor of population policy. In the second stage we enriched the model by an independent variable – the permanent decline in fertility, which is in time of some decades a realistic assumption and makes it possible to testify the model.

4.1 Stationary Model

The population policy's effect can be described by a life-tree known from demography. There are three types of the life-trees: expansionary, stationary and contractive.

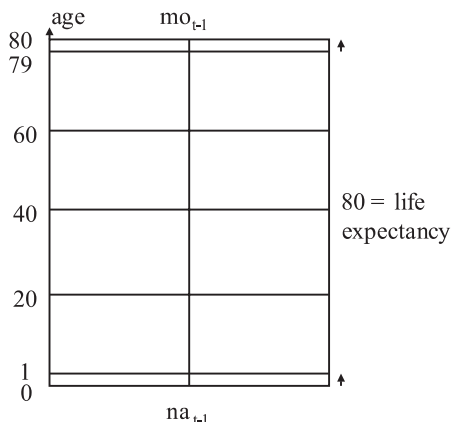
Figure 1
Life-Trees in Demography



These traditional types of life trees would complicate our analysis. Therefore, I assume that the life tree is a normal rectangle. It is an ideal static and self-reproducing system, where $na_{t-1} = mo_{t-1}$, e.g. the natality in year $t-1$ equals the mortality in year $t-1$. Both age structure of population and life expectancy are assumed to be unchanged.

A population policy (P_t) is specified as the absolute level of "pro-population" transfers from the state, e.g. public loans, state support to housing, maternity relief and other transfers. If a population policy exists, $P_t = 1$. If a population policy doesn't exist, $P_t = 0$. The effect of population policy to fertility can be described as $\alpha \cdot P_t$. If $\alpha > 0$, it is a pro-natalist population policy. If $\alpha < 0$, it is an anti-natalist population

Figure 2

Absolutely Stationary Tree of Life

policy. If $\alpha = 0$, the population policy doesn't influence the fertility. I propose four hypotheses of population policy:

– constant rate of the birth rate – population policy is ineffective because the birth rate doesn't react to incentives of population policy:

$$na_t = na_{t-1} = \text{const.}, \quad (1)$$

– simple adaptive model – population policy is long-term effective:

$$na_t = na_{t-1} + \alpha \cdot P_t, \quad (2)$$

– “natural-rate” hypothesis – population policy is only short-term effective, because the birth rate comes back to the “natural rate” of the birth rate:

$$na_t = na^* + \alpha \cdot P_t, \quad (3)$$

– “crowding-out” hypothesis – population policy is ineffective, because people having children sooner for the sake of the population policy wouldn't have them in the next period:

$$na_t = na^* + \alpha \cdot P_t - \Delta na_{t-1} \quad (4)$$

Table 1 summarizes implications of different population-policy hypotheses. The first serious possibility is total ineffectiveness of pro-natalist policy. In the adaptive model, the population (pro-natalist) policy is effective even in the long run, because the new birth rate doesn't come back to the initial level. The “natural-rate” hypothesis implies that long-term natality remains on the natural level. If the crowding-out hypothesis were all right, it would lead to disequilibrium in the whole system (continuous volatility of the birth rate).

Proof of implications of the crowding-out hypothesis. The crowding-out hypothesis proposes that $na_t = na^* + \alpha \cdot P_t - \Delta na_{t-1}$. The change in the birth rate in period $t-1$ is $\Delta na_{t-1} = na_{t-1} - na_{t-2} = na^* + \alpha \cdot P_{t-1} - na_{t-2}$. Let us assume that $na_{t-2} = na^*$, e.g. that there was no intervention by a population authority before last period and the birth rate was equal to the natural-rate. Then we can write $na_{t-1} = na_{t-2} + \alpha \cdot P_{t-1} = na^* + \alpha \cdot P_{t-1}$. The birth rate in period t is, according to the crowding-out hypothesis, equal to $na_t = na_{t-1} + \alpha \cdot P_t - na_{t-1} + na_{t-2}$, and because $na_t = na_{t-2} = na^*$, it follows from this that

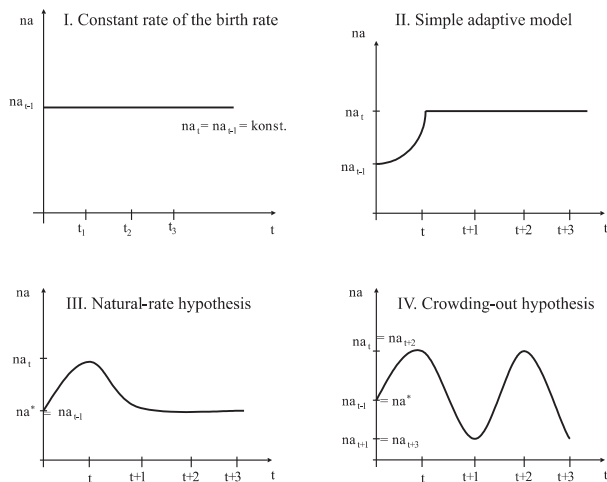
$$\begin{aligned}
 na_{t+1} &= na_{t-1} + \alpha \cdot P_{t+1} - \alpha \cdot P_t = na^* + \alpha \cdot P_{t-1} - \alpha \cdot P_t = na^* - \alpha \cdot P_t \\
 na_{t+2} &= na_t + \alpha \cdot P_{t+2} - \alpha \cdot P_{t+1} = na^* + \alpha \cdot P_t \\
 na_{t+3} &= na_{t+1} + \alpha \cdot P_{t+3} - \alpha \cdot P_{t+2} = na^* - \alpha \cdot P_t
 \end{aligned}$$

which was to be proved.

Table 1
Implications of Population-Policy Hypotheses

		1. Constant rate of the birth rate	2. Simple adaptive model	3. "Natural-rate" hypothesis	4. "Crowding-out" hypothesis
Time	ΔP	$na_t = na_{t-1} = \text{const.}$	$na_t = na_{t-1} + \alpha \cdot P_t$	$na_t = na^* + \alpha \cdot P_t$	$na_t = na^* + \alpha \cdot P_t - \Delta na_{t-1}$
$t-1$	0	na_{t-1}	na_{t-1}	$na_{t-1} = na^*$	$na_{t-1} = na^*$
t	+	na_t	$na_t = na_{t-1} + \alpha \cdot P_t$	$na_t = na^* + \alpha \cdot P_t$	$na^* + \alpha \cdot P_t$
$t+1$	0	na_t	$na_{t+1} = na_t + \alpha \cdot P_t$	na^*	$na^* - \alpha \cdot P_t$
$t+2$	0	na_t	$na_{t+1} + \alpha \cdot P_t$	na^*	$na^* + \alpha \cdot P_t$
$t+3$	0	na_t	$na_{t+1} + \alpha \cdot P_t$	na^*	$na^* - \alpha \cdot P_t$

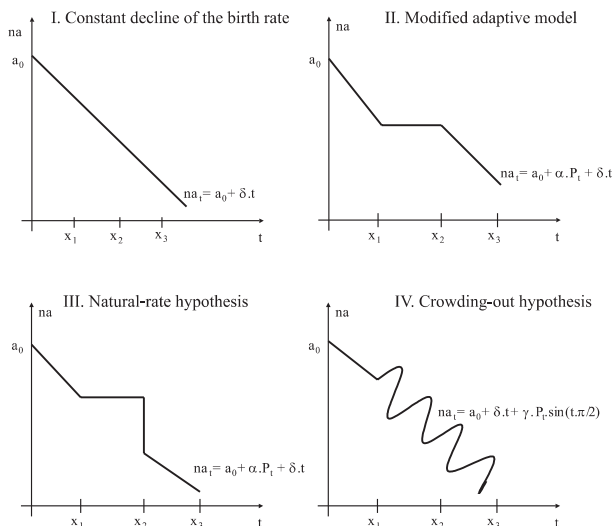
Figure 3
Population-Policy Hypotheses (Stationary Model)



4. 2 Dynamic Model

To make the model of population policy's effectiveness more realistic and testable, I assume that the birth rate in time t equals the sum of autonomous magnitude a_0 , an effect of population policy $\alpha \cdot P_t$ and a factor of continuous decline in birth rate $\delta \cdot t$, where $\delta < 0$. The continuous decline in the birth rate can be interpreted as a cultural trend or microeconomic phenomenon of increasing opportunity costs of children.

Figure 4
Population-Policy Hypotheses (Dynamic Model)



We divide time into three intervals, which are defined by points 0, x₁, x₂ and x₃. In the interval (0, x₁) there is no population policy and the birth rate is given by its “spontaneous” development. In the interval (x₁, x₂), a population policy is applied. In interval (x₂, x₃) the pro-natalist policy is not applied: it means that either it doesn’t affect the birth rate (natural-rate hypothesis) or it affects the birth rate, though it can’t reverse the trend of continuous decline in the birth rate (modified adaptive model).

Hypothesis of continuous decline in the birth rate:

$$na_t = a_0 + \delta \cdot t \quad (5)$$

A population policy is, according equation (5) is ineffective, the birth rate decreases. Although a population policy can be introduced, $\alpha = 0$ means that an expression $\alpha \cdot P_t$ is equal to zero.

Modified adaptive model:

$$na_t = a_0 + \alpha \cdot P_t + \delta \cdot t \quad (6)$$

A population policy in equation (6) is effective, because it halts the permanent trend of decreasing birth rate. After a certain time, it continues to decrease, from a higher autonomous level than before population intervention. $P_t = 1$ is for period, when the population policy is efficient, e. g. $t \in (x_1, x_3)$, $P_t = 0$ is for period, when pro-natalist policy is not efficient, e. g. $t \in (0, x_1)$. The pro-natalist policy’s effect in the interval (x₂, x₃) has the same significance as an autonomous increase a₀ by an expression $\alpha \cdot P_t$.

„Natural-rate“ hypothesis:

$$na_t = a^*_0 + \alpha \cdot P_t + \delta \cdot t \quad (7)$$

A population policy in equation (7) is effective only in the short run, the birth rate is coming back to the “natural-rate” (it is not “deviated” as in the modified adaptive model). After the end of intermediate effect of population policy, the birth rate is coming back to the descendent path. It is no autonomous increasing for the period

(x_2, x_3) , in contrast to the adaptive model. $P_t = 1$ is for the period, when the pro-natalist policy exists, e. g. $t \in (x_1, x_2)$, $P_t = 0$ is for the period, when a pro-natalist policy doesn't exist, e. g. $t \in (0, x_1)$ and (x_2, x_3) .

Crowding-out hypothesis:

$$na_t = a_0 + \delta \cdot t + \gamma \cdot P_t \cdot \sin(t \cdot \pi / 2) \quad (8)$$

A pro-natalist policy is according to equation (8) ineffective, because people deciding to have children sooner won't have them later. In the area of decreasing birth rate, it is possible to express the permanent volatility of the birth rate as a sinusoid with the amplitude equal to the effect of pro-natalist policy in period t and delay $t \cdot \pi / 2$. The expression $P_t = 0$ is operative for period $(0, x_1)$, $P_t = 1$ is operative for period (x_1, x_3) .

5. Data and Empirical Results

Nine countries have been examined – Germany, Italy, France, Sweden since the World War I, and Bulgaria, Czechoslovakia, Hungary, East Germany and Romania under communism and one decade after its fall. The five-year averages in the total fertility rates of women in reproduction age (15-44 years) have been used. The birth rate has not been used because of deforming estimations of pro-natalist policies' effects (age cohorts are differently strong). The five-years averages have been used to eliminate random deviations in the birth rate in individual years.

The dependent variables are total fertility rates in reproduction age. Independent variables are a) the time measured by five years, b) parameter P_t according to the adaptive model, c) parameter P_t according to natural-rate hypothesis and d) parameter P_t according to crowding-out hypothesis. There have been tested four hypo-

Table 2
Total Fertility Rates

	Germany	Italy	France	Sweden
1901 – 1905	4.77	4.43	2.79	3.91
1906 – 1910	4.34	4.47	2.60	3.76
1911 – 1915	3.52	4.28	2.25	3.31
1916 – 1920	2.26	3.08	1.65	2.94
1921 – 1925	2.62	3.90	2.42	2.58
1926 – 1930	2.10	3.46	2.30	2.08
1931 – 1935	1.84	3.06	2.16	1.77
1936 – 1940	2.24	3.00	2.07	1.82
1941 – 1945	1.90	2.56	2.11	2.35
1946 – 1950	2.05	2.77	2.98	2.45
1951 – 1955	2.10	2.30	2.72	2.23
1956 – 1960	2.33	2.32	2.70	2.24

Source: Chesnais, 1992.

theses: the hypothesis of permanent decline in fertility (I); modified adaptive model (II); the natural-rate hypothesis (III) and the crowding-out hypothesis (IV).

Table 3
Total Fertility Rates – Communist Countries

	Bulgaria	Czechoslovakia (CR)	Hungary	Romania	East Germany
1951 – 1955	2.41	2.91	3.06	2.71	2.41
1956 – 1960	2.28	2.59	2.59	2.24	2.29
1961 – 1965	2.19	2.42	2.02	1.84	2.46
1966 – 1970	2.16	2.09	3.05	1.99	2.29
1971 – 1975	2.17	2.34	2.60	2.09	1.71
1976 – 1980	2.16	2.33	2.52	2.07	1.85
1981 – 1985	2.00	2.08	2.19	1.79	1.80
1986 – 1990	1.92	1.92	2.28	1.82	1.43
1991 – 1995	1.48	1.64	1.50	1.73	1.43
1996 – 2000	1.14	1.18	1.32	1.37	1.33

Source: World Population Prospects, 2001.

Table 4
Population Policies

Country	Period	Pro-natalist intervention
Germany	1901 – 1945	1936 – 1940
Italy	1901 – 1945	1921 – 1925
France	1901 – 1940	1921 – 1925
Sweden	1911 – 1960	1941 – 1945
Bulgaria	1951 – 2000	1971 – 1975
Czechoslovakia	1951 – 2000	1971 – 1975
Hungary	1951 – 2000	1971 – 1975
East Germany	1951 – 2000	1976 – 1980
Romania	1951 – 2000	1966 – 1970

Statistical results have arisen in most cases on 99% confidence level. Therefore, a choice between hypotheses has been made by the dependent variable variation (the least-square method), or by other criteria. Generally I have preferred the hypothesis of permanent decline in fertility (I), because it has the smallest number of parameters. Other hypotheses have been accepted, if their determination index is significantly higher.

Empirical results are summarized in the Table 5. The fact that most hypotheses give statistically significant results follows from the independent variable "time". Regression coefficients in this variable are always negative, which confirms the declining trend in fertility. Regression coefficients in other variables are positive and more or less significant.

Table 5
Regression Coefficients

Country	Winning hypothesis	Determination index (%)	Time	Parameter P_t (adaptive model)	Parameter P_t (natural-rate hypothesis)	Parameter P_t (crowding-out hypothesis)
Germany	IV.	88.25	-0.50592 (-7.14)	x	x	5.55915* (2.92)
Italy	IV.	84.54	-0.2325 (-5.41)	x	x	x
France	IV.	86.25	-0.34022 (-6.96)	x	x	7.62396 (5.97)
Sweden	IV.	83.76	-0.29426 (-6.55)	x	x	6.95813 (6.19)
Bulgaria	II.	84.60	-0.18022 (-5.56)	0.45278* (2.38)	x	x
Czechoslovakia	II.	96.13	-0.23689 (-10.25)	0.59694 (4.41)	x	x
Hungary	I.	60.32	-0.14939 (-3.48)	x	x	x
East Germany	I.	88.36	-0.13467 (-7.79)	x	x	x
Romania	IV.	80.45	-0.29738 (-3.67)	x	x	5.76631* (2.48)

Note: Determination index means a per cent of variability of fertility that the model explains (R -Squared adjusted). T -statistics are introduced in parentheses. Symbol x means hypotheses which have not been preferred. Regressions are on 99% confidence level, * means 95% confidence level.

Hypotheses for individual countries are in the Table 6 related to success in explaining the dependent variable. They receive values A (the most successful), B, C to D (the least successful). The Table 7 summarizes the number of successful hypotheses.

The most strongest results in explaining the effects of pro-natalist policies has the crowding-out hypothesis, which Germany, France, Sweden before the World War II and Romania from communist countries confirm. The influence of parameters in the crowding-out hypothesis in France and Sweden is significant on 99% confidence level. In Germany the crowding-out hypothesis competes with the modified adaptive model, it brings, however, smaller residuals than the adaptive model. The crowding-out hypothesis could be accepted also in Italy, where P -value is less than 0.1. Since the determination index in the crowding-out hypothesis is not significantly higher than in the hypothesis of permanent decline in fertility, we have preferred the hypothesis I.

Table 6

Success of Hypotheses for Individual Countries

Hyp.	Germany	Italy	France	Sweden	Bulgaria	Czecho-slovakia	Hungary	East Germany	Romania
I.	C	A	C	C	B	C	A	A	B
II.	B	C	B	B	A	A	B	B	C
III.	D	D	D	D	D	D	C	D	D
IV.	A	B	A	A	C	B	D	C	A

Note: A – the most successful hypothesis, B – less successful hypothesis, C – little successful hypothesis, D – the least successful hypothesis.

Table 7

Success of Individual Hypotheses (summarized)

	A	B	C	D
Hypothesis I (decreasing fertility)	3	2	4	0
Hypothesis II (adaptive model)	2	5	2	0
Hypothesis III (natural-rate)	0	0	1	8
Hypothesis IV (crowding-out)	4	2	2	1

The second successful hypothesis is the modified adaptive model, which is at most satisfactory in Czechoslovakia and Bulgaria. The accomodating relation of the fertility to the new level is confirmed on 95% confidence level in Bulgaria, on 99% confidence level in Czechoslovakia. The modified adaptive model in Czechoslovakia explains even 96% variability in fertility. In Czechoslovakia, however, it is not possible to underestimate the explanatory power of the crowding-out hypothesis, because *P*-statistics in last independent variable is less than 0.5 and the model covers 94% variability in fertility. In Bulgaria, the crowding-out hypothesis doesn't give statistically significant results on 90% confidence level.

The third successful hypothesis is the hypothesis of permanent decline in fertility, which doesn't need the factor of pro-natalist policy for explaining fertility. This hypothesis has been confirmed in Italy, Hungary and East Germany. In Hungary, however, no hypothesis gives too robust results. Even the hypothesis I explains only 60 % variability in fertility and the correlation coefficient -0.77 is relatively strong, but smaller than in other countries, where it moves around -0.9. The correlation coefficient in East Germany is in simple regression -0.94 and the model explains 88 % of variability in fertility, which is essentially better result than any of competing hypotheses has.

The natural-rate hypothesis, according to which fertility (or the birth rate) is coming back to the natural level, has not been confirmed in any country. Its results were not better even if the effect of pro-natalist policy was enlarged from the initial period, when a population intervention occurred, to the following period. Other enlarging of the pro-natalist policy effect has not been made, because the outcome of such a model would be similar (or identical) to adaptive model.

Summing up: the best results for the estimation of the effect of pro-natalist policies arise from the crowding-out hypothesis (four countries), further the permanent decline in fertility (three countries) and the modified adaptive model (two countries). Only in two cases out of nine (Czechoslovakia and Bulgaria), the pro-natalist policy seems to be effective, at least in the sense that it halted the declining trend in fertility in the short run. The trend, however, after some time was continuing. In seven cases of nine, the pro-natalist policy has shown to be completely ineffective. Either it had no effect on fertility (East Germany, Hungary, Italy), or had an effect, but it crowded out the children in following periods (Germany, Sweden, France and Romania).

6. Conclusion

A pro-natalist policy has been used from time to time, especially in authoritative and totalitarian regimes, but also in some democratic countries. Better position for implementing population policies have undemocratic regimes, because of having means of power for controlling the whole population. In democratic countries, pro-natalist policies are disturbed by system of checks and balances, which hinders making a systematic population policy.

The pro-natalist policies don't seem to be effective, because it is not firm. Or it is firm, but its consequence is volatility of reproduction cycles rather than permanent halting of decreasing fertility. Empirical results show that four of nine examined countries (Sweden, Germany, France, Romania) speak in side of the crowding-out hypothesis, three ones for permanent decline in fertility (Italy, Hungary and East Germany) and two ones for adaptive model (Czechoslovakia, Bulgaria). No country has confirmed the natural-rate hypothesis.

The pro-natalist policy means that either the government must force people to have more children than they want to have, or must increase the wishes of people to have children, e.g. by decreasing the costs on children. The first method is in a democratic country problematic. The second method is less problematic, but it may not be effective. The pro-natalist policy destabilizes a reproduction cycle. The declining fertility is moreover halted in the short run and it is not sure, whether the costs of such an operation are not higher than its benefits.

National governments and international donors were often ambiguous, when formulating population policies. The fact that sometimes a family policy is introduced to limit fertility and sometimes to increase it shed serious doubts on population programs. The pro-natalist policy is an example of a bad intervention, which is expensive and doesn't have the intended effects. The pro-natalist policy is not a good instrument for a change in the long-term economic and demographic trends.

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