



Munich Personal RePEc Archive

Declining Fertility in Europe – An Economic Appraisal

Honekamp, Ivonne

University of Bamberg, Chair in Empirical Microeconomics

March 2008

Online at <https://mpra.ub.uni-muenchen.de/15848/>
MPRA Paper No. 15848, posted 22 Jun 2009 01:18 UTC

Declining Fertility in Europe

– An Economic Appraisal –

Ivonne Honekamp

March 2008

Contact information

Ivonne Honekamp
University of Bamberg
Chair in Empirical Microeconomics
Feldkirchenstraße 21
96045 Bamberg
Germany
Tel.: +49 (0)951-863-2603
Fax: +49 (0)951-863-2599

Affiliations

Ivonne Honekamp is a research associate at University of Bamberg in Germany. She works for the chair in empirical microeconomics. Her current research subjects are family policy, household saving and pensions. She holds a Master in Economics and Social Sciences of Utrecht School of Economics in the Netherlands and a German University Diploma in Economics of Bonn University.

Abstract

Demographic change can be observed throughout Europe. A bulk of literature has focused on ways to mitigate the consequences of ageing by reforming existing institutions of the welfare state. Another way to alleviate the long-run consequences of an ageing population is to reverse the demographic development by increasing the fertility rate. This is the subject this paper is about. It offers a short review about existing approaches analysing the factors which influence individual's decision to have children. Firstly, an outline of the potential effects of the increasing dependency ratio on the welfare state and economic growth is provided. Special attention is paid to the development in Germany which is one of the countries most severely affected by low fertility. Furthermore, different theoretical approaches are described which attempt to explain why couples choose to have fewer children today. Lastly empirical work is considered which shows how policy changes affect fertility and that those findings are not always in line with economic theory.

Table of Contents

1	Introduction	1
2	Social Insurance Systems under Pressure	2
3	Fertility and Economic Growth.....	3
4	Economic Theories of Fertility	5
5	Empirical Evidence	6
6	Conclusion.....	7
7	References	9

1 Introduction

Many European countries are struggling to finance their welfare states. Contribution or tax financed insurance schemes presuppose that a sufficient fraction of the population participates in these schemes. If this were not the case, expenditures for pensions, health-care or nursing care would exceed revenues and the insurance provider, in many countries the government, would run into serious financial problems. In developed countries it is, however, not a secret that the ratio between the beneficiaries and the contributors is changing. In the European Union¹ the old age dependency ratio² is predicted to increase from 22.1 in 1995 to 51 in 2045 (Eurostat 2006). This implies that in 2045 two people of working age will have to finance the pension for one elderly. For the year 2020 it is diagnosed for Germany that together with Italy it will be the country with the lowest proportion of young people within the EU (Eurostat 2006). Figure 1 shows a slightly more favourable development of the dependency ratio in France and the Nordic countries Sweden and Denmark.

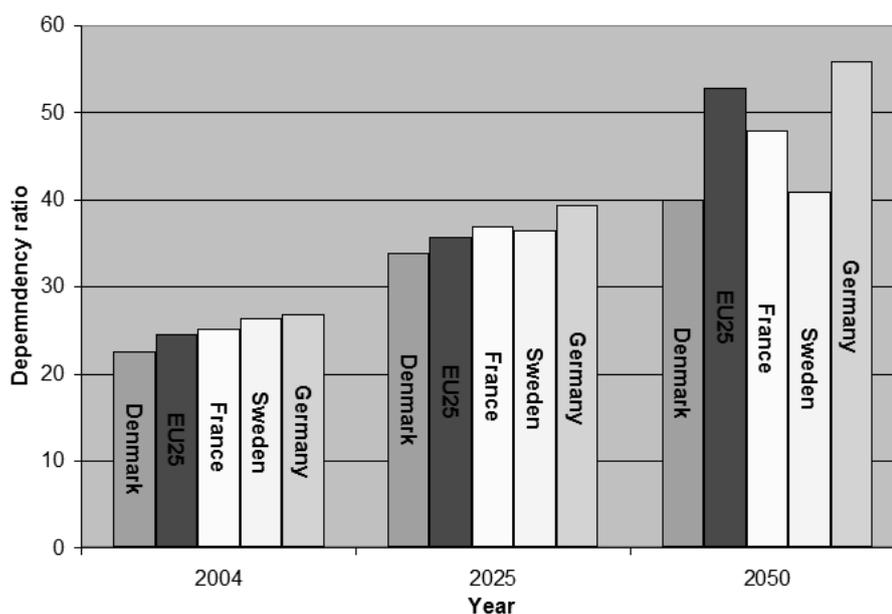


Figure 1: Change in the dependency ratio

To mitigate deficits in the government budget politicians, for example, reform their health insurance by introducing co-payments or the pay-as-you-go system by sup-

¹ 25 member states.

² The old age dependency ratio is the ratio between the total number of elderly persons of an age when they are generally economically inactive (aged 65 and over) and the number of persons of working age (from 15 to 64) (definition Eurostat 2006).

plementing it through funded private insurance. In the following special attention will be given to the situation in Germany which is one of the countries most severely affected by the ageing problem.

2 Social Insurance Systems under Pressure

Even politicians have realised that Germany's social insurance system in its present form is unsustainable since it highly relies on contributions from a shrinking working population. The mandatory pay-as-you-go financed pension system is already severely affected (Honekamp 2007). Unfortunately, there is no easy way to decrease its size when it becomes unsustainable. A fundamental change towards a funded scheme would entail a double burden for at least one generation. It would not be justifiable to ask the working population to finance the pensions of the retired and additionally save for their own retirement. A pareto improvement by switching to a funded scheme is unlikely even if one considers a long transition period and the higher return in the capital market as compared to the return of the pay-as-you-go pension. A further discussion of the financial implications due to a transition to a funded scheme has among others been provided by Breyer (1989) and Fenge (1995).

Reforming the welfare state to make it compatible with the changing age structure of the population is not an easy task for the government. People are reluctant to accept changes especially if they are accompanied by a cut back of welfare benefits. Many politicians are cautious when reforming the pension or health insurance system. They feel that they operate near the threshold at which citizens just accept changes without insurrection. As a result, it can not be expected of the German government that it will succeed with its reforms in the near future. Fighting the symptoms is indisputable an important task for governments but there are limitations to reforms. For that reason it might be advisable to concentrate on reversing the demographic development as an additional policy goal.

There are two causes of an increasing dependency ratio which can directly be derived from the calculation of the old age dependency ratio. On the one hand, people's life-expectancy continuously increased; in 1960 German males on average reached an age of 66.9 and today they can expect to live 75.96 years (Statistisches Bundesamt 2006, Indexmundi 2007a). Medical advancements, less demanding manual work and a healthier life make it possible to grow older. There is nothing wrong with this de-

velopment and neither economists nor politicians should bother decreasing life-expectancy again. On the other hand fertility rates declined throughout the whole of Europe. Nowadays, it does not even reach the replacement rate of 2.1 children per woman which is needed to keep the population constant. Figure 3 below shows that France, Denmark and Sweden which face a lower dependency ratio than Germany also have a considerably higher fertility rate which is 1.9, 1.8, 1.7 and 1.3 in Germany respectively. Since the number of people of working age directly enters the calculation of the dependency ratio, it is obvious that a higher fertility rate will constitute a lower dependency ratio in the long run. The key to decrease population ageing is the fertility rate.

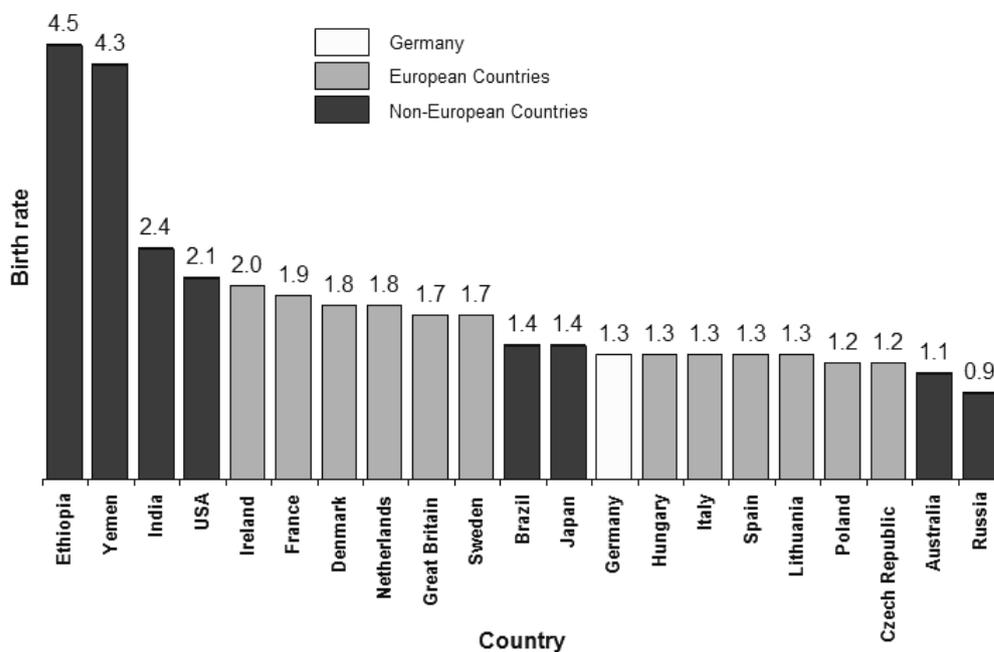


Figure 2: International comparison of fertility rates 2003³

3 Fertility and Economic Growth

The fertility rate of the United States is higher than the one in the European Union (Figure 2). According to Sinn (2005) this holds the risk that Europe will never manage to catch up with the innovative power of the United States. He argues that scientists of all disciplines attain their maximum performance at age 35 on average. As this age group is shrinking so also does the innovative power, the establishment of new business and hence dynamic growth. However, when identifying the long-run consequences of low fertility, researchers are discordant. While Romer (1986, 1990)

³ FaFo 2005.

supports the argumentation of Sinn, Dalgaard & Kreiner (2001) come to a different conclusion. Allowing for endogenous skill formation they find that it is not the quantity of citizens but solely the skill level of the average citizen that matters for the long-run level of per capita income. Cutler et al. (1990) find some evidence in a cross national analysis that nations with slower labour force growth experience more rapid productivity growth. Meijdam and Verbon (1997) argue that a decreasing number of children require a lower capital stock in order to keep per capita production at its former level (capital-thickening effect). This could lead to higher consumption possibilities for young and old. On the other hand, ageing also implies that total output per worker has to be shared with a larger number of pensioners (Dependency-ratio effect). In the long run they detect that the latter effect dominates the former thus individual utility decreases as the population is ageing.

The discussion above shows that the economic consequences of ageing are not always considered negative. Nevertheless, when analysing the effects on social security programs it is not possible to come up with an example in which ageing does not cause problems. When Konrad Adenauer reformed the German pension system in 1957 towards a pay-as-you-go system with pensions adjusted for productivity growth he assumed that people would always have children. This assumption, however, turned out to be fatal leading to a large financial deficit in the pension system today. Figure 3 below shows that already in 1970 Germany's fertility rate decreased below the replacement rate of 2.1 which is needed to keep the population constant.

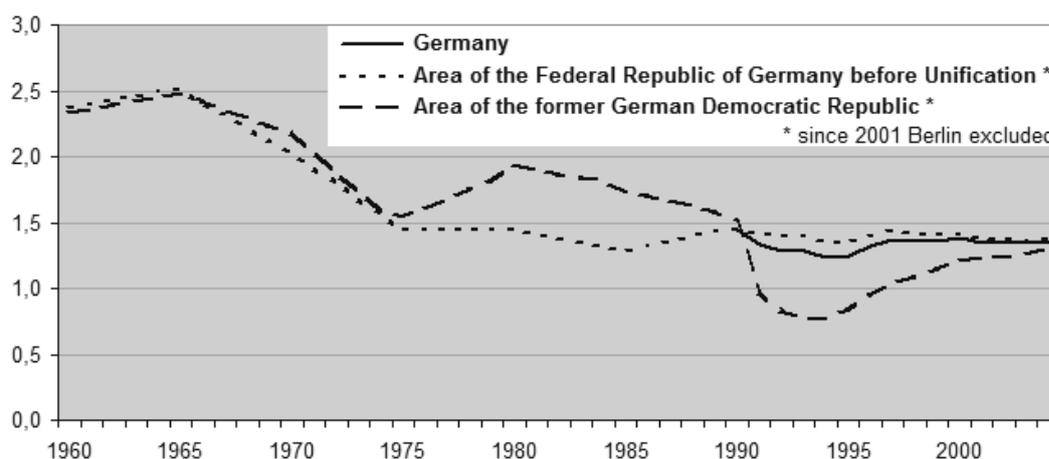


Figure 3: Fertility rates⁴ in Germany 1960-2004⁵

⁴ Definition Fertility rate: Sum of children to which a 15 years old woman would give birth to during her live if she would behave like all the observed women aged 15-49 during the year under report.

4 Economic Theories of Fertility

In order to counteract a low fertility rate it is important to develop an understanding of the process behind the child-bearing decisions. The fertility rates in the area of the Federal Republic of Germany (FRG) and the German Democratic Republic (GDR) kept track until 1975 then they diverged and approached each other again around the year 2000. The sudden increase of the fertility in the GDR has been devoted to policy changes of the then government, the decrease after unification on the other hand to the adjustment process. This incident has been outlined in a study by Lechner (1997). Nowadays the number of children is largely a matter of choice. In western countries couples decide to have children on the grounds of economic constraints and personal satisfaction which they derive from an own child. The question to be answered remains why people today decide to have fewer children than a few decades ago. Since child bearing is a choice which parents make, fertility can be treated as an endogenous variable and suggests itself of being analysed economically. The first economic models which attempted to provide an answer to this question date back to the late 1950's and early 1960's. The first contributors to this theory were Leibenstein (1957) and Becker (1960) who developed a micro-economic model based on consumer demand theory and endogenous fertility. Most economic models constitute a household utility maximisation problem.⁶ Individuals maximise their utility which depends on the cost and benefits of children. A declining fertility rate has been explained by increasing costs and declining benefits of raising children. Folbre (1994) argues that children increasingly become a public good. She claims that by providing social insurance based on participation in paid employment without explicitly valuing time effort or money devoted to children, the state literally transfers resources from parents to non-parents. Hence the benefits which families derive from their children are more on moral or cultural ground than economic rewards. Moreover the cost of children increased with more women in paid employment not willing to sacrifice their lifestyle or career for a child.

After the literature that discussed the demand for children, contributions dealing with the socially optimal fertility rate followed.⁷ They show that individual fertility deci-

⁵ DESTATIS 2006.

⁶ e.g. Becker & Barrow 1988, Becker & Lewis 1973, Cigno 1991.

⁷ to mention a few: Nerlove et al. (1985) Razin & Sadka (1995) Groezen et al. (2003), Cigno et al. (2004).

sions in the majority of cases do not lead to a social optimum. Authors argue that it is necessary to subsidise families to equalise the private and the social benefit of having children; otherwise the social benefits would exceed private benefits. A survey by the Allensbach Institut (2004) reveals that 47% of respondents feel that a child would be a financial burden. In fact couples with two children face a five percentage point and couples with three children a twenty-two percentage point higher risk of poverty than couples without children (Bundeszentrale 2004). Children entail positive externalities for society which are not fully internalised by parents. In fact, the task of government policy should be to correct for this externality to restore a social optimal family size.

Germany has a huge catalogue consisting of 145 different measures to support families which amount to 184 billion € (German Federal Ministry for family, elderly, women and youth 2006). With this amount of expenditures Germany spends more on families than the EU average. Even France spends less than Germany but experiences with 1.84 children per women in 2006 a higher fertility rate than Germany with 1.39 (Robert Bosch Stiftung 2006; Indexmundi 2007b). Economic theory suggests that a government subsidising families through child benefits or other allowances reduces the costs of having children and hence should observe an increase in its fertility rate.

5 Empirical Evidence

Traditional neoclassical models of fertility have repeatedly been criticised for the assumption that individuals have full information on the costs and benefits of various alternatives and that having a child is the result of an economically rational decision (Gauthier 2001). In recent years economists started to analyse the effects of policy changes on fertility empirically. Multivariate analyses on the effects of policies on fertility are still not very numerous. A first group of multivariate studies concentrates on country panel data. Using this kind of aggregate country data does not allow investigating possible timing effects of family benefits on various sub-groups of the population (Gauthier & Hatzius 1997). It therefore must be assumed that for example the utility of low skilled women and women with a university degree is equally affected by an increase of child benefits. This assumption is likely to be faulty because women earning a high salary will not realize a huge utility gain from an increase of child benefits of say 100 Euros as compared to women with a low earning power. Other studies use individual panel data which often provide a large number of obser-

vations. This makes it possible to address possible timing effects and to test whether family policy has a different effect on women with a differential occupational position.

Gauthier (2001) acknowledges that policy changes often led people to have children earlier in life but not to have more children. After the German reunification in 1990 Lechner (1997) found evidence that East German couples reacted to the German institutions and family policy by postponing their family formation but not necessarily to have fewer children. On the basis of individual data taken from the German Socio Economic Panel, Hank & Kreyenfeld (2003) find no evidence that the availability of public child-care facilities has an influence on child-bearing decisions. For the UK Ermisch (1988) concludes that even a doubling of child allowances would only moderately increase family size. Studies using aggregate data (eg. Blanchet and Ekert-Jaffé 1994, Gautier & Hatzius 1997, Whittington 1990) find the effect of an increase in family allowances, especially cash benefits or personal tax exemptions, to be positive and significant. The coefficients are often very small, with an increase of average benefits by 25 per cent leading to an increase of 0.07 children per women (Gautier & Hatzius 1997).

6 Conclusion

Europe's society is changing; families become smaller and many couples decide not to have any children at all. The resulting high dependency ratio makes it impossible to sustain existing welfare states. In 2020 it is diagnosed for Germany that together with Italy it will be the country with the lowest proportion of young people within the EU (Eurostat 2006). This alarming forecast has been encountered by the German government through pension and health-care reforms. It remains to be awaited how far reforms can be implemented without causing resistance in the population. This paper has focused especially on Germany which is one of the countries suffering most from the change of the age structure of the population. The field of welfare reforms, however, has been left behind and instead the work dealt with reversing the demographic development.

Not all European countries share the same fate with Germany that the dependency ratio will rise above 50% until 2050. France, Denmark and Sweden for example are with a fertility rate around 1.8 in a more favourable position than Germany with a

fertility rate of 1.3 children. These numbers enter the calculation of the dependency ratio and imply that France and the Nordic countries have a greater group of people between whom the costs of retirement and health-care can be shared. Nevertheless, no European country can keep pace with the United States which experiences a fertility rate of 2.1. According to Sinn (2005), this is not only a challenge for the welfare state but comprises also the risk that Europe's innovative power will never catch up with America.

Nowadays the decision to have children is largely a matter of choice, this led researchers to model fertility in economic terms. Thus before analysing the effects of policy changes on fertility, it is necessary to know which aspects individuals take into account when deciding to have children. Decreasing the costs of children through for example financial incentives or the provision of public day care should according to economic theory have a positive effect on family size. Empirical evidence only partly supports this theory because the coefficients on family benefits or public day-care are often very small or insignificant. The existing literature shows that the decision to have children is dependent on numerous factors; many of them cannot easily be accounted for in models. The importance of children for individual happiness seems to have changed throughout time and between countries. When deciding on the appropriate family policy each individual country has to take into account the preferences of its inhabitants as well as the existing institutions and family support which should be evaluated in terms of their goals and effectiveness. For that reason Germany set up a competence centre for family related benefits composed of social, financial and economic experts to develop a concept for a new family policy. Family Minister Ursula von der Leyen announced that first results will be available in the beginning of 2008.

7 References

- Allensbach Institut für Demoskopie, 2004. Einflußfaktoren auf die Geburtenrate. Ergebnisse einer Repräsentativbefragung der 18- bis 44jährigen Bevölkerung. [online]. Available from: <http://www.gesis.org/Information/SowiNet/sowiPlus/Gesellschaft/Materialien/Allensbach.pdf> [cited 11. Jun. 2007].
- Becker, G. 1960. An economic analysis of fertility. In Demographic and economic change in developed countries. *Univertities-National Bureau of Economic Research Conference Series*. 11. NBER. Pp. 209-231.
- Becker, G. 1960. An economic analysis of fertility. In Demographic and economic change in developed countries. *Univertities-National Bureau of Economic Research Conference Series*. 11. NBER. Pp. 209-231.
- Becker G.S., Barro R.J. 1988. A Reformulation of the Economic Theory of Fertility. *The Quaterly Journal of Economics*. 103 (1). Pp. 1-25.
- Blanchet, D. & Ekert-Jaffé, O. (1994). The Demograhic Impact of Family Benefits: Evidence from a Micro-Model and from Macro-Data. In: *The family, the market and the State in ageing societies*. Ermisch, J. & Ogawa, N. (eds). Oxford: Claredon Press. pp. 79-104.
- Breyer F. 1989. On the Intergenerational Pareto Efficiency of Pay-as-you-go Financed Pension Schemes. *Journal of Institutional and Theoretical Economics*. 145. pp. 643-658.
- Bundeszentrale für politische Bildung, 2004. Poverty rates for different household types. Calculations based on SOEP 2002. [online]. Available from: http://www.bpb.de/wissen/AAPZ12,0,Armutquoten_nach_ausgew%E4hlten_Haushaltstypen.html [cited 10 Jun 2007].
- Cigno A. 1991. *Economics of the Family*. Oxford: Claredon Press.
- Cigno A., et al. 2004. Hidden information problems in the design of family allowances. *Journal of Population Economics*. 17. pp. 645-655.
- Cutler D.M. et al. 1990. An Aging Society: Opportunity or Challenge? *Brookings Papers on Economics*. 1. pp. 1-73.
- Dalgaard C.J. & Kreiner C.T. 2001. Is Declining Productivity Inevitable? *Journal of Economic Growth*. 6. pp. 187-203.
- DESTATIS, 2006. Geburtenentwicklung in Deutschland im langfristigen Vergleich. Press release 122. [online]. Available from http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Presse/pm/2006/03/PD06__122__126.psml [cited 15. Jun. 2007].
- Ermisch, J. 1988. Econometric Analysis of Birth Rate Dynamics in Britain. *The Journal of Human Resources*. 23, (4), pp. 563-576.
- Eurostat 2006. Old-age-dependency ratio %. [online] Available from: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=sdi_as&root=sdi_as/sdi_as/sdi_as1000 [cited 30. Jun. 2007].

- Fenge R. 1995. Pareto-efficiency of the Pay-as-you-go Pension System with Intragenerational Fairness. *Finanzarchiv N.F.* 52. pp. 357-363.
- Folbre N. 1994. Children as Public Goods. *The American Economic Review*. 84 (2). pp. 86-90.
- Gauthier, A.H. 2001. The Impact of Public Policies on Families and Demographic Behaviour. Paper presented at the ESF/EURESCO conference 'The second demographic transition in Europe'.
- Gauthier, A.H. & Hatzius, J. 1997. Family Benefits and Fertility: An Econometric Analysis. *Population Studies*. 51, (3). pp. 295-306.
- German Federal Ministry for family, elderly, women and youth. 2006. Kompetenzzentrum für familienbezogene Leistungen. [online]. Available from: <http://www.bmfsfj.de/Politikbereiche/familie,did=89430.html>. [cited 11Jun. 2007].
- Groezen van B., Leers T., Meijdam L. 2003. Social security and endogenous fertility: pensions and child allowances as siamese twins. *Journal of Public Economics*. 87 pp. 233-251.
- Hank, K. & Kreyenfeld, M. 2003. A Multilevel Analysis of Child Care and Women's Fertility Decisions in Western Germany. *Journal of Marriage and Fertility*. 65, pp. 584-596.
- Honekamp, I. 2007. PAYG in an ageing society: The case of Sweden versus Germany. *Pensions: An International Journal*. 12 (3). pp. 138-153.
- Indxmundi 2007a. Country Facts. Life expectancy at birth. [online]. Available from: <http://www.indexmundi.com/>, [cited 30. Jun. 2007].
- Indxmundi 2007b. Country Facts. Total fertility rate. [online]. Available from: <http://www.indexmundi.com/>, [cited 11. Jun. 2007].
- Lechner, M. 1997. Eine empirische Analyse der Geburtenentwicklung in den neuen Bundesländern. Beiträge zur angewandten Wirtschaftsforschung. Institut für Volkswirtschaftslehre und Statistik. Universität Mannheim.
- Leibenstein H. 1957. *Economic Backwardness and Economic Growth*. New York: Wiley.
- Meijdam L. & Verbon H.A.A. 1997. Aging and Public Pensions in an Overlapping-Generations Model. *Oxford Economic Papers*. New Series. 49 (1). Pp. 29-42.
- Nerlove, M. et al. 1985. Populations Size: Individual Choice and Social Optima. *Quarterly Journal of Economics*, 1985.
- Razin, A. and Sadka, E. 1995. *Population Economics*. London: MIT Press.
- Robert Bosch Stiftung, 2006. Studie: Unternehmen Familie. Roland Berger Strategy Consultants. [online]. Available from: http://www.bosch-stiftung.de/content/language1/downloads/BuG_Familie_Studie_Unternehmen_Familie_Studie.pdf [cited 11. Jun. 2007].
- Romer, P. 1986. Increasing Returns and Long-run Growth. *Journal of Political Economy*. 94 (5), pp. 1002-1037.

- Romer, P. 1990. Endogenous Technical Change. *Journal of Political Economy*. 98. pp. 71-102.
- Sinn, H.W. 2005. Europe's Demographic Deficit – A Plea for a Child Pension System. *De Economist*, 153, pp. 1-45.
- Statistisches Bundesamt, 2006. Bevölkerungsstatistik.
- Whittington, L.A. et al. 1990. Fertility and the Personal Exemption: Implicit Pronatalist Policy in the United States. *The American Economic Review*. 80, (3), pp. 545-556.