Universität Potsdam

Hans-Georg Petersen

Taxes, Transfers, Economic Efficiency and Social Justice

Essays on Public Economics 1979 – 2009

Chapter 6: Social Policy, Higher Education and Environmental Economics

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Contents

Chapter 1:

Redistribution – Theory and Measurement

Chapter 2:

Shadow Economy

2.2.

Size of the Public Sector, Economic Growth and the Informal Economy - Development Trends in the Federal Republic of Germany

(The Review of Income and Wealth, New Haven/Conn., Series 28 (1982), pp 191 – 215)

2.3.

Taxes, Tax Systems and Economic Growth

(Herbert Giersch (Ed): Towards an Explanation of Economic Growth, Tübingen 1981, pp 313 – 347)

Chapter 3:

Impact of Taxation and Tax Reform

3.1.

Impact of the Tax System. Federal Republic of Germany

(Walter Block and Michael Walker (Eds): Taxation: An International Perspective, The Fraser Institute, Vancouver, B. C. 1984, pp 283 – 329)

3.2.

Marginal Tax Burden - A Case Study of Austria and the Federal Republic of Germany

Co-author Johann K. Brunner

(Empirica (Austrian Economic Papers), Stuttgart, Vol. 12 (1985), pp 209 – 226)

3.3.

Further Results on Income Tax Progression

(Zeitschrift für Wirtschafts- und Sozialwissenschaften, Berlin, 101. Jg. 1981, pp 45 – 59)

3.4.

The German Tax and Transfer System: A Problem Oriented Overview

(Hans-Georg Petersen and Patrick Gallagher (Eds): Tax and Transfer Reform in Australia and Germany. Australia Center Potsdam, Berlin 2000, pp 13 – 40)

3.5.

Globalisation, Capital Flight and Capital Income Taxation

(Tax Notes International, Vol. 33, No. 10, March 2004, pp 887 – 897)

Chapter 4:

Economics of Transformation

4.1.

Towards a Reformulation of the Role of the Tax and Social State in the Polish Transformation Process

Co-author Klaus Müller

(Marek Belka and Hans-Georg Petersen (Eds): Economic Transformation in Poland. Reforms of Institutional Settings and Macroeconomic Performance. Frankfurt, New York 1995, pp 131 – 141)

4.2.

Taxes and Transfers: Financing German Unification

Co-author Michael Hüther

(Ghanie Ghaussy and Wolf Schäfer (Eds): Economics of German Unification, London, New York 1993, pp 73 – 91)

4.3.

The Polish Success in Monetary Stabilization

Co-author Christoph Sowada

(Beihefte zu Kredit und Kapital, Heft 13, Konzepte und Erfahrungen der Geldpolitik, Berlin 1995, pp 383 – 411)

4.4.

On the Integration of Industrial and Social Policy in the Transition Process

Co-author Christoph Sowada

(Hans-Georg Petersen (Ed): Industrial and Social Policy in Transition Countries – Two Case Studies: Poland and Bulgaria. Shaker Verlag, Aachen 2000, pp 33 – 59)

4.5.

Privatisation and Ownership: The Impact on Firms in Transition – Survey Evidence from Bulgaria

Co-authors Atanas Christev and Felix FitzRoy

(Hans-Georg Petersen (Ed): Industrial and Social Policy in Transition Countries – Two Case Studies: Poland and Bulgaria. Shaker Verlag, Aachen 2000, pp 177 – 212)

Chapter 5:

Group- and Microsimulation

5.1.

Simulation Models in Tax and Transfer Policy: Introduction

Co-author Johann K. Brunner

(Johann K. Brunner and Hans-Georg Petersen (Eds): Simulation Models in Tax and Transfer Policy, Frankfurt, New York 1990, pp 11 – 18)

5.2.

Microsimulation of Alternative Tax and Transfer Systems for the Federal Republic of Germany

Co-authors Michael Hüther, Matthias Müller and Bernd Schäfer

(Johann K. Brunner and Hans-Georg Petersen (Eds): Simulation Models in Tax and Transfer Policy, Frankfurt, New York 1990, S. 539-572)

5.3.

Revenue and Distributional Effects of the Current Tax Reform Proposals in Germany – An Evaluation by Microsimulation

Co-author Christhart Bork

(Hans-Georg Petersen and Patrick Gallagher (Eds): Tax and Transfer Reform in Australia and Germany. Australia Center Potsdam, Berlin 2000, pp 219 – 235)

Chapter 6:

Social Policy, Higher Education and Environmental Economics

6.1.

World Crisis in Social Security: West Germany

Co-author Karl Heinz Jüttemeier

(Jean-Jacques Rosa (Ed): World Crisis in Social Security, Paris, San Francisco 1982, pp 181 – 205)

6.2.

Gloomy Prospects for Social Retirement Insurance - An International Phenomenon

Co-author Karl Heinz Jüttemeier

(Intereconomics, Hamburg, Vol. 18 (1983), pp 11 – 17)

6.3.

International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care. Comment on Richard M. Scheffler

(Herbert Giersch (Ed): Reforming the Welfare State, Berlin et al. 1997, pp 261 - 266)

6.4.

Systemic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond

(Case Doradcy Sp. z o.o., Forum Ochrony Zdrowia. Warsaw 2004, pp 1 – 26, in Polish Language)

6.5.

Education Return and Financing: Donated Affluence as Consequence of Tuition Free Study Programs in Germany

(Finanzwissenschaftliche Diskussionsbeiträge Nr. 55, Potsdam 2007)

6.6.

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation

(Ecohydrology & Hydrobiology, Warsaw, Vol. 1 (2001), pp 46 – 58)

Preface

This volume contains the articles and papers which predominately have been published in international journals or edited volumes in the period from 1979 to 2009. The single articles reflect the main research areas of the editor and his co-authors who were engaged at the Kiel Institute of World Economics, the Johannes-Kepler-University Linz/Austria, the Justus-Liebig-University Giessen, the University of Potsdam, and the German Institute for Economic Research (DIW Berlin). The editor would like to thank all the copy right holders for their content; if any have been inadvertently overlooked the editor will be pleased to make the necessary arrangement at the first opportunity.

The editor would also like to thank Doris Gericke and Christina Bennewitz for all their effort they have invested in the creation of this volume. As a matter of course the editor is deeply indebted to all his co-authors and collaborators and last but not least to all the foundations, which have supported the research projects by generous grants.

Potsdam, September 2010

Hans-Georg Petersen

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9

KARL HEINZ JÜTTEMEIER
HANS-GEORG PETERSEN

World Crisis in Social Security:

West Germany

The present federal system and subsystems—general, special, industrial. Increased benefits and contributions. Demographic problems. Pensions and private saving. Funding or financing. Taxes, contributions, and work disincentives. Redistribution. Solutions to labor-market problems.

West Germany has three principal sources of retirement income: the state pension system, private firms' pension plans, and individual life insurance. In the state system, a basic mandatory program covers most employees, but the program is voluntary for the self-employed. Pensions paid from the compulsory general public system amounted to about 11.2 percent of gross national product (GNP) in 1977, which compared with much smaller payments from pension plans of private firms (1.3 percent in 1977) and from private life insurance (1.6 percent). Special programs also exist for other groups, including government officials, farmers, and war victims.

The general government retirement program is financed on a pay-as-you-go basis, partly by a payroll tax usually divided equally between employers and employees, and by a transfer from general revenues—a transfer which has been declining in recent years; in 1981 it is expected to cover about 14.0 percent of total program costs. The payroll tax amounts to 18.5 percent of gross wages up to a ceiling of DM 52,800 ($22,176 U.S. at an exchange rate of DM = $0.42 U.S. as of 1 July 1981). Pensions are normally payable at age 65; but men at age 63 and women as well as unemployed men at 60 may elect early retirement with no loss of benefits, but with an earnings test which applies only to early retirement.

Individual pensions depend on contributions, on the number of pensionable years, and on the relative income position

during total working life. For several reasons, the average working life of men is greater than that of women (38 years for men versus 25 for women in 1977), and men therefore have higher pensions in relation to last earnings (replacement rate) than women (57.0 percent for men, 37.5 percent for women). Since 1957 pensions have been indexed to reflect both inflation and real income growth.

Funding problems first appeared in the mid-1960s, when expenditures began to exceed revenues. The government responded by raising the payroll tax rate from 14 percent in 1967 to 18 percent in 1973. In 1972, however, it also made the system considerably more generous. During the recession, which began in 1974, it became clear that the system was faced with a financial crisis, and in 1978 the government implemented a series of reductions in outgo. A further reduction is planned for 1983.

Looking to the future, the ratio of workers to retirees (excluding the public pensions for *Beamte*) will remain fairly constant until 1990, declining from 2.19 in 1980 to an estimated 2.11 in 1990. After that, however, following the experience in other countries, the ratio will decline significantly to 1.56 in 2010 and to an incredible 1.12 in 2030. The extent of the problem may be realized by considering that the number of employed personnel could decline by 30 percent in the period between 2000 and 2030.

These changes would cause a serious financial strain on the system, such that—under certain reasonable assumptions—payroll taxes would have to be increased from 18.5 percent to 32.0 percent in order to maintain currently legislated benefits in 2030. Reduced assumptions about economic growth would make the problem still worse.

The long-term financial outlook is aggravated by an extremely generous pension formula which links pensions to gross wages but does not tax them. Since it is possible to cumulate pension benefits from different pension sources, net benefits for individual pensioners frequently equal more than 100 percent of the last wage, after tax.

There is no conclusive evidence that the pension system has reduced saving in West Germany, whose payroll tax and saving rates are both among the highest in the world.

On employment effects, until 1972 there was no earnings test and thus no effect on employment. But provisions for early retirement enacted in that year impose a 100 percent tax on benefits above monthly wages of DM 1,320 ($554.40 U.S.) for pensioners who retire at age 63, and on benefits above DM 550 monthly earnings ($231.00 U.S.) for people who retire at 60. In the longer term, rising payroll-tax rates combined with a general rise in taxation may well prod many people either to avoid employment or to join the underground economy.

Since net pensions have been increasing faster than net wages, redistribution from workers to pensioners has become a live political issue. There are also redistributive effects within generations. Elements of the pension system tend to favor retirees with low pensions, government officials, and the self-employed, whereas certain tax regulations tend to favor the rich. Since the tax and transfer systems are not coordinated, their net redistributive impact is far from clear.

Recent official reports have suggested measures to relieve the economy of the burden imposed by the pension system. But incremental solutions will not be enough in the long term. A fundamental change is needed in the prevailing attitudes of politicians and the public so that they will no longer expect a paternalistic state to produce an endless stream of benefits.

DEVELOPMENT AND STRUCTURE OF THE CURRENT SYSTEM

In retrospect, one of the most creditable achievements of the Bismarck era was probably the introduction of a social security system which remained largely unchanged despite the economic and political disruptions of later German history. The system enjoys a unique popularity. For roughly one fifth of the

West German population, social security provides the major source of income, and this proportion will increase in the years to come.

Yet despite its success, social security is becoming more and more subject to criticism, and there is a growing awareness of future problems. The introduction in 1957 of annual pension adjustments as well as 1972 measures which greatly liberalized benefits have severely strained the retirement insurance system. With today's pension formula, dramatic demographic developments at the end of the century will enormously increase expenditures. In the current political climate, measures are often discussed which could impair the future growth potential of the West German economy and thus make future solutions even more difficult. Because social retirement insurance cannot be reformed overnight, a long-term perspective must be found which does not impose a hopeless burden on current or future working generations.

Today's social security is the outcome of nearly a century of experience, which began with the emperor's message on 17 November 1881. The next eight years brought public health insurance (1883), industrial injuries insurance (1884), and disability and retirement pension insurance (1889). In its original design, Bismarck's retirement insurance was a funded system which followed the pattern of ordinary private insurance:[1] risk sharing among individuals, with contributions paid according to the probability of the insured event. But even these early systems had redistributive features.

In 1948 superinflation and monetary reform almost completely destroyed the social insurance funds (and those of private insurance companies) and the system had to be restructured. The conversion to pay-as-you-go financing was inevitable; it became obvious that each active generation would have to provide for the inactive generations out of the current national income. In the wake of these events, the system was gradually opened to nearly all parts of German society.

Pensions at present are paid from three main sources:

(1) a compulsory general public system for employees, voluntary membership for the self-employed, and some special public systems;
(2) the pension schemes of private firms, which have grown most noticeably in recent years; and
(3) voluntary private life insurance, partly tax privileged.

The general public pension scheme is intended to be the main income source of aged persons, whereas private pensions and life insurance provide for greater security. For 1977, total benefits from the three sources amounted to about DM 134 billion (79.0 percent) from social insurance, DM 16 billion (10.0 percent) from the insurance of private firms, and DM 19 billion (11.0 percent) from private life insurance (Schmidt-Kaler 1979, p. 559). Other forms of benefits are also available to the elderly, such as welfare and housing assistance. Altogether it is estimated that total 1979 social transfer payments amounted to DM 425 billion, which is slightly more than 30.0 percent of GNP. Pensioners receive 38.4 percent of this, excluding health insurance payments (see Deutscher Bundesrat 1980).

The German public pension system includes several different subsystems:

- a general system financed mostly by contributions and divided into systems for blue-collar, white-collar, and mine workers;
- special systems for government officials[2] and war victims financed entirely from general tax revenues, and for farmers financed primarily from that source; and
- an industrial injuries scheme financed by employers' contributions.

To some extent, beneficiaries, especially widows, can cumulate benefits between and within the different subsystems.

Most revenues for the general system come from contributions raised on a pay-as-you-go basis, but supplemented by a federal subsidy that has been relatively declining in recent years

(from 23 percent of total revenues in the 1960s to about 14 percent in 1981).[3] The present contribution rate is 18.5 percent of gross wages up to a ceiling of DM 52,800 per year, in most instances shared equally between employers and employees. The ceiling is increased annually in accordance with average wage increases. By and large, individual benefits depend on contributions, providing pensions for disability, retirement, and surviving dependents. Pensioners' contributions to the public health insurance scheme are also paid from the social pension system.

In general, the retirement age is 65, but since 1972 an earlier option has been available (the "flexible retirement age" of 63 for men and 60 for women and for unemployed persons). An earnings test applies only to early retirement. Since 1957 pensions have been adjusted annually to growth of nominal income—which means pensions increase to reflect both inflation and real income growth. Pensions are determined by four factors:

(1) the relative income position during total working life of the insuree;
(2) the number of pensionable years (years for which contributions were paid as well as times for education, etc.);
(3) a general fixed increase in rate, usually of 1.5 percent, for every pensionable year (for miners, 2.0 percent); and
(4) a general basis of valuation, estimated as the mean of the average gross wages in the past three years before retirement (in 1981, e.g., DM 24,686).

Partly because of World War II and partly because of the shorter working lives of female employees, the average number of pensionable years in 1977 was thirty-eight for men and twenty-five for women—which translates into pension levels for an average relative income position of 47.0 percent and 37.5 percent, respectively, of the general basis of valuation. Because of growing insurance periods and higher female labor participation, these levels are increasing; in the long run they will exceed 60.0 percent for forty and more pensionable years.

In 1972 the benefit system was greatly liberalized, as self-employed people and spouses were allowed to join the system and to make contributions retroactively on very favorable terms for past years. In the same year the already mentioned flexible retirement age and a regulation which comes close to a minimum pension were introduced, and pensioners' contributions to social health insurance were taken over by the social pension system. Most of these changes bore the character of redistributive transfers to the new classes of beneficiaries.

Today's social security system covers nearly everyone, but the recent benefit changes will impose severe problems on the system in the future.

PAST, CURRENT, AND FUTURE FINANCIAL PROBLEMS

The growing financial stresses on the German social security system must be viewed in relation to the enormous increase in all forms of public social spending in Germany since the 1880s. Adding to existing programs is politically far easier than reducing or replacing them, so few programs are ever reexamined. The bias and momentum toward ever-increasing social spending continues unchecked. Because of this one-way road toward more and more, the ratio of total real transfers (including social insurance) to real GNP has doubled since 1950, whereas real public expenditures for goods and services in relation to real GNP, after remaining constant for a long period of time, have actually declined in recent years. Growing transfers, by themselves, are responsible for the rapid growth of the German public sector.

A major reason for the explosion of benefit payments in the retirement insurance program results from the benefit formula just discussed. In the short term, conditions were favorable. Unfortunately, the long-run impacts were far more burdensome than the short-term effects; for instance, the retroactive payments for past years brought an immediate influx of reve-

nue and thereby led to short-run improvements, but long-term obligations present a very different picture, exceeding contributions three—to sixfold.

As a result of the dynamic of this system, despite continuous economic growth at nearly full employment and an increasing number of contributors, in the mid-1960s expenditures began to exceed revenues. To meet this short-term deficit, an increase of the contribution rate from 14 percent in 1967 to 18 percent in 1973 was necessary. Serious recession exposed the limits of the system and it nearly collapsed.

The 1974-1975 recession produced a serious decline in contributions. As it became obvious that the high unemployment rates of this period were structural rather than cyclical and that liquidity reserves had been severely depleted to finance current expenditures, politicians tried to reduce expenditures shortly after the 1976 federal elections, contrary to all election promises and for the first time in postwar Germany. New and important changes came in 1978. First, automatic pension adjustments were reduced for the period from 1979 to 1981. In 1979 pensions increased only 4.5 percent instead of the 7.0 percent called for by the former benefit schedule; similar reductions were made in 1980 and 1981. Beyond that, adjustments were deferred six months. In 1981 the contribution rate was increased from 18.0 to 18.5 percent, and beginning in 1983 individual pensioners will again be required to contribute to health insurance.

These major changes and the real economic growth in 1979 combined with a decline in unemployment to improve the system's financial condition. The last estimates of expenditures and revenues show that from 1980 to 1983 liquidity reserves will increase, but this improvement will occur only if no serious recession takes place. Since recent forecasts are rather pessimistic, with negative growth expected for 1981 a new collapse seems likely.

In 1980 the so-called "pensioners' mountain" of the mid—and late 1970s will have passed (see figure 1). From 1980 to 1990 the ratio of people aged 60 and over to people aged be-

tween 15 and 60 will remain relatively constant.[4] The government argues that, if the law is not changed and no serious recessions occur, no serious problems are ahead of us. But experience shows that the number of pensions paid tends to increase faster than the number of people who reach the normal retirement age, which will put new stresses on the system. Another source of pressure has already appeared in the form of a Federal Constitutional Court judgment that the present system violates the constitutional requirement of equal rights for men and women, thus forcing the federal parliament to restructure survivors' benefits. Better provision for widows is also intended—which is important but is likely to be very expensive, no matter what the politicians say. Whatever changes are proposed, the great task will be to avoid short-sighted solutions. A good rule would be to stay away from new expenditures without making compensating reductions elsewhere.

Table 1

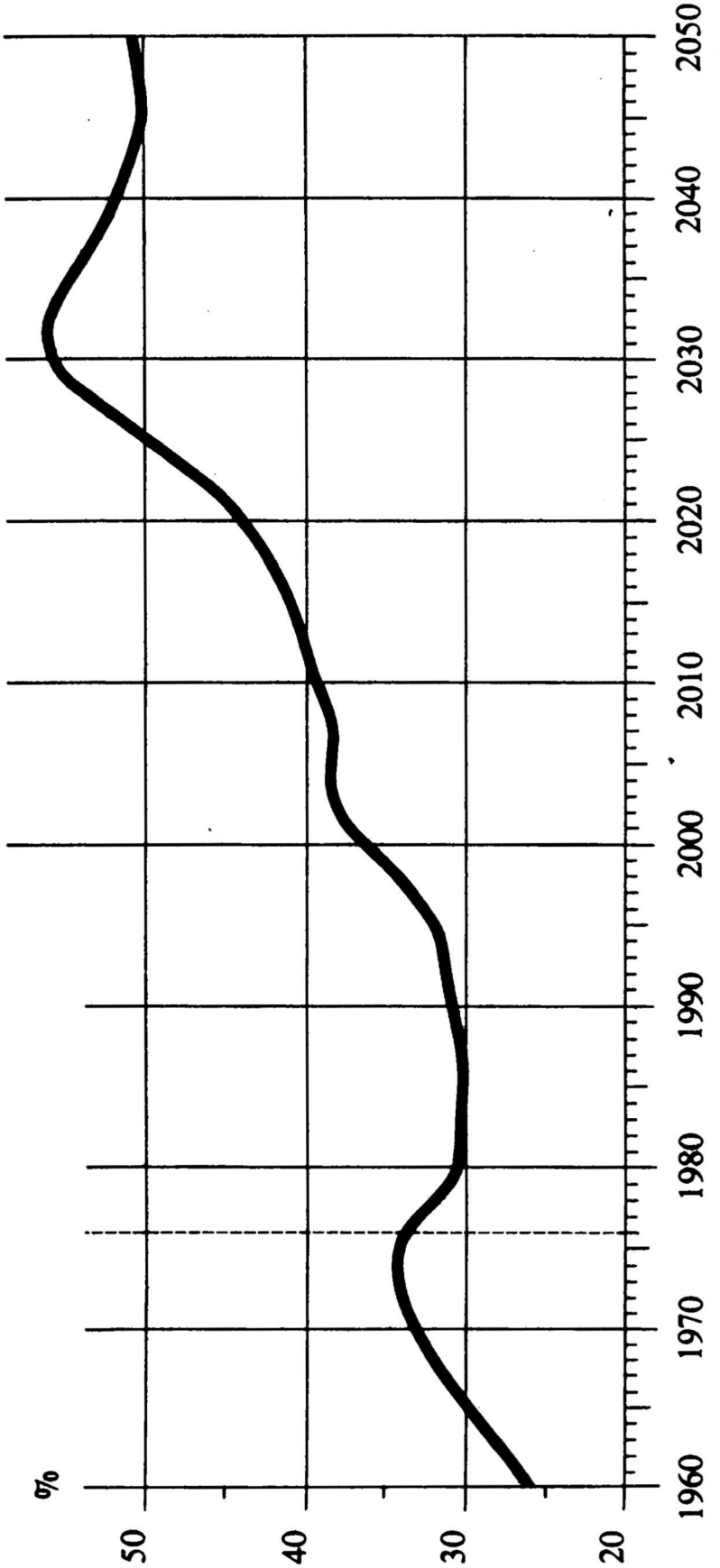
Ratio of workers to retirees[a]

Year	Workers (millions)	Retirees (millions)	Ratio of workers to retirees
1975	24.5	10.2	2.40
1980	24.7	11.3	2.19
1985	25.2	11.7	2.15
1990	25.5	12.1	2.11
1995	24.9	12.6	1.98
2000	24.1	13.2	1.83
2005	23.3	14.0	1.66
2010	22.5	14.4	1.56
2015	21.4	14.5	1.48
2020	20.0	14.6	1.37
2025	18.3	14.7	1.24
2030	16.7	14.9	1.12

Source: Petersen (1981*b*).

[a]Excluding public pensions for *Beamte*.

Figure 1
Dependency Ratio of Aged Persons in the Federal Republic of Germany
1960-2050



Source: Löwe 1978, p.105

Limiting present costs is important to prepare for dramatic demographic developments which will occur in the late 1990s. If population growth continues at the current net reproduction rate of 0.65 (a rate of 1.0 means a constant population), the population will decline from today's 61 million to 45 million in 2030, or more than 20 percent. But more important than this number is the rapidly changing age structure of the population. As figure 1 shows, Germany will be at the bottom of a new pensioners' mountain in 1990, and the year 2030 could see another peak. Between those years the ratio of workers to retirees (excluding the *Beamten* public pensions) could decline from an estimated 2.11 in 1990 to the very low level of 1.12 in 2030. The number of employed persons will decline slowly until the year 2000, and then could decline about 30 percent between 2000 and 2030. With today's pension formula, expenditures would increase enormously during that period.

There are two important defects in the German pension formula:

(1) In a pay-as-you-go system, pension levels as well as contribution rates of the working generation can be kept constant only if the relation between pensioners and contributors does not change. If, as in the past, the population continues to increase, a constant pension formula can work well; it will create no financial problems. But the West German population is already declining and will probably decline in the future, and problems in the pension system will be severe if the currently committed benefits stay unchanged.

(2) Pensions are linked to average *gross* wages. Since pensions are factually not subject to income tax[5] and it is possible to cumulate pensions from different sources, it is becoming increasingly common for total net pension payments to amount to more than 100 percent of the last *net* wage.

If we assume an average real growth of 3.5 percent in GNP up to the year 2000 and of 2.4 percent until 2030, the contribu-

tion rate will have to be increased from 18.5 percent today to 32.0 percent, presuming constant current net reproduction rate and pension levels. Lower economic growth would lead to an even higher increase. Naturally, these estimates are rather speculative. But at the moment, higher future growth rates are not very likely; there are also no signs of a substantial change in generative behavior which would be necessary to improve the future ratio of workers to retirees. It is obvious that, to secure the above presumed growth rates, a lot of technological progress and rapid structural changes would be needed, combined with increasing incentives for additional work. The problem here, as in other dimensions of social security, lies in what these rate increases will do to work incentives.

EFFECTS ON THE OVERALL ECONOMY

A great deal has been written about the allocative effects of social security on the overall economy—effects on both saving and employment. We have touched on the potentially harmful long-term employment effects of high and rising tax and contribution rates. Before we elaborate on these long-term effects, however, let us consider some principal questions and their relevance to the German case.

In particular, two hypotheses are controversially discussed: (1) negative impacts of private saving behavior because social security contributions are viewed as an alternative to saving, and (2) overall impacts that might result from the two financing principles of either reserve funding or pay-as-you-go.

An alternative to saving

People save for a variety of reasons, so it is rather difficult to distinguish between saving for retirement and for other purposes. Consequently, in measuring the effects of social security on personal saving, any number of substitution effects might be found. Nevertheless, some studies seem to prove a negative

impact of social security on private saving behavior. For Germany, an empirical test of that question is impossible, since all time series available are already influenced by a long-lasting social retirement system. But apart from this, we have some doubts that saving behavior changed when the system was introduced in 1889. Before then, the majority of people covered by the new retirement system was not able to save at all.

The question remains, however, whether saving rates would have been higher during the last century without a public retirement system. In cross-country analyses where different levels of social security are compared with the connecting saving rates, some empirical studies show a negative correlation. But Germany today, for instance, has about the highest social security contribution rates of any developed country (in 1981 roughly 34 percent of gross wages for retirement, health, and unemployment insurance), while German saving rates also are among the highest. It seems that tax and subsidy provisions, national attitudes, institutional regulations, etc., are *more* important factors in influencing saving behavior than the question of a public versus a private pension system. And since incomes from property and wealth do not affect the level of public retirement pensions at all, this is another reason why social retirement insurance does not necessarily have a negative impact on personal saving.

Reserve funding or pay-as-you-go

The second question seems to be rather unimportant for Germany, because there is, in fact, no choice. As discussed above, after World War II Germany had to switch over to pay-as-you-go, and today a contribution rate of 18.5 percent is not even high enough to meet all current expenditures.

Germany is in a phase of decreasing population and therefore a declining number of insurees, which means—reserve funding presumed—that to finance the current pensions either reserves must be used or contributions must be increased. Switching over from pay-as-you-go to reserve funding would

mean a sharp increase in contribution rates if reserve funds are to be built.[6] But a heavy impact on private saving is then likely, apart from possible disincentive effects which could impair future growth potential. Finally, in terms of real goods, each working generation pays taxes and contributions to support retired generations. (For a detailed discussion, see especially Mackenroth 1957, pp. 43-74.)

The marginal burden of taxes and contributions

Future economic growth will determine to what extent contributions will have to be increased and/or benefits reduced. On the other hand, it is often argued that accumulating a reserve fund would help to promote growth in order to overcome the current phase of relative stagnation; but the evidence on this is not encouraging. For instance, a closer look at the capital investment policies of German life insurance companies reveals a safety-first attitude, partly due to legal requirements. Private insurance systems seem to prefer a risk-averse portfolio. It is an illusion, therefore, to expect private insurance companies to provide the venture capital for rapid growth, and it would be far more questionable if public systems did it.

There are more promising opportunities to promote growth policies and to reduce public concern about social security—particularly, in the latter case, with regard to regulations affecting the labor market.

Effects of social security on employment are both short term and long term. The earnings test has an important short-term impact. Before 1972 the retirement age was 65 for both men and women and there was no earnings test; pensioners received their full pension entitlement no matter how much they earned. In 1972 options for earlier retirement were introduced, and at that time some restrictions were applied to the flexible retirement age of 63 and to early retirement at age 60. At present, monthly wages of DM 1,320 or DM 550, respectively, are allowed without loss of benefits.

Since these options for earlier retirement were offered without reducing benefits, there were strong incentives to retire

early. The only disincentive, in fact, was the earnings test, which affected many people not at all. These generous options for early retirement have reduced the labor force and have strained revenues, forcing increased contributions. When these regulations were introduced, unemployment among the elderly was a serious concern; but disincentives to employment in the long run are hurting the overall economy and are placing short-term stresses on the social security system.

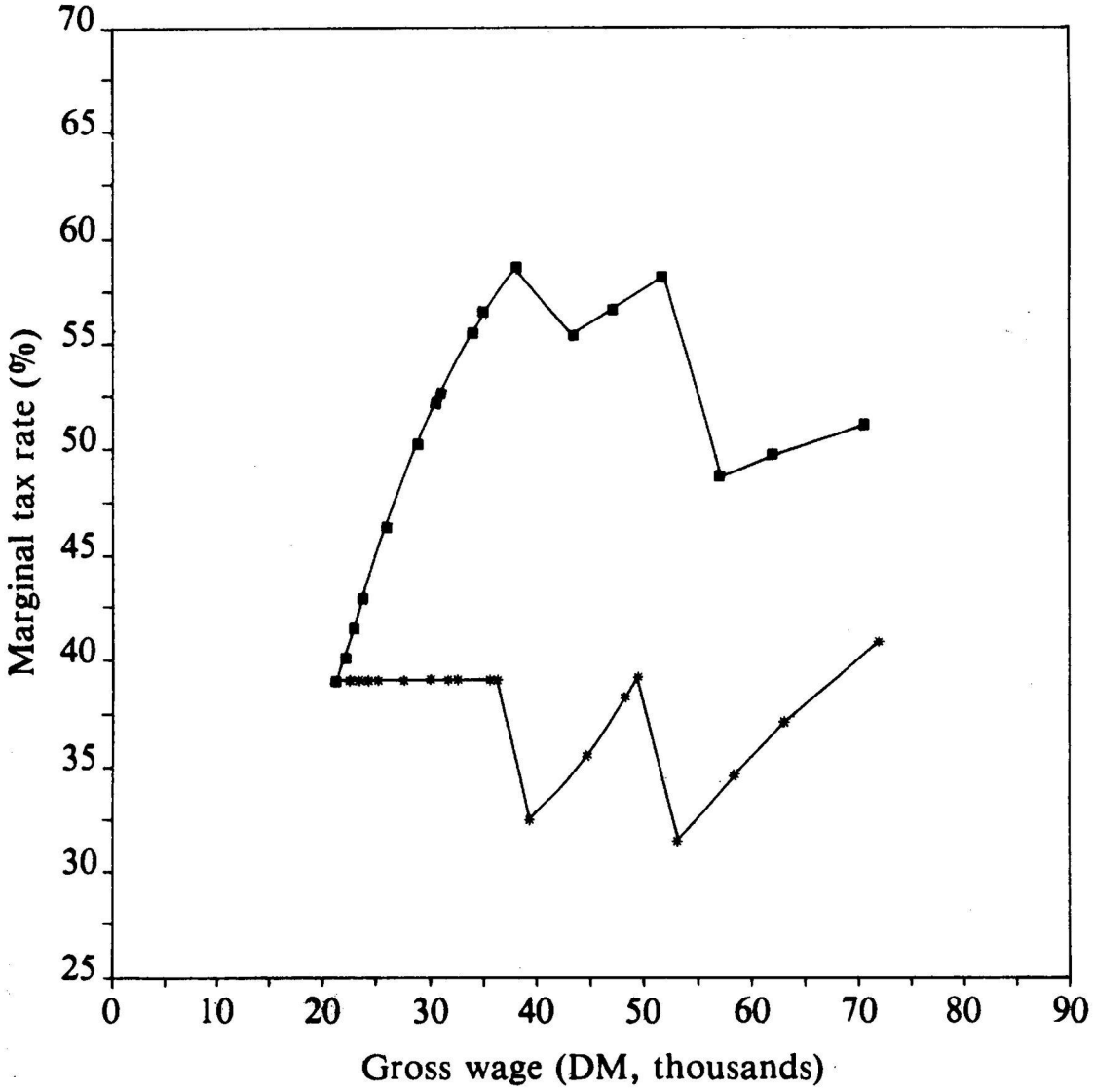
Very important—in both short and long term—is the impact on employment incentives for the normal working population of high and rising tax and contribution rates. To understand the extent of this problem, one must consider the total burden of current taxes and contributions. Figure 2 illustrates with figures from the wage scale for public employees (*Angestellte*). In the lowest wage group, an unmarried employee's marginal tax rate is 39.0 percent, including social insurance contributions; the marginal rate rises to 58.7 percent for a middle wage group, and after that it declines because the contribution ceiling for compulsory health insurance is reached. The rate increases in succeeding wage groups until, in the third but last group, the limits for retirement and unemployment are reached. After that, marginal rates increase only because of progression in the income tax.

The following percentages are marginal tax and contribution rates for a middle wage group (see Petersen 1981*a*):

(1) wage tax	41.7 percent
(2) employee contribution	17.0 percent
(3) church tax	3.8 percent
(4) indirect taxes	7.0 percent

The marginal burden thus reaches its maximum at about 70 percent excluding employers' contributions, or more than 80 percent including them. Unless there are substantial changes in tax and social law during the 1990s,[7] these marginal burdens will increase sharply if contribution rates alone are increased to hold today's pension levels to the current pension formula. Taking inflation into account, considering that the German tax

Figure 2
Marginal Tax Rates for Public Employees (Angestellte) 1979



Code: ■ unmarried employees * married employees.

Source: Petersen 1981a.

system is not indexed for inflation, a real decline in the employees' net after-tax income is likely.

Compared to other Western countries, the Federal Republic of Germany has already reached a threshold of marginal bur-

dens, especially for middle-income groups. Passing this threshold by further increases in marginal rates (e.g., to about 76 percent in the year 2000 excluding employers' contributions or to more than 90 percent including them, and to about 85 percent and 100 percent, respectively, in 2030) would constitute a serious work disincentive. A mass movement into the social welfare system cannot be ruled out, because social welfare payments are sometimes higher than the net incomes of workers in comparable situations.

As marginal burdens continue to increase, so will public awareness of them. Negative impacts on work incentives are possible if not likely, and we fear a growing movement into the tax-free and contribution-free underground economy. This would limit revenues more than ever, and would probably lead to a complete collapse of the social insurance system.

SOME DISTRIBUTIONAL ASPECTS

Few attempts have been made to analyze the redistributive effects of the German social retirement system within and between generations. Such an analysis must consider both the tax and benefit system, and not simply the benefit side in isolation. Given limited work in the area, the following remarks are necessarily speculative.

Redistribution between generations is becoming an increasingly important issue in public debate. While the mass media and special interest groups (especially trade unions) are still looking for additional "improvements" in social security, economists have begun to reflect on future problems, the first concerning the pension formula itself. Net pensions tend to increase more than net wages, since pensions are linked to average gross wages and are not taxed. Combined with rising contribution rates, this leads to a relative reduction of contributors' disposable income in favor of pensioners, a trend intensified by the growth of supplementary pensions and of income for pensioners from property which is taxed at low rates or not at all.

Regarding redistribution among those at work, following are some major variations in the way different workers are treated:

- Workers are taxed differently on their contributions. Because of varying tax exemptions (granted whether or not contributions are actually paid) depending on invididual income, marital status, and number of children, contributions are partly taxed and partly untaxed. Government officials, for example, get the same tax exemptions as other employees even though they pay no contributions for retirement security, and those exemptions reduce their taxable income.
- While contribution rates at any given time are unrelated to the number of children in a family at that moment, contribution rates, as noted above, depend very much on the relation between pensioners and contributors. The future number of contributors (and eventually, of pensioners) depends on the current number of children born, so future contribution rates are affected by current numbers of children. But families with children are not fully compensated for their part in sustaining the "generation treaty." Rather, they seem to be punished. As Schmidt-Kaler (1980, p. 70) has written, "The costs of children are largely privately borne, whereas the returns of children are socialized." Zeppernick (1979, p. 298) calls this effects "a completely underestimated redistribution mechanism between families with children and families without children." Some contributors attribute the decline in the fertility rate to this factor, at least in part.
- Parts of the German population are not included in the social retirement insurance scheme, notably the self-employed (who can become voluntary members) and government officials. Direct future burdens resulting from a declining population will therefore be borne only by compulsory members. Government officials will escape increasing contribution rates because their pensions are financed out of general tax revenues.

- A declining yet considerable share of total expenditures is financed by general revenue transfers. The redistributive effect of this reflects the redistributive effect of the whole tax system. The assumption seems to be correct that most redistribution measures only shift the burden within middle-income groups.

Redistribution within retired generations is linked to income distribution during their active years, but weakly. Because of World War II and other events, many of today's retired people receive low pensions due to their short qualifying periods. The introduction of a minimum pension in 1972 has reduced this problem, but widows in particular, who can claim 60 percent of their husbands' pensions, often have to live below the subsistence level. Of course, they have a claim on social welfare payments, but their children—if they can—have to reimburse what they receive. The "centenary" reform of 1984 will focus on this problem; an increase to 70 or 75 percent of the insurees' pension titles is currently under discussion.

Another problem concerns the cumulation of pension benefits from different sources, especially those for public employees (*Angelstellte*). The latter are compulsory members of the general social system and of an additional pension system which is supposed to raise their pensions to roughly 75 percent of their last gross wages. Since the pensions of public employees, financed by contributions, are untaxed, their net pensions often far exceed 100 percent of their last net wages. This is true for public employees at the upper end of the income scale as well as for singles, because both are subject to high marginal tax rates during their working lives. The effect is reinforced by the fact that additional incomes (e.g., from property and wealth) often are not reported and, if reported, are taxed at lower rates because of the high tax exemptions for pensions.

Summarizing, some redistributive elements within the social retirement system tend to favor the retirees with lower pensions. But the current tax regulations leading to factually untaxed pensions especially favor the well-to-do. It is difficult,

therefore, to appraise the net redistributive effects of this uncoordinated tax and transfer system for the aged.

THE CURRENT POLITICAL CLIMATE

Despite criticism, there is broad public support for a social insurance system in Germany. That support is so strong, in fact, that a well-timed, substantial reform will be difficult to implement. This may be why the political parties offer such relatively short-sighted solutions which do not address broader systemic problems, in particular those caused by demographic changes. On the contrary, to overcome relatively short-term labor market problems, solutions are considered which will only intensify future problems. This is particularly true of attempts to improve the labor market by enlarging the flexible retirement age and by further shortening the work week (more rapidly than productivity increases will allow)—proposals which will probably come to be regarded as inviolable rights and entitlements and which therefore will become irreversible. If so, all measures together will impair Germany's future growth potential.

Current official reports discuss three measures in particular:

(1) reestablishing an individual pensioner's contribution to social health insurance;
(2) changing the pension formula to adjust pensions at a percentage of net wages (after income tax and social security contributions); and
(3) changing the basis for employers' contributions from individual wages to total value-added of a firm (a so-called "machine tax").

Some politicians believe that the first measure alone would solve future problems. Up to now, contributions for social pension insurance also pay for pensioners' health insurance. But before individual contributions to health insurance are

introduced, pension benefits will be raised by the same amount; this increase then will be reduced gradually to 50 percent of health contributions. With regard to restraining expenditures, in fact, this measure is very weak and its redistributive effects are uncertain. The annual adjustment according to a percentage of net wages will reduce further pension increases but will leave the system's cumulative effects unchanged. The third measure (machine tax) is "revenue neutral."[8]

Other proposals have also been made by individual scholars and by commissions. Switching to reserve funding is frequently proposed—but this train, as noted above, has already left the station. Accelerated immigration of foreign manpower is also proposed to compensate for the increased German burden of aged persons, a burden which can be lessened only if the labor force is doubled between now and 2030. Since other developed countries face similar problems, it would be necessary to encourage the immigration of skilled workers from newly developing countries, thus causing a brain drain from those countries and sacrificing their current development strategies. Beyond that, several proposals concern the fact that contribution and benefit formulas do not take account of the demographic reproduction aspect.

The idea of increasing the general retirement age to 70, for instance, has not been raised in Germany and is not likely to be. In fact, there is currently talk of further reductions of the retirement age to solve labor market problems. If increasing the retirement age is not seriously considered, the reason can be found in the extent to which the retirement age of 65—which was established before World War I—has come to be regarded as a right (*sozialer Besitzstand*) which may not be violated. The existing flexible retirement system, however, is already open for a longer working life than 65, but incentives for the choice to work longer are not very strong. Incentives can be improved easily, leaving to the individual the free choice to retire, whereas a compulsory later general retirement age might result in a higher share of pensions paid to the disabled.

CONCLUSIONS

With a threat of bankruptcy hanging over the entire system, prospects for the German social pension system are rather gloomy. It is true that financial problems are nothing new; in the past they were always overcome by reforms—mostly by increasing contributions. But apart from the new beginning after World War II, the current system is faced with unprecedented problems. This is especially true of the demographic changes.

Four major problems plague the current system:

(1) The present system is so complex that, when it is combined with the possibility of cumulating benefits from different systems, no one really knows the actual financial status of a pensioner's household in Germany. This lack of information favors tendencies to add new programs, never to cut back old ones.
(2) This lack of knowledge is further confused by an uncoordinated tax and transfer system. Some pensions—such as the scheme for government officials—are taxed, but most are not. Pensioners' net incomes thus tend to increase faster than those of employees.
(3) With benefits rising more rapidly than contributions, the financial capacity of the system is almost exhausted. In the past, requests for increased and liberalized benefits were often granted without actuarial adjustments in contributions and benefits. In 1972 the self-employed were allowed to join social insurance and to take out subsequent insurance on extremely favorable terms. The flexible retirement age was not accompanied by an actuarial discount of pensions. At the time these changes were made, the costs were hidden; the great burden is still to come.
(4) Finally, the contribution and benefit formulas were more or less designed for an increasing population; they are not flexible enough to cope with fluctuating demographic developments as well.

Most proposals currently being considered contain worthwhile elements:

- Initiating individual payments by pensioners for their health insurance.
- Inserting demographic criteria into retirement insurance.
- Removing disincentives towards female employment and introducing special maternity allowances.

Other measures, too, should be implemented:

- Intensify coordination and integration of the different social insurance subsystems, integrating especially the government officials' (*Beamte*) pension scheme into the general system.
- Impose ordinary income taxation on pensions and other incomes of the elderly to correct the tendency of the present tax and transfer system to discriminate against working generations in favor of pensioners.
- Eliminate or restructure most "reforms" introduced during the last decade without an actuarial surcharge or discount; for instance, this would mean discounting benefits for people retiring earlier than 65 and increasing them for those retiring later.

Even with these and other reforms, doubts remain whether the present German pension system can survive. The most fundamental problem lies in a prevailing attitude in both political parties and bureaucracies that people are as poor, as uninformed, and as incapable of providing for themselves as they were when the country was much poorer in the last century. Therefore, this attitude concludes, the government has responsibility to do everything—and everyone has a right to an unlimited number of the resulting benefits.

Fundamental reform—which treats more than symptoms and goes to the roots—would restructure our social security system to increase reliance on individual responsibility. With such reform, compulsory social security would provide only basic protection, leaving further protection to individual

choice. The reformed system could bring together diverse elements and be integrated into the current overall tax system, including a negative income tax and indexation for inflation. In fact, German social security is already moving in this direction, incorporating degrees of coverage through firms' pension programs, through individual life insurance, and through other forms of individual saving—partly tax privileged.

A long-term perspective is as badly needed as it is regrettably absent. Because of its long development, social security obviously cannot be reformed overnight; we must commit ourselves to a long, slow process. The size of the German population is almost certain to experience a substantial decline in the decades just ahead. For this reason, unless social security benefits are reduced substantially or taxes and contributions increased, the present system will probably collapse. Between these policy options, increasing taxes is not a viable alternative at this point because high and rising taxes will have seriously negative incentive effects. The other alternative is to reduce benefits.

Solutions must somehow be found to safeguard the so-called "generation treaty" without imposing a hopeless burden on either current or future working generations. Maintaining tax burdens within tolerable limits is particularly important to maintain future economic growth which will permit increases in real income—or, at least, prevent declines. The challenge is there. We are sure that a free society will be flexible enough to find answers to it.

Chapter 6:

Social Policy, Higher Education and Environmental Economics

6.1.

World Crisis in Social Security: West Germany

Co-author Karl Heinz Jüttemeier

(Jean-Jacques Rosa (Ed): World Crisis in Social Security, Paris, San Francisco 1982, pp 181 – 205)

6.2.

Gloomy Prospects for Social Retirement Insurance
- An International Phenomenon

Co-author Karl Heinz Jüttemeier

(Intereconomics, Hamburg, Vol. 18 (1983), pp 11 – 17)

6.3.

International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care. Comment on Richard M. Scheffler

(Herbert Giersch (Ed): Reforming the Welfare State, Berlin et al. 1997, pp 261 - 266)

6.4.

Systemic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond

(Case Doradcy Sp. z o.o., Forum Ochrony Zdrowia. Warsaw 2004, pp 1 – 26, in Polish Language)

6.5.

Education Return and Financing: Donated Affluence as Consequence of Tuition Free Study Programs in Germany

(Finanzwissenschaftliche Diskussionsbeiträge Nr. 55, Potsdam 2007)

6.6.

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation

(Ecohydrology & Hydrobiology, Warsaw, Vol. 1 (2001), pp 46 – 58)

SOCIAL SECURITY

Gloomy Prospects for Social Retirement Insurance

An International Phenomenon

by Karl Heinz Jüttemeier, Hans-Georg Petersen, Kiel*

Recently, important experts have presented two studies concerning the current situation and future prospects of social retirement insurance in the Federal Republic of Germany.[1] Now there is also an internationally comparative study on the same subject available.[2] The German co-authors summarize the results of that study and add some proposals for further discussion.

During the last decade the social retirement systems of more and more Western countries were confronted with increasing financial difficulties. In public these problems are mainly seen and discussed under short-term, i. e. business cycle, aspects; but gradually more people are becoming aware of the fact that there exist some long-term, i. e. structural, deficiencies which are much more dangerous and might even be able to threaten today's system as a whole. Thus, the system which to a great extent represents that which is known as the "social progress of the 20th century" has to undergo changes.

So far, however, the history of public retirement insurance schemes seems to be a rather unique report of success. Originally, they were founded as a mandatory system of precautionary measures which a paternalistic state provided in order to protect its blue-collar working classes against poverty in old age. During the 1930s and 1940s social retirement systems began to incorporate the majority of white-collar employees and in the 1950s and 1960s they have even grown to cover almost everyone. In most of the industrialised countries transfer payments from social retirement insurances now constitute the most important, if not the sole source of income for the elderly.

Further common features characterizing the development of social insurance schemes in industrialised countries are:

□ During their initial phase they followed in principle the normal pattern of every private life insurance company, i. e. they were organized as funded systems. Thus, there existed a close connection between contributions paid by the active insurees and their future pensions; but unlike private companies no adverse selection took place and individual risk factors were disregarded. Consequently, redistributive effects were already incorporated from the very beginning, being at that time, however, of minor significance.

□ The second phase saw a fundamental change of the financing system. Apart from Japan, most social retirement systems left actuarial funding and turned to pay-as-you-go financing. This conversion occurred in the United States as early as in 1939, only a few years after its social security system was founded, whereas the European countries mainly switched to pay-as-you-go financing after World War II.

□ Finally, the close correlation between contribution payments and future benefits was dissolved, e. g. by introducing minimum pensions (Japan, France, Italy, Great Britain) or by calculating them according to minimum incomes (FR Germany), by taking into account only years with the highest active incomes (France, Great Britain), or by decreasing the retirement age without actuarially adjusting individual pensions (for

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[1] Cf. Transfer-Enquête-Kommission: Das Transfersystem in der Bundesrepublik Deutschland, Stuttgart, Mainz 1981; Deutscher Bundestag, Gutachten der Wissenschaftlergruppe des Sozialbeirats zu längerfristigen Entwicklungsperspektiven der Rentenversicherung, Bundestagdrucksache 9/632, 3. 7. 1981, cited in the following as "Sozialbeirat".

[2] Cf. Jean-Jacques Rosa (ed.): The World Crisis in Social Security, Fondation Nationale d'Economie Politique and Institute for Contemporary Studies, Paris, San Francisco 1982.

instance, the option of earlier retirement age, i. e. the flexible retirement age in FR Germany). All these measures led to a strong increase of redistributive elements within the social retirement systems.

Some further common characteristics can be seen in the fact that in nearly all countries females seem to be favoured by earlier retirement ages and – likewise a world-wide phenomenon – that public employees (government officials) have pension entitlements usually considerably exceeding the replacement rate (average benefit relative to average salary) of private sector employees. Italy seems to be at the top: if one joins the Italian public services at the age of 20, males can retire at the age of 40 and women at the age of 35 (if married or with children); then their replacement rate amounts to 60 %.[3] In France government officials as well as employees of the nationalized industries get comparatively higher pension payments; resulting deficits of these special systems are borne by the general social retirement system.[4] In the Federal Republic of Germany pension levels for government officials are considerably higher than those arising from the general social pension scheme.

Apart from problems depending upon an individual country's specific regulations for its social retirement system, there are two important common factors which have caused the increasing financial difficulties. Firstly, the elasticity of the expenditure side of the social insurance budgets is – not only in the short run – considerably higher than that of the revenue side and, secondly, the population is aging and the age structure will deteriorate even more rapidly in the decades ahead. In other words, the increasing deficits (or decreasing surpluses) will have increasingly structural causes.

For a better understanding of the effects on the social retirement insurance scheme, one has to visualize the main elements of the two possible financing procedures. Somewhat simplified, the alternative methods can be described as follows: in a funded system expenditure is a function of revenue (because benefits are closely tied to contributions) and vice versa for a pay-as-you-go system. In the first case the size of contributions is contractually fixed and the later pension payment results from the accumulated fund and its compound interest accruing in the course of time; since the level of pension benefits is by no means fixed and can eventually also converge towards zero, deficits do not occur. In the latter case, on the other hand, the levels of pension payments are politically fixed, i.e. a replacement rate which might depend on the active income, contribution period etc., is legally determined by a pension formula; deficits do not arise as long as contribution payments can be adjusted to meet the financial requirements. An increase in the contribution rate (or the payroll tax rate), however, is inevitable if the dependency ratio of aged persons (ratio of workers to retirees) is falling due to declining fertility or higher pensions are provided resulting from a politically initiated rise in the replacement rate.

Most politicians engaging in social policy seem to prefer pay-as-you-go financing systems. This is quite understandable since from their point of view this method is doubtless more pleasing: the introduction of redistributional measures can be very easily implemented within the pension formula without burdening in the short-run the contributing insurees with perceptible financial burdens. This was especially true under the prevailing post-war conditions of most industrialised countries. A growing population and an annual increase of productivity even gave the false impression that pay-as-you-go financing is the cheaper procedure, since under such circumstances even a constant contribution rate (related to a continously growing assessment basis) always led to higher revenues. Thus, room for redistributional manoeuvres seemed to open up which the politicians have used excessively for improvement in benefits. As a result, each insuree contributed less to the system than he got back as pension payment because those benefits were borne by a larger and/or more productive generation of employees. During this phase of development the respective generation of retirees absorbed "windfall profits" and the politicians made their "political gains". But this kind of mishandling the pay-as-you-go financing method by one-sidedly passing on surpluses in the form of improved benefits sooner or later must lead to deficits or growing contribution rates. Now when the population is starting to decrease and growth rates are declining or even negative the redemption of the unpaid bill from the sixties and seventies is becoming more and more difficult.

Deteriorating Dependency Ratios

In particular, the foreseeable demographic developments will soon require a reform of the benefit structure; otherwise contribution rates will have to rise to a level which is today completely unimaginable. All industrialised countries forecast that their dependency ratio of aged persons will greatly deteriorate and that the ratio of workers to retirees will reach 2.0 or – depending

[3] Cf. Onorato Costellino: Italy, in: Jean-Jacques Rosa (ed.), op. cit., p. 51.

[4] Cf. Jean-Jacques Rosa: France, in: Jean-Jacques Rosa (ed.), ibid.

on the assumptions regarding future birth rates – might even fall considerably below this ratio.[5] Presuming today's benefit levels and a future economic growth rate of 2 or 3 %, it is expected that, for instance,

☐ in the United States an increase in the payroll tax rate (including the employer's contributions) from about 10 % today to more than 26 % will be necessary;[6]

☐ in Japan, which forecasts a dramatic increase in the dependency ratio of aged persons, the ratio of contributors to beneficiaries will decline from 8.2 in 1980 to 1.6 in 2025. But even under the Japanese funded system the contribution rate will have to increase from 10.6 % to 16.0 %. In the case of a pay-as-you-go financing system Japan today would have a contribution rate of only 5.5 %, but then would have to increase the rate to 30 % or more by 2025;[7]

☐ in the Federal Republic of Germany a doubling of today's contribution rates will be necessary;[8]

☐ in Sweden the contribution rate might rise to 24 % in 2020 which means more than double the 1980 rate.[9]

The social policy which was applied worldwide during recent years did not see, or did not want to see, the long-term financial consequences. Thus, on the expenditure side generous benefit regulations were introduced without paying sufficient attention to the long-term financial requirements. For the German retirement insurance, for instance, huge surpluses were forecast which then were actually distributed in the 1972 reform. The big mistake everywhere consisted in the fact that politicians reacted to fluctuations in the status of liquidity asymmetrically: revenue surpluses were used for improvements in benefits whereas financial bottlenecks in the liquidity situation were taken as a chance to increase the contribution rates. As a result, the once close link between individual contributions and individual pension payments was weakened further. It seems to be a matter of fact that governments pay more attention to immediate issues which instantly provide for political benefits during the next election campaign. In this respect, the pay-as-you-go financing rule literally does not set up any obstacles preventing politicians' short-sighted exploitation of the rule.

Basic Social Security Rates

The table compares the basic social security rates for the countries in this study. In considering these figures, it is important to recognize their limitations, since it is almost impossible to give an exhaustive description of all structural provisions determining social retirement

[5] In the Federal Republic of Germany most prognoses indicate that in 2030 the ratio of workers to retirees will be 1.2 : 1 and, pensions of government officials included, perhaps 1 : 1. Cf. Hans-Georg Petersen: Sicherheit der Renten? Die Zukunft der Altersversorgung, in: Hintergründe, Vol. 4, pp. 135, Würzburg, Wien 1981.

[6] Cf. Sherwin Rosen: United States, in: Jean-Jacques Rosa (ed.), op. cit., p. 152.

[7] Cf. Noriyuki Takayama: Japan, in: Jean-Jacques Rosa (ed.), ibid., pp. 77.

[8] Cf. Helmut Meinhold: Ökonomische Probleme der sozialen Sicherheit, Kieler Vorträge, N. S., Vol. 86, Kiel 1978.

[9] Cf. Ingemar Stahl: Sweden, in: Jean-Jacques Rosa (ed.), op. cit., pp. 107.

Comparison of Basic Social Security Rates

Country	Earnings test	Contribution rate (%) Basic	Contribution rate (%) Supplemental	Ceiling ($ 1,000)[a]	General revenue	Share of GNP (%) Basic	Share of GNP (%) Supplemental	Replacement Rate (%) Basic	Replacement Rate (%) Supplemental
France	No	12.9	–	10.5	–	7.65	–	41.9	–
FR Germany	Yes	18.5	–	22.0	14	11.2	–	47.0(m) 37.5(f)	–
Great Britain	Yes	20.45[b]	–	16.0	15	5.5[c]	–	23.0	25.0
Italy	Yes	24.2	–	–	13	12.0	–	30.0/80.0[d]	–
Japan	Yes	10.6(m) 8.9(f)	–[e] –[e]	22.0	20	3.76	–	45.0[f] 42.0/100.0[f]	combined
Sweden	Yes	8.4	12.25	–	–	6.2[g]	3.3[g]	60.0	combined
Switzerland	No	8.4	6.4	–[h]	16	5.8	4.1	50/150[h,i]	combined
United States	Yes	12.26	–	29.7	–	12.8	–	45.0	–

Key: (f) female, (m) male.

[a] Dollar value based on exchange rates of 1 July 1981. [b] The British rate is 7 % less for those who choose to contract out of the government system. [c] Private retirement insurance of those who contract out equals another 5 % of GNP. [d] Replacement rate in Italy ranges from 30 % up to 80 %. [e] Japan's tax rate includes both basic and supplemental insurance. [f] Average replacement rate in Japan is 45 %. Japan's richest pensioners receive 42 %; the poorest receive more than 100 %. [g] Medical portion of Swedish social security is 5 % of GNP. [h] In Switzerland, the supplementary programme is undergoing revision, which is expected to levy about 15 % on incomes between $ 8,200 and $ 24,600 per year. In the basic programme, there will continue to be no ceiling. [i] For couples with incomes between $ 3,600 and $ 21,800.

Source: J. J. Rosa, A. L. Chickering: A political dilemma, in: J. J. Rosa (ed.): The World Crisis in Social Security, Paris, San Francisco 1982, p. 219.

insurances in individual countries. Pension levels for most countries fall in the range of 40 to 50 % (replacement rate); only two countries, Sweden and Italy, exceed this range. And since in all countries benefits are related to contributions, at least to some extent, it is not surprising that replacement rates positively correlate with contribution rates, thus again showing Sweden and Italy at the top of the scale. However, some countries transfer additional funds from general revenues to their social security systems. Taking these into account, too, the cross-country comparison reveals that especially the British and German systems seem to be quite "expensive" ones: average levels of replacement rates go along with high levels of contribution rates plus a substantial transfer rate from general budgets. In the case of the United Kingdom it should be added that its pension system combines a network of private occupational pension schemes with a comparable state scheme.[10]

Shift into the Underground Economy

In most industrialised countries public pension insurances are today already facing severe financial stress and will do so all the more when the projected changes in the population's age structure come into effect. Current social policy, however, still carries on on the basis of the principles established during the initial phase, disregarding the differences between today's situation and that of the initial position as well as changes in the insurees' behavioural patterns which have occurred since then. The success of old age security, especially that provided by social retirement insurance, has led to the result that the equation "pensioner depending mainly or totally on social security means poverty" is becoming more and more dubious.[11] But, nevertheless, even such entitlements to benefits which originally were meant to cover only really poor groups of pensioners are now accessible to larger sections of the population. With the best of intentions to solve the problems of a few, politicians introduced general regulations and now they look surprised that the legal entitlements thus constituted are claimed in general, possibly even by those wealthy retirees whose individual level of income does not at all demand any kind of socially motivated protection. Politicians of nearly all countries are lamenting quite a lot about this spreading attitude of moral hazard concerning social security benefits. But their response resembles rather a tragicomic attempt to criminalize such behavioural patterns by tightening up existing laws or introducing new and complicated regulations which mostly show themselves to be inefficient but add to the system's complexity – an optimal prerequisite for moral hazard. But does it really make sense to blame the recipients which, living in a market-oriented environment, show economically rational reactions towards the social security system?

Too much altruism is demanded if the single citizen is asked to voluntarily disclaim the benefits arising from advantageous regulations which his neighbour possibly already receives. Thus, for instance, in Germany hardly anyone renounces the extremely favourable option for an earlier retirement age being financed by all active insurees, because those perhaps willing to work longer would be discriminated and be called fools in public. It is not the citizen who failed, but politics: perpetuating old political goals by never analyzing if and to what extent they are already achieved, and exercising justice by taking into account everyone and everything, inevitably must lead to a complex social security system and in most countries also to a likewise complicated tax system. The different regulations and provisions for exceptions have become non-transparent and incomprehensible for the majority of people but exploitable for a minority. Thus the attempt to do justice to everyone rather produces injustice for a great many *(summa ius, summa iniuria).*

Sure, for a certain time politics can continue as if nothing is going to happen. But sooner or later demography will require heavy interventions in today's security systems; in fact, the stronger recessions and the lower future growth rates are, the sooner the need for intervention. Continuing to balance the inherent dynamics of the expenditure side by exclusively burdening working generations through tax rate increases, soon will take us to the limits of taxation: more and more employees will adopt new behavioural attitudes in order to evade additional burdens or even taxation altogether. Opportunities of evasion offer themselves through social welfare, early retirement, and the underground economy.

Some European countries should serve as a warning signal. In this respect the Italian example is rather illustrative and has already entered economic literature as "Italy's new economic miracle".[12] It is mostly agreed among experts that the growth of the Italian underground economy is to a large extent induced by the existing tax and transfer system, which, for instance, offers high replacement rates, earlier (flexible)

[10] Cf. R. Hemming, J. A. Kay: Great Britain, in: Jean-Jacques Rosa (ed.), ibid., pp. 29.

[11] Cf. Sozialbeirat, op. cit., para. 9.

[12] Herbert Giersch: Comment on Paul Samuelson's Paper: The World Economy at Century's End, Kieler Arbeitspapier No. 110, Kiel 1980, p. 7.

retirement ages, generous criteria concerning disability, etc. Onorato Costellino states in his analysis: "Italy has superimposed a strong dose of Mediterranean light-heartedness."[13] Nonetheless, the Italian economy still works well even in the form of a "workable anarchy", in contrast to many socialist countries in Eastern Europe which face similar tendencies towards an underground economy but are facing total bankruptcy.

In the Federal Republic of Germany, obvious preliminary symptoms of an underground economy can be seen. But the empirical evidence for a strong increase is not very impressive[14] even though the marginal burdens of taxes and contributions on the working generation's incomes have reached top levels as compared to international standards. Probably, the speed of adaptations in behavioural attitudes also depends on the prevailing national mentalities and the threshold beyond which adjustments might occur massively differs from one nation to another. True, it is almost impossible to define objective limits of taxation but the present experience shows that today's subjectively felt limits already create big problems in financing public expenditure.[15]

The shift of economic activities from the official into the underground economy must not necessarily endanger current societies; some aspects may even have their positive effects on the further development of Western societies.[16] In any case such a development certainly would contribute to a further deterioration of social retirement insurance schemes' financial status because revenues would decrease and, fixed replacement rates assumed, future deficits would increase.

Inherent Structural Deficiencies

Of course, the gloomy prospects of the social retirement systems do not lack some speculative elements; the underlying assumptions could well prove to be too pessimistic. Looked at today, it is often hard to imagine that fertility rates, or the rate of growth of the economy, might strongly increase again; in both cases financial problems would be less serious. However, the analysis clearly shows that the deficitary trend is caused primarily by the systems' inherent structural deficiencies. No matter how future developments may actually come true, fundamental reforms of the existing social retirement insurance schemes are inevitable.

Modifications could be done on either the revenue or the expenditure side. Since today's contributions are already felt to be too high and further increases bear the great danger of strong disincentives for the working generations, reformatory efforts concentrate on reductions of social security benefits. The increasing of present retirement ages is probably the proposal most commonly preferred in international discussions.

The United States, for instance, is considering an upward adjustment of the retirement age from 65 to 70 while European countries seem to focus more on a model with flexible retirement ages which provides for an actuarial discount or bonus but leaves the individual free to fix the date of retirement. In the end both models do not show any great difference; in either case it will come to a relief of the expenditure side. Other proposals concern the methods of indexing benefits, a reduction of redistributive elements, etc.; most of these proposals are constructed according to an individual country's specific circumstances.

Economic growth and the dimension of expected financial problems are negatively correlated: the lower future growth rates the bigger financial difficulties will turn out to be. In this context some economists emphasize that social security systems per se may have retarding effects on growth. Especially some empirical studies done by Feldstein[17] seem to suggest that today's pay-as-you-go financing has reduced private savings. Indeed, his ultra-rational life-cycle analyses allow for such conclusions but, on the other hand, the studies do not provide unequivocal evidence. The variables of the model are highly intercorrelated and the influence of social security can hardly be separated from other motives determining private savings behaviour. And developments in Germany also provide no evidence for his thesis. Although the country has very high rates of social security contributions its savings rates are among the highest in the Western world.

For contemporary social policy a switch from pay-as-you-go financing to a funded system – as is implied by the Feldstein studies – is of minor significance: in a phase characterized by a decreasing number of contributing insurees and an increasing number of pensioners, reserves cannot be built by a funded system either, because even the accumulated fund

[13] Onorato Costellino, op. cit., p. 56.

[14] Cf. Hans-Georg Petersen: Size of the Public Sector, Economic Growth and the Informal Economy. Development Trends in the Federal Republic of Germany, in: The Review of Income and Wealth, Series 28, 1982, pp. 191.

[15] Cf. Sozialbeirat, op. cit., para. 171.

[16] Cf. Hans-Georg Petersen: Size of the Public Sector, op. cit.

[17] Cf. Martin Feldstein: Social Security, Induced Retirement and Aggregate Capital Accumulation, in: Journal of Political Economy, Vol. 82, 1974, pp. 905; Martin Feldstein: Social Security, in: Michael J. Boskin (ed.): The Crisis in Social Security: Problems and Prospects, Institute for Contemporary Studies, San Francisco 1979, pp. 17.

itself is needed to meet the current pension payments. Such is the situation in most industrialised countries and changing the financial rule in order to build up reserves would mean a strong increase in today's contribution rates, which would then all the more create disincentive effects. As things are, switching to a funded system would not solve financial problems; it is an unimportant alternative.

Partial Corrections or Total Turnabout?

In the Western economies there seems to be an implicit understanding among most political parties that social retirement systems have to be reformed but should not be abolished. However, in which way and to what extent such reforms have to be carried out is a matter of controversy: some people believe that a few partial corrections of undesired developments will be sufficient to safeguard social security systems in the long run, leaving the basic idea of a paternalistic system unchanged. Others think a reorientation of social policy to be necessary and propose a total turnabout, i. e. turning away from traditional principles and policy goals.

Partial repairs surely will reduce some of the current defects; however, the question remains whether or not they will be able to stabilize social security systems in the medium and long run. Probably not! As already discussed above there are three elements jeopardizing social security in the long run: (1) demographic development trends, (2) the high expenditure elasticity resulting from the present kind of benefit calculation, and (3) undesired, or rather unanticipated, behavioural adaptations by the insurees. Demographics belong to the basic data which for the retirement systems represent exogenous variables and can hardly be influenced. As opposed to this, expenditure performance and behavioural adaptations is a must.

In the past a great deal of social progress was obviously achieved, but at the same time a huge redistributive machinery came into operation which, according to public opinion, handles enormous sums while showing only small redistributive net effects. This raises general opposition which can hardly be overcome by linear cuts within the social security systems. As far as the Federal Republic of Germany is concerned the problems are of a structural kind. Linear cuts would be an inadequate method of abolishing existing undesirable trends: rather, they would prolong them, if not even lead to an aggravation. But if substantial reforms are necessary, towards which aims should they be directed? What is needed is a conception, a target to pursue; its formulation is politicians' primary task.

It is an easy matter to list dozens of objectives which the public associates with social security. The German Social Advisory Council (Sozialbeirat), for instance, specifies twelve main objectives, among others also "stability of matrimony and family, social mobility, avoidance of solitude".[18] However, it seems to us that for the basic idea of any social retirement insurance there is in the end only one relevant objective and that is to secure incomes in periods of life during which individuals are no longer able to earn their living. In socially oriented economies this aim is more or less achieved if people do not have to worry about how to meet everyday material needs. If only basic protection should be provided, leaving higher levels of protection to individual choice, or if social security systems should go beyond this, is a matter of society's agreement. In the first case elements of an individual responsibility are emphasized while the second case accentuates more the paternalistic attitudes.

More Regard for Individual Preferences

100 years of social security policies and the coinciding great economic progress have brought about an important improvement in the standard of living for the vast majority of the population in the industrialized countries. People are no longer as poor, as uninformed, and as powerless as their ancestors once used to be. And to the extent that most employees' level of income and wealth has risen, the once great need for public compulsory protection has declined. Given these facts one should expect revisions of today's social retirement systems towards more flexibility with regard to individual preferences. Retirement systems just providing basic protection seem to be in a better position to take into account such considerations and they might even be better prepared to get over the expected long-term financial crisis. Some of the aspects of this will be discussed below.

Today's system of social retirement security is the outcome of a long historical process of development; often the schemes are very complex and consist of a variety of different kinds of insurance such as, for instance, mandatory public systems, supplementary public systems – some mandatory and some voluntary –, occupational systems organized on an intra- or inter-industry basis with regional or nationwide significance, voluntary individual insurance contracts some of which are tax privileged, and also social welfare payments. It is not astonishing that these complex systems do not follow one or two basic principles but rather form a conglomerate of many ideas, partly

[18] Cf. Sozialbeirat, op. cit., para. 34.

contradicting each other. Thus the systems are far away from being rationally constructed: levels of replacement incomes, qualifying requirements, and methods of financing differ to a very large extent and, as a consequence, often different amounts of benefits are granted for identical factual situations. In particular, government officials' pensions are extremely privileged and other groups are able to cumulate benefits out of the different sections of an uncoordinated system. Therefore a harmonization should be aimed at in which the mandatory public systems could well be attributed the role of providing basic social security.

The benefits from such basic programmes must be indexed in order to guarantee a constant relative share of a socio-cultural minimum protection over time. Higher replacement rates exceeding minimum security should be left to individual responsibility and could well be assigned to supplementary programmes. As far as they are organized within the existing public systems they must strictly follow the principle of equivalence, i. e. benefits are granted according to contributions paid. But forms other than saving through insurance are also conceivable, and especially the possibility of individual wealth accumulation might gain greater significance as compared to the present. In any case, a restructured social retirement system which increases reliance on individual responsibility does not have to exert the pressure of moral suasion on the population's self-control in order to avoid an excessive exploitation of legal entitlements vis-à-vis anonymous public institutions.

Reform of the Tax System

However, harmonizing the social retirement schemes will not be possible without substantial reforms of today's tax system. The current financial crisis of public budgets should really be taken as a good chance to integrate most transfer payments into the system of income taxation. Thus the problems of cumulation benefits out of an uncoordinated tax and transfer system will diminish which, for instance, in Germany are giving rise to growing concern. Taking everything into account the introduction of a system of negative income taxation would probably be the best solution, at least one of the most bitter reproaches concerning today's huge redistribution machinery could be eliminated, that is, redistributing money only from the left-hand pocket to the right-hand pocket.

In spite of all difficulties, radical cuts in the existing social security systems could be avoided if the reorientation of social policy started in the near future. In fact, the sooner reforms are undertaken, the less severe the burden of demographic and financial constraints will be; but the longer we wait, the more drastically contribution rate increases and/or benefit cuts will have to come into effect. There is still enough time left for a slow process of stepwise reforms, but, unfortunately, legislative authorities do not seem to be interested in spending much time on it. Thus it is not surprising that the political discussion on new long-term perspectives is still as badly needed as it is regrettably absent. It seems to us that the most crucial point is to encourage today's policy-makers and the public to take these issues seriously and act on them.

Demography, increasing moral hazard, and a growing underground economy will make a fair distribution of future burdens difficult if not even impossible. Unless social security benefits are reduced substantially or taxes and contributions are increased, the present system will collapse. Among these options, increasing taxes is not a viable alternative because high and rising taxes will also have seriously increasing disincentive effects; the other alternative is to reduce benefits. Somehow solutions must be found to safeguard the so-called "generation treaty" without imposing a hopeless burden on either current or future working generations. Perhaps politicians should call to mind what kind of prospects for the future are offered to young people: for the next ten years they will be confronted with high unemployment and, correspondingly, with restricted alternatives for training on the job, but at the same time during the next decade when their chances start to improve, the vast increase of expenditure for old-age security starts, too. Do we really believe that we can saddle every burden only on today's young generation?

Often, criticisms and the resulting proposals for new concepts are defamed by pressure groups as "social dismantling", but if we again try the old long-standing recipes, substantial social cutbacks will indeed be inevitable. It is high time to tell people that some of the traditional aims of social policy cannot survive in the long run and that it would be better to rely on one's own responsibility instead of trusting blindly in governments', politicians', bureaucrats' and pressure groups' capability of making the best of it. On the contrary, it seems more likely that informed individuals are better prepared to look further ahead than most politicians who – due to their limited terms of office – tend to pay more attention to immediate issues bringing immediate political gains. Unfortunately, in twenty or thirty years we can no longer call them to account for the damages: once the horse has bolted, it is too late to lock the stable door.

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Comment on Richard Scheffler "International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care"

Hans-Georg Petersen

Doubtlessly, Richard Scheffler has written a fine and truly convincing paper in which he very ably summarizes the fundamental issues of health care as well as the current patterns of reform in the United States, the United Kingdom, and the Czech Republic. In general, the results of the study are consistent with and reinforce those made of other countries' public health care or social health insurance systems. With regard to most of the evaluations made in this paper I can fully agree. But in view of the discussions and developments in Germany, I must confess to a certain skepticism. Therefore, the tenor of the paper seems to be somewhat too optimistic. I will demonstrate this by focusing upon two of the three c's discussed in Scheffler's paper: coverage and control.

I Coverage

Obviously, the question as to who is covered by health insurance and how he/she is covered (under a voluntary or a compulsory system) is one of the core problems of social security. However, the coverage problem should not be reduced to the extension of membership but should also include the question as to *what is covered*; a question which is of utmost importance for a compulsory public health care or social health insurance system. In both systems the false impression that uncharged services are available leads to the phenomenon of moral hazard. This phenomenon manifests itself principally in a larger incidence of the hazard, thus increasing the "need" for the benefits provided by the insurance scheme. Citizens then consume more of the services priced at a marginal cost of zero than they would if these services (including sickness leave, a problem which is currently high

on the agenda) were priced at their true marginal cost. In addition, the overall allocational efficiency of the economy is reduced because, at least in the health sector, the fundamental issue of scarcity is neglected.

The necessity to limit expenditure in the German social aid system became obvious already during its introduction. This was done by defining a minimum basket of private goods, whereby the definition has often been revised in accordance with real income growth. In spite of all the problems involved, it has been possible to determine what is necessary for an individual or a household. With regard to social health insurance, however, the introduction of a corresponding minimum basket of health goods has not yet been discussed extensively, especially not in the public sphere. Naturally, serious ethical questions do arise, but are they really different and more serious than in the case of minimum income? The *Götter in Weiß* (gods in white, i.e., physicians) have been extremely successful in exhausting the ethical problems of health care, leading them to the top of the German income scale (see Petersen, 1995).

Making all the extremely modern medical facilities (which are extremely cost-intensive, too) available to everybody in the society, violates the basic economic problem of scarcity. In the case of private goods, at least today, it is generally agreed that the Mercedes Benz for everybody is a utopian rather than a real world phenomenon. Obviously, providing answers to the question "what has to be covered" to meet the scarcity condition is a very unpleasant task. But for a large number of physicians, scarcity is almost a daily phenomenon—one that became such long before fixed budgets and quotas were implemented. Especially with regard to the limited beds in intensive care units, decisions with respect to scarcity have to be made (often by ethical commissions). Important arguments are age, number of relatives, breadwinner of the family, etc.: in other words an informal cost-benefit analysis is made.

Fortunately, not all health goods are so closely related to basic ethical questions; such questions arise less or do not arise at all with regard to cosmetics and cosmetic operations, dentures, over-the-counter pharmaceutics and medications for health conditions not necessarily requiring treatment, etc. But even as concerns these, mainstream public opinion, including opinions expressed by the mass media, is that they should be covered by the social insurance scheme—which is the result of an ongoing disinformation strategy based on false cost and price

signals. Therefore, the problem of what has to be covered must be put into the focus of the academic and public discussion. I think that especially what, and not who, should be covered has been the main topic of the discussions about the introduction of a social health insurance in the United States. The American politicians who opposed the Clinton proposal obviously got the correct impression of the German system. As long as the "what" is not answered, cost explosions are a built-in phenomenon in social health insurance or in public health care systems.

Another serious problem which is closely connected with the question of "who is covered" is adverse selection. Apart from some political considerations made by Bismarck, adverse selection was the main argument in favor of the introduction of social health insurance (see Petersen, 1989) in Germany. Perhaps because of the then lacking insurance theory, which has mainly been developed after World War II, and the strong believe in state interventionism, a powerful alternative—which would have promoted and not replaced the market system—had not been discussed. In view of today's insurance markets, which are more or less regulated, the option of private insurance in which the bad risks are individually subsidized seems to be much more promising and efficient. In a private health insurance scheme, at least for most of the citizens, the coverage decisions are made by single insurance contracts according to the individual (ethical and economic) preferences. Politicians cannot then be blamed for apparent wrong ethical judgments, as is the case in our current systems, so that political pressures on them are substantially reduced.

II Control

The trend towards quasi markets, as described by Scheffler, can hardly be observed in Germany and if such markets were to be implemented, the question would remain whether they are capable of overcoming the current malaise within our public health care and social health insurance systems. A brief look at the German social health insurance system gives proof enough that treating symptoms by introducing some market elements is insufficient. Figures 1 and 2 contrast private health insurance as a market system with the current regulatory mechanisms in place for social health insurance, whereby, for the sake of simplicity,

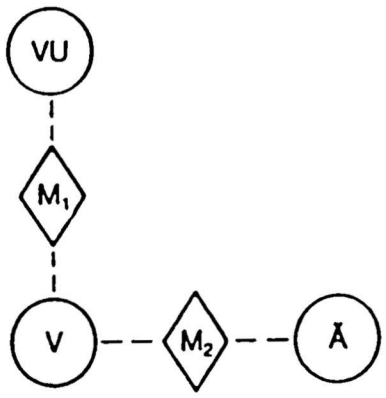

Figure 1. Private Health Insurance as a Market System
Source: Herder-Dorneich (1980, p. 37).

the hospital sector as well as the pharmaceutics industry are neglected (see Herder-Dorneich, 1980). In the model of private health insurance (see Figure 1), we have three bargainers: the insured, V, as demander of health goods (here: out-patient physicians' services), the physicians, $\ddot{A}$, as suppliers of health goods, and the insurance companies, VU, as suppliers of health insurance polices (cost coverage). These bargainers are connected by two markets: market 1, M_1, for insurance services, and market 2, M_2, for health services. Without going into all the details (see Petersen, 1989, pp. 142), it should be noted that the insured, V, directly demand health services from the physicians and pay real market prices. The receipts which the insured, V, obtain from the physicians, $\ddot{A}$, are transferred to the insurance companies, VU, which reimburse the insured. The insured have the full sovereignty of consumption with regard to the choice of the insurance and the physician, and they have full information on prices and services, so that a clear cost consciousness does exist.

In comparison with the model of social health insurance (see Figure 2), two other (groups of) bargainers are added: First, the physicians' organization, KV, as an institution which is responsible for the distribution of the total amount of insurance revenue provided by the social health insurance, K, for physician's services to the individual physicians. Second, the federal government politicians, R, who have the main responsibility for insurance coverage and budgets. In addition, the market relations within the private insurance model are replaced by electoral systems, $W_1 - W_3$, and a medical card system (often called quasi market[1] QM) which is the entrance key to the health services.

[1] The term quasi market is somewhat misleading because neither information on medical services nor on the cost of services are given to the insured. It is a voucher

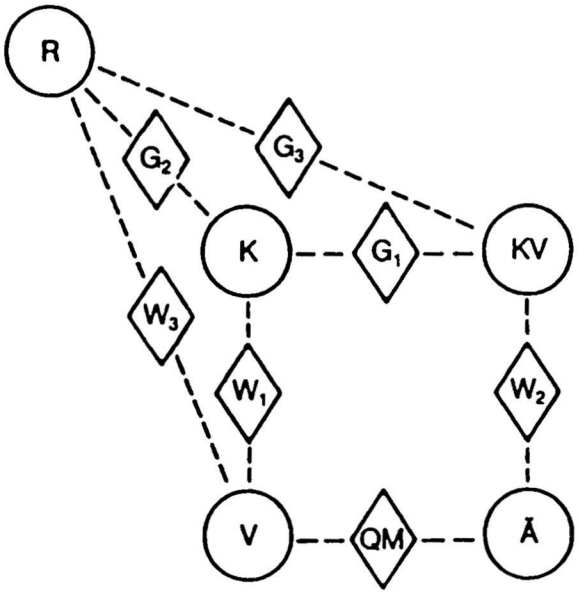

Figure 2. Steering Mechanism of a Social Health Insurance *Source:* Herder-Dorneich (1980, p. 35).

Consequently, the network of relationships between the bargainers becomes much more complex.

The insurance market, M_1, is replaced by the election of membership representatives to the social health insurance, W_1, and an electoral process, W_2, is also implemented between the physicians, $\ddot{A}$, and the physicians' organization, KV. The relationship between the social health insurance, K, and the physicians' organization, KV, is regulated by group negotiations, G_1, and corresponding group negotiations, G_2, take place between the federal government and the social health insurance, K. The general elections for the federal parliament, W_3, are an expression of the relations between the federal government, R, and the insured, V.

With regard to public choice theory, all bargainers have massive self-interests which impair, at least partially, the overall efficiency of a market economy. Because the insured continue, as a result of their strategy to maximize individual utility, to obtain high-quality medical services at the most favorable insurance premium, and because there is a lack of information on the services supplied by the physicians and the corresponding costs, cost consciousness is inevitably reduced. Because

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or purchase permit system which on the part of the insured creates the illusion that health services are zero priced—with all the well-known negative consequences for allocation.

the medical card system creates false information and illusions, the propensity to moral hazard behavior is increased. In comparison with a private insurance system which consists of several competing private health insurances, a compulsory health insurance system covers a much larger membership. Because the costs of moral hazard are distributed among all members, at least in the beginning, the per capita cost of moral hazard for the individual member in the social insurance system is lower than in a smaller private one. Hence, the possible individual profit is high; the individual cost-benefit analysis demonstrates that moral hazard is profitable as long as it does not become a general phenomenon.

Therefore, to rely solely on quasi markets or on the introduction of some market elements into the social insurance system might currently be the only politically feasible strategy, but it remains a strategy of curing symptoms. It is quite obvious that political group negotations are instruments which may be popular with social scientists, but what is created instead of the alleged market failures of private insurance markets is political failure, governmental failure, electoral paradoxes, bureaucratic failure, etc. Causal therapy would involve strengthening the insurance markets by providing effective regulation and by subsidizing the insured individual who would otherwise be hit by adverse selection because of a bad personal risk structure. The latter is an important task of a socially oriented market economy which directs its support to the really poor within society.

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Systematic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond

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I. Introduction

Since more than two decades at least in every second or third year after a so-called fundamental or even centennial reform in Germany another reform process has been necessary to combat the ever increasing deficits in the social health insurance system, in the past mainly cured by permanently increasing social security contributions.[1] Since the ancillary wage costs have been driven up and reached a level which cannot be raised without creating further increases in unemployment, measures of cost limitation (baskets of pharmaceutical products, co-payments for pharmaceutical products, hospital expenses, and treatment at a health resort, a newly introduced doctor's practice fee etc.) have been implemented without any substantial and sustainable influence on the mid- and long-term development of costs. Different budgeting methods for the single medical practitioners as well as a new case-based lump sum compensation system for hospital costs have already failed or will prove to be as inefficient as all the other provisions against future cost explosions.

All the innumerable arrangements to cut health costs have had the same cause of defect: the measures were directed against single erroneous trends without taking into consideration the systemic shortcomings of the traditional Bismarckian social health insurance schemes.[2] Therefore the actors within that complex system of quasi-markets, group negotiations and political lobbying have always been able to adapt to the new terms and conditions very quickly, thus exploiting the persisting systemic failure by more and more complex strategic behaviour. The vicious circle in between partial reforms, cost reduction and adaptations of behaviour as consequence of learning by doing is rotating faster and faster. Consequently the trust of the citizen into the political competency for an efficient steering of the public health system is increasingly eroded, thus generating a strongly decreasing acceptance for further partial reform steps. The voter's anger is then directed against the politicians who are obviously unable to implement appropriate solutions, often provoking the political opponents to popular formulas, which often lead to further obstacles against necessary fundamental changes.

Only a comprehensive systemic approach will shed light on the fundamental causes for the excessive cost development within the social health care and insurance systems.[3] Without doubt health goods and services are superior (and overwhelmingly private) goods, and the demand for such services is more than proportionally increasing in the process of general economic growth, so that a certain degree of cost increases are almost natural consequences. What has to be reduced is just the inefficient excessive demand and supply, which is created

[1] For more details see *Henke* (2003).
[2] The Bismarckian system is described in detail in *Petersen* (1989); for the systematic shortcomings see *Petersen* (1997).
[3] A systematic reform approach for the whole social security sector has been developed in a joint project with the Finance Academy at the Russian Federation supported by the World Bank; for more details see *Petersen* (forthcoming). In this research project a blue print for an efficiency orientated integrated tax and transfer reform in transition countries has been presented.

by the systematic failures within the existing systems. If these systematic failures could be removed, the health sector would play an important role in a modern economic setting and create new jobs, which are currently badly missing to overcome the unemployment situation in many countries. Therefore in chapter II. an actor orientated approach is presented, which is based on the markets involved in the demand and supply processes of the health system. Chapter III. confronts a fully private insurance scheme with the Bismarckian approach of a social health insurance, which is still dominating in Germany. This comparison will make obvious all the misallocations and malpractices, which are discussed in detail in chapter IV. Chapter V. will concentrate on the interplay of public and private health insurance, whilst in chapter VI. the results are concisely summarized.

II. Actors, Markets and Interest Groups in Health Services

In a purely private setting and sufficiently developed market systems there are several markets for health goods and services, which are more or less functioning. Because of the large numbers of actors engaged within the health sector the market structures are comparatively complex.[4] The basic market is the market for outpatients treatments (◊), where the patients are demanders and the medical practitioners and consultants (medical specialists) are the suppliers of medical services (see chart 1). The latter do profit from asymmetric information (or information advantages),[5] which explains a certain market failure. Due to increasing knowledge and experience on the advantages of risk sharing within an insurance membership, private insurance markets are emerging (◊), in which private health insurance companies are offering and selling different insurance contracts to protect the assured persons or insurees (who all are potential patients of the doctors or other suppliers of health goods and services) against individually unbearable risk costs.[6]

Chart 1: Market Structures for Health Protection

patients	——	◊	——	medical practitioners, dentists and consultants
assured persons (patients)	——	◊	——	private insurances
patients	——	◊	——	pharmacies
patients	——	◊	——	hospitals
pharmacies	——	◊	——	pharmaceutical industries

In addition to the markets discussed above at least three more markets (◊) do exist in which different health goods and services are traded. In the third market the potential patients can buy pharmaceutical products, which are partly available on doctor's prescription only. Therefore the demand is to a more or less large extent dependent on the decisions of the medical

[4] This is especially true if health protection is compared to old age security; see, e.g., *Petersen* (forthcoming).
[5] For the role of institutional economics and public choice within the health sector see *Petersen/Müller* (1999).
[6] In case of sickness two possible risk emerge: (1) loss of income from labour und (2) additional expenses connected with the sickness. In the following the stress is laid upon the problem of the benefits in kind and not on income losses. Both risks can be separately insured within the existing private health insurances.

practitioners etc. The market for hospital treatment also partly depends on the doctors decision because except in case of emergency the patients usually are consulting a general practitioner or medical specialist before they are taken into hospital. The last market which is taken into consideration is the market for pharmaceutical products where the pharmacies are the demanders and the pharmaceutical industries the suppliers. Like the basic markets in reality all the markets involved in health protection do have at least partial market failure, which in the past has been the main reason to substitute private markets by political group negotiation systems (see chapter III.).

For generations of politicians and practitioners involved in health policy market failures have been made responsible for social injustice connected with such a system because their main target has always been the classless provision of all citizen with "the necessary" health goods and services (as far as possible at the highest level). At a comparatively low level of technical progress in the medical sector, the *abolishment of the rationing function of the markets* involved could be born by growing populations and real income growth. But the abolition of the scarcity condition in one economic sector has become more and more unbearable in view of decreasing and ageing populations, the slow down in real income growth in the highly developed industrial countries and the rapid technical progress made in the health sector. The political illusions that almost every demand for health goods and services should be financed by the whole society have induced behavioural adaptations on side of demanders and suppliers and created an *entitlement attitude* with harmful consequences for the costs development.

In the contrary, *political rationing* has impaired the trust in the social health care and insurance systems so that parallel private markets have emerged especially since the end of the 60s in the last century, which have made the target of *classless provision a pure political illusion*; even with regard to health goods and services in all countries the demand clearly depends on the individual income situation within the single households as it is the case for all other consumption goods. The lack of market rationing (which would have functioned even by a more or less efficient price system) has been answered by different methods of politically planned rationing methods mentioned above, which overwhelmingly have been without positive impacts of the further cost developments. Therefore this excessive and unrealistic target of the past has to be substituted by a new one: *basic provision of health goods and services* on a level, which is sustainable for the future, and provides the medical necessary goods and services in accordance with the standards of living within the single societies.

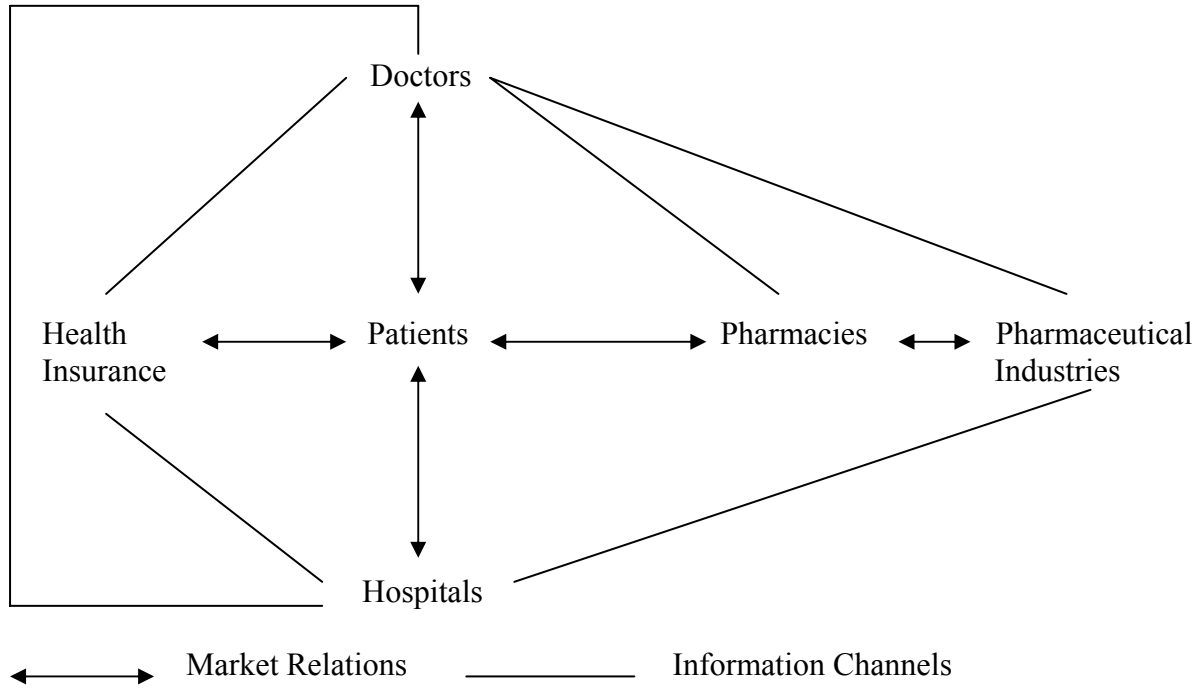
Within the *private health insurance* schemes *standard insurance packages* have been developed, which clearly define the insurance benefits for income loss, outpatients medical treatment (separated for home or family doctors, medical specialists and dental surgeons), pharmaceutical products (in form of positive lists), and hospital treatment. In individual contracts[7] *full coverage* and different amount of *co-payments* can be arranged, which do have an obvious impact on the health insurance premium. In case of not claiming any insurance benefits the insurees are reimbursed in between 30 to 50 % of their annual insurance premium, whilst all medical costs have to be paid at first be the insuree before he gets reimbursed by his insurance. Consequently the patients do have *full information of the volume, quality and the costs of medical goods and services*. The individual insurance premium for a single male person and full coverage – dependent on the individual risk situation of the insuree – is around 200

[7] In contrary to the social health insurance in Germany, which co-insures contribution free the family members, in private health insurances each individual family member has to sign an own insurance contract, so that the redistribution in between single and families and men to women does not occur.

EUR a month, which is clearly below the social health contribution in the middle and upper wage scale.[8]

In chart 2 the market relations of chart 1 are represented as arrows, whilst the information channels and mutual influences are drawn as simple lines. Between health insurances, practitioners, dental surgeons, consultants, pharmacists, hospitals, and the pharmaceutical industries *complex networks* of different relations do exist which makes health protection to a multi dimensional organisational problem. The kind, number and intensity of relations are determined by the details of the single health protection system and – as already mentioned above – often quasi markets or political negotiations substitute even all market elements.[9] For the patients the health system – if privately organized or fully socialized – is depicted as a complex organisational structure, whereas the intransparency of the system is further strengthened by the *asymmetric information*, which favours the suppliers in the markets for health goods and services.[10]

Chart 2: Market Relations and Information Channels in Health Protection



[8] If a self-coverage is agreed, the monthly premium is much less depending on the chosen amount; at 600 EUR annual self-coverage the premium is about 130 EUR monthly. For the standard contract and other conditions see, e.g., Hallesche Krankenversicherung auf Gegenseitigkeit: http://www.al-h.de/. The social health insurance contribution in Germany depends on the individual wage. In an average public insurance the premium is 14 %; at the contribution limit of 4.350 EUR monthly in 2004 the maximum contribution is currently 609 EUR per month, one half paid by the employee and employer.

[9] For more detail see *Scheffler* (1997) and *Petersen* (1997).

[10] Because of the information advantages of the supply side in health economics it is often mentioned that Say's theorem holds true, which states that every supply creates its own demand. Consequently the flux of health goods and services heavily depends on the decisions of the suppliers with far reaching consequences for the cost development.

The demand and supply of health goods and services often comes along with *serious ethical questions*. The political standard argumentation is that due to disturbed preferences people systematically under-demand health goods and services or the health insurance itself so that state interventions are clearly justified. This *merit argumentation*[11] is often accompanied by arguments of *relative poverty* so that people cannot afford to pay an appropriate insurance premium. While the latter argument has obviously lost in relevance since the introduction of the Bismarckian insurance scheme about 125 years ago, the former argument is today contradicted by the fact that within the existing social insurance schemes an ever and ever increasing number of insurees demonstrates an obvious over-demand for health goods and services, being one of the most important causes for the excessive cost developments. And this over-demand is economically rational: if the price and the connected rationing mechanism of the market system is abolished it becomes individually efficient to demand from the system as much as possible, while the costs of the *moral hazard behaviour* are distributed to all – especially the well behaving – insurance members.[12]

While in a private insurance setting decisions on the coverage and therefore the rationing of health goods and services are made by the assured persons due to their *individual preferences*, the abolishment of the market mechanisms necessitates a political decision on the coverage extent of the social health insurance system. Sensitive individual decisions on ethical questions are consequently passing into *collective evaluation mechanisms*, which – due to heterogeneous preferences of the people – often do not lead to clear majority solutions. Therefore the *political resistance against any changes* is enormous and often connected with serious losses in popularity. Hence, principally necessary adaptations are shifted into the future so that the coming generations are cumulatively burdened with the failures of the past.[13]

In a Beveridgean health care system like in the UK almost all the suppliers in chart 1 and 2 are socialized within the state sector. Because such a system principally produces long waiting queus due to political rationing decisions on cost intensive surgery, in the social health insurance systems the contributions have been permanently increased before rationing was implemented. In a formal sense within the social insurance scheme doctors and pharmacists as well as the pharmaceutical industries are private, while the social health insurance and the hospitals are predominantly part of the public sector. In any case the price mechanism has been substituted by a *publicly steered mechanism of cost coverage*, with overwhelmingly fatal consequences not only for economic efficiency but also for equality of opportunity.

Partial market failures (disturb preferences on side of the assured, asymmetric information on side of the suppliers, oligopolistical structures with in some markets and local monopolies due to advantages of scale and scope) have been used as justifying causes for a more or less complete socialisation of the health sector. But due to different forms of market failure and the insecurity of the insurance funds in case of unregulated insurance markets, political decisions in the past were often made against markets and in favour of state intervention. A whole theory of *private insurance failure* has been developed, which consist of problems of relative poverty, adverse selection, moral hazard, risk infection, long term insecurity of private funds etc.[14] While in private systems at least a certain insecurity of insurance funds necessitates state regulation, but never can exclude all capital risks, in social insurance and care systems strong *interest groups* emerge, using their collective power for *rent seeking* purposes, thus

[11] For the problems of merit goods see *Petersen* (1993, pp. 144) and health as merit good *Petersen* (1989, pp. 140).
[12] For a description of moral hazard see *Petersen* (1989) and *Petersen/Müller* (1999, pp. 65).
[13] For details on the public choice approach to tax and transfer reforms see *Petersen* (2000).
[14] For details see *Schönbäck* (1980) und *Petersen* (1989).

more and more exploiting the public systems. Doctors, dentists and pharmacists associations, organisations of the pharmaceutical industries and the public hospitals have been developed, which all are involved as interest groups in producing the costs to be born by the public. The insiders of the system do have much better information than the politicians as outsiders so that cost pressures are a built-in phenomenon. Hence, the *political risks* of public steered systems today are to be evaluated much higher than capital risks which might be involved within private insurance schemes. For decades it has been politically neglected in the traditional social policy that social insurance systems as well as care systems are confronted with just the same problems as discussed for private schemes or even worse: the problems are more serious creating structural deficits which make the systems unsustainable.

III. Private and Social Health Insurance in a Simple Model

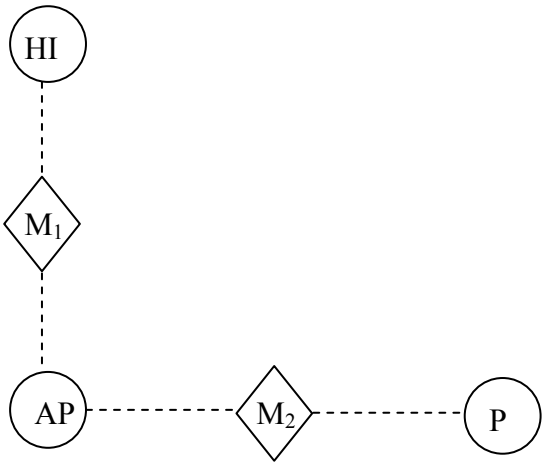
With regard to the health protection system not only precautions for a possible income loss have to be made but also additional expenses for health goods and services have to be financed. In a private health insurance setting as mentioned above an individual health insurance contract would determine the possible reimbursement of the assured person for such health expenses. Then the individual person has chosen a certain coverage (full or partial) that is in accordance with an equivalent actuarially fair insurance premium. The level of the benefit in kind corresponds to the individual preferences.

In social health insurance and care systems the level of the benefits in kind secured by the social health protection system has to be determined by political decisions. While in the first phases of the social health protection systems a full coverage on an optimal level was striven for, the misconstructions within the systems as well as the permanent expenditure pressure have forced social politicians to several reforms in which the full coverage was stepwise reduced. These reductions have often met the resistance of the beneficiaries as well as of the interest groups being involved (associations of physicians, pharmacist, pharmaceutical industry etc.). Therefore, the necessary reform process is getting along only in a very draggling way.

What are the main misconstructions within the health protection system? The comparison of a private health insurance with the basics features of the German health insurance can shed some light on the main problems. Chart 3 and 4 contrast cum grano salis a private health insurance as a market system with the current regulatory mechanism in place for social health insurance, whereby, for the sake of simplicity, the above mentioned interrelated markets (see chart 1 and 2) are neglected.[15]

[15] The most important source for such presentations is *Herder-Dorneich* (1980).

Chart 3: Private Health Insurance as a Market System



Source: Herder-Dorneich (1980, p. 37).

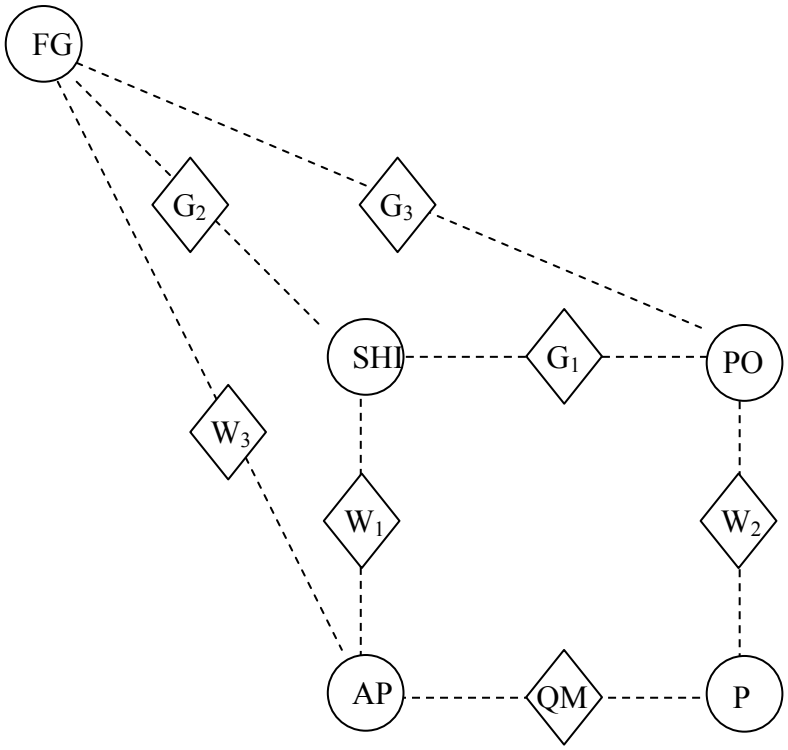
In the model of private health insurance we have three bargainers: the assured person (or patient), AP, as demander of health goods and services (here: outpatient physicians' services[16]), the physicians (or practitioner), P, as supplier of health goods and the health insurance companies, HI, as supplier of health insurance policies (cost coverage). Two markets connect these bargainers: market 1, M_1, for insurance services, and market 2, M_2, for health services. Without going into detail[17], it should be noted that the assured person, AP, directly demands health services from the physician, P, and pays in real market prices. The receipts, which the assured person obtains from the physician, comprise the quantity and quality of health services as well as the single prices. Consequently the assured person has full information on the services and the connected costs.[18] The assured person then passes on the receipt to his health insurance, HI, which reimburses the assured. Hence, the assured persons have the full sovereignty of consumption with regard to the choice of insurances and the physicians, and they have full information on prices and services, so that a clear cost consciousness does exist.

In comparison with the model of social health insurance (see chart 4), two other (groups of) bargainers are added: First, the physicians' organisation (or association), PO, is an institution which is responsible for the distribution of the total amount of insurance revenue[19] provided by the social health insurance, SHI, for physicians' services to the individual physician. Second, the federal government social politicians, FG, who have the main responsibility for the insurance coverage as well as the budgets. In addition, the market relations within the private insurance model are replaced by electoral systems, $V_1 - V_3$, and a medical card (or voucher) system (often called quasi market, QM), which is the entrance key to the health services. The

[16] In private health insurances the insurance contracts are predominantly separated in four kinds of health goods and services: 1. Outpatient physicians' services, 2. dental treatment, 3. hospital expenses, and 4. the replacement income in case of sickness. In these entire contract details different levels of coverage can be agreed upon dependent on the individual risk preferences of the assured person.
[17] See *Petersen* (1989, pp. 142).
[18] Information on the quality of health services can be derived if the doctors would be evaluated by patients, insurances or independent organisations; in the current systems such evaluations are predominantly non existing.
[19] Simply expressed the total revenue results as average social health insurance contribution multiplied with the number of assured persons within the single insurance.

term quasi market is somewhat misleading because neither information on medical services nor on the costs of services are given to the assured persons. It is rather a voucher or purchase permit system which on the part of the assured creates the illusion that health services are zero priced – with all the well-known negative consequences for allocation. Furthermore the assured persons do not get any information about the quantity and quality of health services generated by the physicians, so that a real control mechanism of the physicians' supply is badly missing. Consequently the billing fraud is becoming a frequent problem. In case of such a misconstruction the differences between a Bismarckian insurance scheme and the Beveridgean health care system diminish in the course of time and both systems become more and more inefficient.

Chart 4: Steering Mechanism of a Social Health Insurance



Source: Herder-Dorneich (1980, p. 35).

As consequence of the increased number of bargainers, the network of relationships between them becomes much more complex. The insurance market, M_1, is replaced by the election of membership representatives[20] to the health insurance, V_1, and an electoral process, V_2, is also implemented between the physicians, P, and the physicians' organisation, PO. The relation between the social health insurance, SHI, and the physicians' organisation, PO, is regulated by group negotiations, N_1, and corresponding group negotiations, N_2, take place between the federal government, FG, and the social health insurance, SHI. The general elections for the federal parliament, V_3, are an expression of the relation between the federal government, FG, and the assured persons (or voters), AP. Last but not least the group negotiations, N_3, between the federal government, FG, and the physicians' organisation, PO, have to be mentioned.

[20] The employees (via the trade unions) and the employers both have 50 % of the representatives within the social insurance system.

With regard to *public choice* theory, all bargainers have massive *self-interests*, which impair, at least partially, the overall efficiency of a market economy. Because the assured continue, as a result of their strategy to maximize individual utility, to obtain high-quality medical services at the most favourable insurance premium, and because there is a lack of information on the services supplied by the physicians and the corresponding costs, *cost consciousness is inevitably reduced*. Since the medical card system creates false information and illusions, the propensity to moral hazard behaviour is increased. In comparison with a private insurance system that consists of several competing private health insurances perhaps in an oligopolistical structure, a mandatory health insurance system covers a much larger membership. Because the costs of moral hazard are distributed among all members, at least in the beginning, the per capita costs of moral hazard for the individual member in the social insurance system is lower than in a smaller private health insurance. Hence, the possible individual profit is high; the individual cost-benefit analysis demonstrates that moral hazard is profitable as long as it does not become a general phenomenon.

Therefore, to rely solely on quasi markets or on the introduction of some market elements into the social insurance system might currently be the only feasible strategy, but it remains a strategy of curing symptoms. It is quiet obvious that political group negotiations are instruments, which may be popular with social scientists, but what is created instead of the alleged market failures of private insurance markets are *political failures, governmental failures, electoral paradoxes, bureaucratic failures, etc.* Causal therapy would involve strengthening the insurance markets by providing efficient regulation and by subsidising the insured individuals who would otherwise be hit by adverse selection because of a bad personal risk structure. The latter problem is an important task of a socially orientated market economy that directs its support to the really poor within the societies.

In practice pure market systems as described by chart 1 do not exist. Since some decades in almost all countries the private insurance schemes are more or less efficiently regulated.[21] The regulations range from *competition control* via cost and *price control* to insurance *funds security* and *funds policies*. For several insurance branches *reinsurance programmes* have been implemented to assure the funds of the insurees against the bankruptcy of single insurances. All these measures have contributed to a strongly increasing safeness of mature private insurance schemes so that today the security situation of the private scheme often seems to be much more promising than of the public ones, the latter especially threatened by the gloomy demographical prospects.

IV. Misallocation and Malpractice in Social Health Care and Insurances

In the following chapter the current malaise within the health service systems of two countries will be shortly summarized. The UK is chosen as example for an inefficient care system, while Germany presents the problems within an inefficient social health insurance. The chapter closes with some remarks on the intertemporal problems also involved in health economics.

[21] In Germany the insurance control has been recently merged with the bank control within one institution, the *Bundesanstalt für Finanzdienstaufsicht*; for details on the historical development of banking and insurance control see http://www.bafin.de (Wir über uns: Geschichte).

IV.1. The UK Health Care System

The Beveridgean type of social protection has grown out of the poor relief, which was exemplified in the early pension legislation of Britain (1908).[22] Today a comprehensive state administered social protection system covers almost the entire population. While the care components are mainly tax financed, the social insurance components are financed from contributions, which partly allow for income-related benefits.[23] The National Insurance Fund (NIF) is the core institution of the social insurance system, which is financed by compulsory contributions based on current income and paid by most workers and employers.[24] The system covers the pension insurance, unemployment insurance, accidents insurance as well as sickness and maternity benefits. The contributions raised by the NIF are distributed on the single insurance branches. Additionally the NIF receives a public grant from the budget, which is about 10 to 15 % of the total expenses.[25]

The NIF contributions are paid as part of the income tax, following the pay as you earn approach (withdrawal or source tax). In case of the existence of occupational pension schemes, only reduced contributions to the NIF are paid (so-called contracting-out). For private old age protection, the total NIF contributions apply. The NIF then transfers the contributions, which are above the reduced contributions to the private pension insurance. For the NIF contributions four different contribution classes exist (see chart 5).

Chart 5: Contribution Classes for the NIF

Contribution Class		Description
Class 1	-	Paid by people who work as employed earners and their employers
Class 2	-	Paid by people who are self-employed
Class 3	-	Voluntary contribution by people who wish to protect their entitlement to the state pension and do not pay enough national insurance contributions in another class
Class 4	-	Paid by those whose profits and gains are chargeable to income tax. These are normally paid by self-employed people in addition to Class 2 contributions

Source: Inland Revenue (2003, p. 2).

In class 1 the British "standard" employee is assured. Above the income threshold the employers' contribution rate is 12.8 % and the employees rate 11 % of the earned wage (see chart 6). For contracted-out workers the employers contribution is reduced to 9.3 %. Below the threshold no contributions are raised and the employer is not assured. For wages in the range of the lower limit (5,805.80 Euro)[26] and the threshold (6,691.75 Euro) contributions are still zero, but an assurance does exist; the contributions for the self-employed are also represented in chart 6.

[22] Before similar models were introduced in Scandinavia, e.g., in Denmark 1891. See for more details *Baldwin* (1997, pp. 4).
[23] See *Europäische Kommission – Beschäftigung und Soziales – Missoc* (2002) under http://europa.eu.int/comm/employment_social/missoc/2002/org_de.pdf.
[24] See *Schmidt* (2002, p. 166).
[25] See *Inland Revenue* (2003, p. 48).
[26] The amounts have been converted from GBP to Euro with an exchange rate 1 GBP = 1.45 Euro.

Chart 6: NIF Contributions and Assessment Limits

Class	Contributions		Assessment Limits
	Employees	**Employers**	
Class 1	- Wage below threshold: no contributions - Wage above threshold: **12.8 %** (Contracted-out: **9.3 %**)	- Wage below lower limit: **no insurance** - Wage between lower limit and threshold: **0 %** (but assured) - Wage between threshold and upper limit: **11 %** (Contracted-out: **9.4 %**) - Wage above the upper limit: **1 %**	- Lower limit: **5,805.80** €/ year - Threshold: **6,691.75** €/ year - Upper limit**:** **44,863.00** € / year
Class 2	- Lump sum contribution (2002): **2.90 € / week**		Negligible income limit: 5,836.25 €/ year
Class 3	- Lump sum contribution (2002): **9.93 € / week**		No limit, volutary contribution
Class 4	- **8 % of profits** above the lower and below the upper limit - **1 % of profits** above upper limit		Lower limit: 6,691.75 €/ year Upper limit: 44,863.00 € /year

Source: Inland Revenue (2003, pp. 7 and 2003 a, pp.13) and Adams/Kaplan (2002, pp. 9).

Non-contributory benefits and transfers in kind are financed from the general tax revenue and dependent on specific personal circumstances. The National Health Service (NHS) provides universal health care, which is financed form tax revenue and the NIF. Because the whole social insurance (NIF) is financed by an overall contribution, a separation on the single branches is not possible.

The UK health protection system is a tax financed public health care system in which all the UK residence participate. Even the supply side (practitioners, consultants, pharmacists, hospitals, etc.) is part of the public sector,[27] so that the remaining quasi-markets within the social health insurance approach (see chart 1 and the surrounding text above) are abolished. In contrary to the transfers in kind, which are covered by the National Health System (NHS), the cash benefits (sickness benefits, maternity benefits, and benefits in case of occupational diseases) are born by the National Insurance Funds (NIF).[28] The private health insurance system is limited to upgrade insurance. Because of increasing *waiting times and queues* especially for high quality medical treatment, *private upgrade insurances* have become more popular; in 1996 about 9 % of the UK population were assured in an private upgrade health insurance.[29]

The remunerations for the doctors are negotiated between the government and representatives from the doctors associations; the NHS administers the public hospitals. The expenses for medical services are financed by the general tax revenue (about 80 %); the remaining 20 % are mainly financed by the NIF. Principally the choice of the home doctor is free but the doctor himself has to agree; the home doctor is the key-person who regulates the access to the consultants as well as to the hospitals. The medical treatment of doctors and within the hospi-

[27] Since 1998 experiments with alternative models are made, in which personal medical services (PMS) are supplied on the base of local contracts between Local Health Authorities and licensed doctors. For details see *Europäische Kommission – Beschäftigung und Soziales – Missoc* (2002) under http://europa.eu.int/comm/employment_social/missoc/2002/uk_part2_de.htm.

[28] For more details see *Petersen* (forthcoming).

[29] See *Jakubowski/Busse* (1999, p. 122).

tals is without any personal co-financing. For dental treatment of the General Dental Service a co-financing does exist. The NHS covers 80 % of a course of dental treatment expenses up to 522 Euro. For pharmaceuticals the co-financing is 8.85 Euro for each prescribed item.[30]

The sickness cash benefits are partly paid by the NIF. The Short-term Incapacity Benefit (IB) applies for self-employed and unemployed people. For employees only the Statutory Sick Pay (SSP) applies if they have reached the lower earning limit of the NIF. Before sickness benefits are paid, there is a waiting period of three days. The SSP is paid by the employer in case of illness lasting at least 4 consecutive days up to a maximum of 28 weeks. The standard rate is 90.19 Euro per week (or about 390.83 Euro per month). The IB and family additions are financed by the NIF. The IB is paid in two rates: the lower rate of 76.26 Euro per week applies for first 28 weeks; the higher rate of 90.19 Euro applies thereafter. If the person is over pension age, the weekly amount is 101.14 Euro per week. For spouses over the age of 60 or adult caring for dependant children the additional benefit is 47.20 Euro per week, for the first child 14.07 Euro and for each other 15.89 Euro.[31] The sort-term IB applies for 52 weeks maximum; then it is replaced by a long-term incapacity benefit. All these benefits are due to the income tax.

Compared to the much more generous social health insurance cash benefits in Germany[32] and other European countries,[33] the *British system is obviously basic security orientated*. Due to the high co-financing of pharmaceutical items, the waiting period of three days until the SSP und IB are paid, and the comparatively low sickness benefits, the UK population is obviously much less pampered by the social network and has therefore much stronger incentives for protection measures to be decided on in primary responsibility. In view of the poor protection levels and partly enormous queues for high quality medical treatment, the system still finds acceptance, obviously because from the very beginning it has *promised less than many social insurance schemes did*. However, discussions on the reform of the NHS are highly on the agenda.

IV.2. The German Social Health Insurance System

The social health insurance system is not a unitary institution but consists of local, companies, guilds, agricultural, professional, etc. insurances and the so-called compensation cashes, which are self-administrative entities of public law (like all the social insurances). Since some years the number of the existing insurances decreased to 420 in the year 2000 (see table 1). The membership is compulsory for all blue-collar workers and for white-collar workers with a wage below the income limit for the legal obligation to insure (see table 2). Above that limit employees are free to choose self-coverage of health risks or to assure within private health insurances. Self-employed and employees above the income limit can be voluntarily insured in one of the above mentioned insurance types while some special prerequisites apply. Since recently the compulsory members are free to choose their preferred insurance from the basket of the existing mandatory health insurances, so that a certain since 1996 *competition between the mandatory health insurances has been introduced*.

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[30] An annual (or 4 months) prescription prepayment certificate can be bought which offers considerable savings to those who need regular medication. The cost of the certificate is 46.26 Euro for 4 months and 127.02 Euro for one year. For further details see *Europäische Kommission – Beschäftigung und Soziales – Missoc* (2002) under http://europa.eu.int/comm/employment_social/missoc/2002/uk_part2_de.htm.

[31] See ibid.

[32] The German sickness benefit, paid for the first six weeks by the employers, is 100 % of the last wage before sickness; the expenses of the employers are 4 to 6 % of the payroll.

[33] In *Petersen* (forthcoming) a comparison for four European countries is presented.

Table 1: Social Health Insurance

Specification	Unit	1998	1999	2000
Single insurances	Number	483	459	420
Members (incl. pensioners) [1]	1 000	50 686	50 927	51 036
Receipts [2]	EUR mn	127 750	131 203	133 808
Expenditure [2]	EUR mn	127 473	130 918	133 740

[1] Average of 12 monthly values.
[2] Excl. risk structure compensation scheme.

Source: Statistisches Bundesamt (2002)

Table 2: Overview on the Basic Parameters of the Social Insurance Scheme 2003

Income limit for the legal obligation to insure

Health insurance	Old States	New States
Year	45,900.00 Euro	45,900.00 Euro
Month	3,825.00 Euro	3,825.00 Euro
Day	127.50 Euro	127.50 Euro

Contribution assessment limit

Health and old age care insurance	Old States	New States
Year	41,400.00 Euro	41,400.00 Euro
Month	3,450.00 Euro	3,450.00 Euro
Day	115.00 Euro	115.00 Euro
Pension and unemployment insurance	Old States	New States
Year	61,200.00 Euro	51,000.00 Euro
Month	5,100.00 Euro	4,250.00 Euro
Day	170.00 Euro	141.67 Euro

Contribution rates

	Old States	New States
Branches of social insurance		
Pension insurance	19.5 %	19.5 %
Health insurance	11.9 % to 15.7 %	11.9 % to 15.3 %
Old age care insurance	1.7 %	1.7 %
Unemployment insurance	6.5 %	6.5 %
Students contributions		
Health insurance	45.67 Euro	45.67 Euro
Old age care insurance	7.92 Euro	7.92 Euro

Wage limit for negligible part-time employment

Month	325.00 Euro	325.00 Euro

Source: Bundesministerium für Wirtschaft und Soziales (2003).

Compared to the social pension insurance, the large number of much smaller social health insurances creates an *adverse selection problem* for the single insurances because in some of

them bad risk case are concentrated. With the purpose to avoid negative consequences for single insurances, risk sharing or equalisation schemes have been implemented (*risk structure compensation scheme*).

The single social health insurances have due to their different risk structure different costs, which are also expressed in *different contribution rates*. The actual contribution rates are in the range from 11.9 % for the most favourable and 15.7 % in the most expensive insurance (see table 2).[34] These contribution rates are applied until the contribution assessment limit is reached, which is 75 % of the social pension insurance contribution assessment limit. The maximum contribution is then between 4,926.60 Euro in the most favourable and 6,499,80 Euro in the most expensive social health insurance. *Non-working family members (spouse and children) are contribution-free insured*.[35] As in case of the social pension insurance contribution, the employee and employer pay half of the contribution, respectively. Principally the single insurances have to balance their budgets by contribution adaptations in due time. Therefore contribution revenue (receipts) and expenditure are almost balanced (see table 1).

The benefits from the social health insurance are mainly medical services (transfers in kind) and sickness benefits. Law independently from the actually paid contribution defines about 95 % of all medical services. The comprehensive catalogue comprises all necessary medical treatment from ambulant treatment of physicians and dentists to hospital treatment on a comparatively high level.[36] With different cost abatement laws co-payments for the assured were introduced. For pharmaceuticals, hospital treatment and especially for dental treatment (dental prosthesis) as well as eyeglasses the co-payments are partly defined in absolute and partly in relative terms.[37] But generally the patients do not get any information about the quantity and quality of medical treatment they have demanded, abstained from any price or cost information (see chart 1 and the surrounding text above).

People in old age who were in need of care were only very limited assured in the social health insurance and often got into the social aid system due to the high care costs. Therefore in 1995 old age care insurance was invented and implemented as a mandatory system for all citizen older than 18 years. Even the self-employed and government officials are compulsory members. Therefore, this social insurance scheme has with 71,3 million members in 2000 the largest number of persons insured of all existing social insurance systems (see table 3). Citizen with income above the limit for the legal obligation to insure have to procure an old age care insurance contract with their private health insurance.

Table 3: Social Old Age Care Insurance

Specification	**Unit**	**1998**	**1999**	**2000**
Number of persons insured	1 000	71 458	71 545	71 319
Recipients of benefits	1 000	1 738	1 819	1 822
- domiciliary care	1 000	1 227	1 275	1 261
- residential care	1 000	511	544	561
Receipts	EUR mn	16 083	16 318	16 543
Expenditure	EUR mn	15 823	16 352	16 674

Source: Statistisches Bundesamt (2002)

[34] The actual contribution rates are to be found under http://www.abc-der-krankenkassen.de/template.php3?page=alphabetinc.php3&id=1.
[35] The income dependency (instead of a risk orientation as in private insurance schemes) and the contribution-free co-insurance of family members are re-distributive measures, which currently are seriously discussed.
[36] For details see http://www.abc-der-krankenkassen.de/gesetzlicheLeistungen.htm.
[37] See http://www.abc-der-krankenkassen.de/zuzahlungen.htm.

The contribution rate in the old age care insurance is constant since 1996 with 1.7 % up to the contribution assessment limit of the social health insurance (see table 2). The maximum annual contribution is 703.80 Euro, again divided between employee and employer. While in the first years the old age care insurance has made a surplus, until recently deficits have been run, so that contribution rate increases as in the social health insurances are likely.

The need of care is defined in detail by the law; different grades of care are differentiated. In the first grade daily care is supported by transfers in kind up to 383.50 Euro or in cash to assisting relatives up to 204.50 Euro per month. In the highest third grade the amounts are 1,431.60 Euro and 664.70 Euro, respectively. Due to the high monthly costs of old age care in nursing homes of often much more than 3,000 Euro per month, even in case of an average pension payment both, the transfer in kind and the pension are not high enough to pay for the nursing costs. Then the maintenance obligation of the relatives becomes effective or in case of poverty the social aid system has to come into effect.

Because a large part of the German population is compulsory assured in the social health insurance system (clearly about 90 %), the assured persons in the *private health insurance* system are overwhelmingly *self-employed and government officials*. The latter do have an own health care system, which principally pays for 50 % of the medical expenses; usually the other 50 % are assured by quota-contracts within the private health insurance system.[38] Naturally the private health insurances have *risk-orientated premiums* for the individual members (differentiated for male and female, age, individual risk situation, age at inception date, etc.) including lifetime individual accounts for the *old age accruals*. In spite of the regulations in other European countries, in case of insurance change the accruals are expired. This regulation interferes the competition between the single health insurances. However, discussions on possible changes in the regulation have begun. The private health insurance market has an oligopolistical structure. The opening with regard to the common European market has strengthened the competition and additionally improved the risk structure within single insurances. As mentioned above, the contract usually consists of four parts: ambulant treatment of physicians, dental treatment, hospital treatment, and replacement income. *All measures to avoid moral hazard are used*. In each part of the contract a certain retained amount can be arranged that reduce the insurance premium. Moreover, premium reimbursement is implemented, which also reduces the premium dependent on the length of the period (number of month or years, partly with progressive reimbursement) in which no benefits have been claimed. In case of high risks additional premiums are applied. The in former times possible debarment in case of high risks is today overwhelmingly avoided because such practices have undermined the trust of the assured into the private insurance scheme.

In Germany the *private health insurance is bound to the price system of the social health system*, thus reflecting the problems and inefficiencies involved in that scheme. The medical services are systematically higher priced as in the social health insurance by a multiplier system, which is dependent on the complicacy of the single medical treatment. In the coming reform of insurance regulation also separate price negotiations between the private insurances and the physicians (or physicians' association) have to be reconsidered.

IV.3. Current Discussions: Intertemporal Perspective and Fundamental Change

Since the health protection is more a problem where cost coverage can predominantly be organised within one period, the PAYGO approach is even appropriate for private insurance

[38] Both can by application also become members of the social health insurance as far as their income is below the limit for the legal obligation to be assured or before they have been employees with mandatory membership.

schemes. But because the health expenditures heavily depend on the age of the assured persons, in the health insurance – like in the pension schemes – an *intertemporal problem of risk sharing* does exist. In a private insurance scheme the increasing costs for the older assured are reflected in a special fund financed from the premiums, which have been paid during the active phases of live. The private health protection is then at least partially protected against increases in live expectancy as long as such increases are projected correctly. In the social health protection systems such an intertemporal mechanism is badly missing, so that the *demographic changes will also have gloomy consequences for social health insurance* as well as care systems. Already in the last two decades in the German example the expenses for retired persons have been increased more than double as strong as the expenses for the general health insurance.[39]

Fundamental changes within the social health protection systems are in the discussion; on the one hand the financing by wage-related contributions has been substituted by *per capita premiums* (as in the case of Switzerland). Consequently such a reform would mitigate the problem of the ancillary wage costs (non-wage labour costs). But without a reform of the expenditure side on the other hand, no clear reduction of the wage extra costs can be reached. A *catalogue of basic health services* must be defined in which the coverage is limited to the really necessary sickness expenses.[40] This catalogue has to be guaranteed to every member of the society. In case of poverty the catalogue has to be supplied in form of transfers in kind, or alternatively, this catalogue is supplied by private health insurances. Then the social aid recipients would get their risk orientated personal insurance premium paid by the social aid system. In case of cost free insurance periods they also would profit from the repayment of premiums so that even in this group a better cost control and incentives for decreasing health expenses are given. For all employed persons the insurance premiums for that basic health care would be income tax free, so that all groups of the society would have the same minimum health care.[41] Additional health services then have to be insured by insurance contracts guaranteeing higher coverage levels.

V. Interplay of Public and Private Health Insurance: Lessons for Countries in Transition

The basic lines and problems of social health protection systems have already been discussed above. Our analysis has made clear that the current social health insurance as well as the health care systems is fundamentally faulty constructed. The only possible reform perspective is causal therapy because curing symptoms has already failed in the past. As far as social health insurance schemes are taken into consideration, only the introduction of market elements could overcome the current malaise of permanent cost explosions. Market elements on the one hand consists of *clear cost signals for the assured* connected with better *control mechanisms of the medical supply*, e.g., detailed information for the assured on the quantity, quality and prices of health goods and services. On the other hand the introduction of market elements have to deliver the *correct incentives* which would steer the assured demand for health goods and services much more efficiently. As far as the institutional setting is taken into consideration, the question has to be answered if all that elements could better be organised within a private insurance scheme, because only in such a scheme a sufficient extent of necessary competition can be secured which is always necessary for price control.

[39] See *Institut der deutschen Wirtschaft* (2003, p. 5).
[40] See, e.g., *Sowada* (2000).
[41] For the integration of the tax and transfer system see *Anton/Brehe/Petersen* (2002), *Petersen/Rose* (2003) und *Petersen* (2003a, 2003b, 2003c, and 2004).

A fundamental and comprehensive health protection reform has to solve two tasks: First such a reform should secure the framework for a long term optimal allocation of public expenditures for health protection; second – and perhaps more important – is the necessary reformulation of the role of the societies solidarity and the role of the state with regard to their responsibilities connected with health protection. Hence, it becomes more and more clear that even the West European countries are unable to guarantee the highest possible quality and quantity of health goods and services in the sense of a sufficient coverage for every citizen with all technical possible, expensive medical services. Demographic change, ageing and the badly lacking incentives for an economically demand for medical services intensify the financial pressures.

The social politicians being interested in re-election overwhelmingly stick to a guaranteed full coverage for every citizen and deny any unequal treatment regarding the access to medical services. Often they almost swear to the classless society with regard to medical services, thus impairing the scarcity conditions which are fundamental for every economic system. If any rationing is refused, there are no chances for the introduction at least of some market elements. If rationing by the price system is rejected, as the real existing socialism has proofed, waiting queues are the outcome, as can be easily observed as consequence of the UK health care system. Then, step-by-step, private parallel markets for health care services emerge in which the unsaturated demand meets a sufficient supply, partly at relatively high costs.[42]

If the rationing mechanism of markets as consequence of the mechanism of relative prices is abolished, the scarcity condition is switched-off in that sector, one and perhaps the main reason for the permanent cost explosions that are only prolonged by curing symptoms instead of causal therapy. The classless society just for one sector is as an illusion as for the whole society. With regard to consumption possibilities for "ordinary" goods and services, the differentiated income class society is at least in market economies accepted since generations, thus creating the necessary incentives for the supply of effort. The emergence of private markets is expression of the consumers' sovereignty, which is obviously suppressed in the social protection systems. The ban of private medical service markets would be a clear offence against a market economy and is a clear interference into the constitutional rights. Even in view of the current discussions in Germany that medical services for a basic coverage should be only supplied by social health insurances,[43] such change would be a clear step backwards to an increased interventionism of the state and even worsen the current situation.

One important argument for a justified and well-dosed state intervention is the general interest of the public on a sufficient state of health and on the existence of satisfying precautions in case of sickness. As important is the individual interests of the citizen with regard to their own health situation. Due to the consumers' sovereignty, the general interest of the public can only justify complementary and accompanying measures of social protection if the individual precautions are not secured in a sufficient way. However, many medical services are indispensable to life. In case of need, any refusal of such services would jeopardise the physical existence of the affected people. Therefore, in the European setting it is out of question that *vital medical services are made available*, independently from the needy individuals ability to pay for such services. The health protection for the persons in need has to been overtaken by the state, following the justice of needs concept (or the solidarity principle).[44]

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[42] In many transformation states, or even already in socialistic times, the health care systems were not able for a sufficient supply of medical services, so that on illicit markets (or below the tables) medical services were traded.

[43] The *Rürup commission* currently discusses such ideas. For the results see http://www.soziale-sicherungssysteme.de/download/index.html.

[44] For a detailed discussin of the concepts of justice of ability and justice of needs see *Petersen* (1993) and *Petersen/Müller* (1999).

In the health protection scheme the justice of needs concept can be expressed in two demands: First the identification of *basic security services* in the medical sphere has to be limited to that services which are indispensable for life. Obviously this identification is connected with ethical reasoning, with individual as well as social norms, and the technically possible medical services. Because even in such an important service sector, *a permanent breach of the general scarcity conditions cannot be accepted without endangering the existence of the whole economic system.* Therefore, the identification of the really necessary medical services is a permanent task for the societal discourse that finally influences the voting behaviour of the citizen. The second demand is connected with the principle of *subsidiarity*, which states that in the very first instance the responsibility even for such basic and important health good and services is with the individual. Society and state should concentrate their care on those who are unable for individual health protection. If free rider behaviour is a frequent and individuals who are principally able for protection in self-responsibility do not care, a *mandatory obligation for health protection could be legitimate*.[45]

The identification of the basic catalogue of the medical goods and services is a complex task that can be only solved by politicians, physicians and economists in an interdisciplinary approach, e.g., done in official ethical commissions. The volume and structure of such a catalogue has to be permanently adapted to the technical standards as well as to the economic possibilities. In that identification process the highest possible extent of transparency should be striven for. Economics and health economics have developed a real bundle of criteria, which allow a classification in basic and upgraded health services.[46] Here the criteria of the medical exigency, the medical effectiveness, and the cost criteria are just to be mentioned.

Principally the individual insurance approach is the most comfortable alternative for social market economies, even if most of the existing health insurance systems follow – due to the above-mentioned historical reasons – quite another approach. The premiums are fully orientated to the individual risk. Changes in the risk situation have then consequences for the future premiums. The intertemporal risk sharing necessitates individual funds for the old-age, which should be clearly defined and transformed to a competitive insurance in case that the assured will change into another insurance.[47] The problem of *adverse selection*, which does exist in all insurance schemes, can be easily solved by a *subsidisation of the part of the premium*, which is above the standard risk for disabled people, and in case of poverty the full premium could be transferred as mentioned above. Poverty and disability are clearly defined facts while only in case of psychological diseases some problems of identification remain, which are also creating problems within the current institutional settings. Hence, an efficiently regulated private health insurance scheme with a basic insurance and a upgrade insurance is able to overcome all the limitations of private insurance schemes mentioned above if the problems of relative poverty and adverse selection are solved by premium grants for the concerned groups of assured persons.

Naturally such a health protection reform needs a certain trust in the regulative powers of the government as well as in the efficiency and justice of the connected market solutions. Even in the Western European countries often such trust is badly missing – in spite of the obvious failures of the existing systems. Whether the introduction of a private health insurance system

[45] But one should be fully aware that alleged free rider behaviour is often a pure interest group argument to press the whole population into mandatory systems because only a comprehensive system secures solidarity. Comprehensive, monopolised systems mean on the one hand the largest possible political impact for the lobbyists, and on the other hand the necessity of permanent political interventions from the social politicians. Both impacts are overwhelmingly counterproductive; for details see *Petersen* (2000).

[46] See, e.g., *Sowada* (2000, pp. 55).

[47] In Germany these funds are lost in case of an insurance change that creates a trap against any change and impairs the competition between the insurances.

would be the silver bullet in the direction of a social market economy, for a transition period even a social insurance scheme might be a system which is only political feasible. This is especially true if the change form a publicly administrated care system has to be organised.[48] But if such an interims solution is striven for, *the decisive elements of a well indicated catalogue of basic health services as well as the necessary steering mechanisms for the demand of health services and the control of the supply side have to be integrated into such a model*. Then the future switch to a private scheme would be far easier because the basic market elements have already been integrated with the interim reform step.

Beside the health insurance problem, a specific problem of old-age care has been identified in Germany during the mid 90s of the last century. The answer has been a new social insurance scheme: the old-age care insurance as mentioned above. Principally the old-age care problem would not have been a problem at all if the social health insurance scheme would follow the funding approach for the old-age people as it is in the case of private health insurance. The old-age care insurance therefore is the consequence of a falsely constructed social health insurance, so that in an efficient private setting there is no pride of place for such an insurance branch.

VI. Summary: The Necessary Steps to a Fundamental Reform

Summarizing all arguments in a nutshell, the clear diagnosis is: *the social health care and insurance schemes are sick of too much political intervention and heavily infected by interest group influence*. These fundamental failures can only be overcome if the cobweb of supply-dominated influences and lobbying of the involved association is substantially pushed back. The design of a modern mix of public and private health insurances has to be so efficient that permanent political interventions become redundant. In the German case that would mean fundamental reforms within the private insurance schemes as well as within the social health insurance system.

Private Health Insurance:

- More *efficient regulation* of the insurance system by independent control of costs and premiums (like in case of the audit courts).
- *Transfer of old age accruals* in case of insurance change from the old to the new health insurance to strengthen the systems competition.
- *Reinsurance* of the funds for the old age accruals to limit capital risks.
- *Segregation of the negotiations* on medical fees and hospital expenses of the private health insurances from the collective bargaining process of the social health insurance system.
- *Direct contracts* in between the private health insurances, the doctors (physicians) and the hospitals.
- *Quality inspections* by the private health insurances for doctor's and hospital's performance including a free information policy.
- *Abolishment of competitive restrictions* for doctors and hospitals.

[48] In the Polish example a social health insurance has been introduced; for details see *Sowada* (2000). Because of similar constructive failures as in the Germany this system has recently come under enormous pressures.

Social Health Insurance:

- Combating the asymmetric information in favour of the supply side by giving clear *information of medical attendance* and the *costs of medical treatment and pharmaceutical products* to the patients.
- Combating moral hazard behaviour of the patients by introducing the steering mechanisms of the private insurance schemes, especially *voluntarily agreed co-payments* and *premium refund* in case of no claims against the insurance within the insurance period.
- Combating rent seeking and principal agent problems by *eliminating excessive interest group influence* (that is to say to diminish or even abolish the influence of the physicians association mentioned in chart 2 and to increase the competition within the pharmacies and pharmaceutical industries sectors).
- *Eliminating* health goods and services with predominantly *cosmetic character* (large parts of dental treatment)
- Improving the knowledge of the population an health *policies and individual health provision*.
- Improving the knowledge of the population with regard to the *functions of insurance schemes* (i.e., the insurance service is the release from an individually often unbearable risk but not the occurrence of the risk assured).
- Implementation of *quality controls* for doctors and hospitals.
- Stepwise intensification of *competition in between the social health insurances*.
- Introducing an *appropriate health insurance size* to avoid problems of adverse selection on the level of the single insurances (merging process between single and also to small insurances).
- Introducing *per-capita-premiums* instead of wage related contributions.[49]

These likely incomplete list of measures would strengthen the social as well as the private health insurances. The remaining problems would be how to combat adverse selection and poverty within such a mixed system. In a fully privatised system the so-called bad risks and people in relative poverty would get a grant for the additional risk premium or a premium subsidy for the poor so that they would remain above the poverty line. Similar measures have to be implemented if the current wage-orientated contributions would be substituted by per-capita-premiums within the social health insurances. Such a switch would not reduce the total systems cost, which is only possible if the above mentioned additional spending cuts are implemented. But the combined effect of such measures would be the separation of wages from the health insurance premium and a remarkable decline in ancillary wage cost, thus improving the employment conditions for labour compared to capital.

Obviously is the necessity for fundamental reforms much more pronounced than the willingness of social politicians to present a courageous draft law to the public. But the long lasting debates on the cumulating problems within the social protection systems have already had some positive impacts beside the half-hearted reforms of the last years, which could be taken as reason for a more optimistic foresight. On the one hand some social health insurances are

[49] Per-capita-premiums would reflect the average risk of an assured individual in the social health insurance; therefore a reform in direction of such premiums would be the prerequisite for a future change to a fully privately based insurance scheme. The in Germany also discussed citizens insurance (Bürgerversicherung) comprising the whole population (in addition to the current system the government officials and the self-employed people) would only cure the symptoms via a revenue increase, which at the same time is connected with increasing entitlements against the social health insurance. The outcome would be an almost total monopolisation of the social insurance system and the end of an independent private health insurance system with harmful consequences for efficiency. For details see *Breyer* (2003) and http://www.buergerversicherung-aktuell.de/index00.html.

rethinking their business strategies and discussing the access to the private health insurance market. On the other hand the private health insurances in Germany very recently have developed an internal strategic paper which discusses a standard tariff. Such a tariff could be opened even for compulsory insurees in the social health insurances, while the costs could be born by a collective funds of the private insurance scheme.[50] Whatever the outcome might be – the front lines are already at least partly dissolved; if courageous but stepwise reforms would also promise the existing social health insurances a prosperous future, the resistance of the old pressure groups could be overcome to the advantage of all: the citizen as well as the employees within the health sector which certainly will play an important role in a modern service society.

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[50] See *Der Spiegel*, Nr. 6, 2.2.04, p. 17; but in a press release the *Verband der privaten Krankenversicherung* has denied the existence of such a paper, see http://www.buergerversicherung-aktuell.de/index00.html.

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Chapter 6:

Social Policy, Higher Education and Environmental Economics

6.1.

World Crisis in Social Security: West Germany

Co-author Karl Heinz Jüttemeier

(Jean-Jacques Rosa (Ed): World Crisis in Social Security, Paris, San Francisco 1982, pp 181 – 205)

6.2.

Gloomy Prospects for Social Retirement Insurance - An International Phenomenon

Co-author Karl Heinz Jüttemeier

(Intereconomics, Hamburg, Vol. 18 (1983), pp 11 – 17)

6.3.

International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care. Comment on Richard M. Scheffler

(Herbert Giersch (Ed): Reforming the Welfare State, Berlin et al. 1997, pp 261 - 266)

6.4.

Systemic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond

(Case Doradcy Sp. z o.o., Forum Ochrony Zdrowia. Warsaw 2004, pp 1 – 26, in Polish Language)

6.5.

Education Return and Financing: Donated Affluence as Consequence of Tuition Free Study Programs in Germany

(Finanzwissenschaftliche Diskussionsbeiträge Nr. 55, Potsdam 2007)

6.6.

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation

(Ecohydrology & Hydrobiology, Warsaw, Vol. 1 (2001), pp 46 – 58)

Education Return and Financing:
Donated Affluence as Consequence of Tuition Free Study Programs in Germany

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Abstract:
The paper sheds some light on the education returns in Germany in the post war period. After describing higher education in Germany the current stand of higher education financing within the single states is presented. In six states tuition fees will be introduced in 2007/08 and discussions are going on in even some more. In the second part of the paper an empirical analysis is done using longitudinal data from the German social pension system. The analysis over the whole lifecycle renders results which proof that the higher education advantages are quite remarkable and might be a justification for more intensified financing by tuition fees. But all this has to be embedded into an encompassing strategy of tax and social policy, especially to prevent a strengthened process of social selection, which would be counterproductive for an increased and highly qualified human capital in Germany.

Keywords:
Education return, tuition fees, tertiary education, vocational education, human capital, lifetime income, income contingent loans

JEL codes:
D1, D14, H81, I21, I22, I28, J13, J24,J26

I. Introduction

Despite of a more then 35 years lasting tradition of tuition free studies in Germany, discussions on introducing tuitions fees for university study programs have gained in public interest and caused harsh disputes on the pros and cons of a tuition free education.[1] While the proponents point out the advantages of free access to university education and a higher participation of students from low income families, opponents lay stress on dubious impacts on education demand as well as on questionable distributive effects of tuition free study programs.[2] But especially the deficits in many state budgets have boosted the re-implementation of tuition fees, particularly more heavily influenced by pressures of the ministers of finance than as a consequence of a careful strategy for a sustainable higher education financing.

[1] For an overview see Petersen (2006) and Kirchner (2007).
[2] See Grüske (1994, 1997).

But short and middle termed budgetary problems should not dominate necessary structural decisions to be made in the German education policy: While higher education is generally defined as a pubic good and financed from the budgets via tax revenue, up to now preschool education has to be financed predominantly by the families, thus causing high burdens on low income families and being one of the main obstacles against equal opportunities for all children. Because of the tremendous demographic challenges in Germany structural changes in education financing are inevitable to mobilize the last educational reserves, avoiding the current problem of structural unemployment because of an increasing mismatch in between skilled and unskilled labour force on various labour markets. The only resource Germany has had and will have in an intensifying international competition is a high qualified human capital, which has to be secured via efficient private decision making but also by state interventions, which do have positive impacts on the educational perspectives and the lifetime incomes of individuals as well as families.

Therefore, in this paper the problems of the education returns within the current generations are addressed, which have been connected with university education in post-war Germany. Such an ex-post analysis only draws a very rough picture on future trends but if we assume that higher education will become even more important in the future, at least some tentative and careful recommendations are possible. Part II gives a short overview on the structure of the German university education and the plans to introduce tuition fees in some of the member states. Some ideas on a postponed financing of tuition fees have been developed, which might come close to income contingent loans being discussed in the international literature in the last two decades.[3] In part III a concise description of the methods and the used data set is presented, while in part IV the most important empirical findings are listed. Part V summarizes the results.

II. University Education and Tuition Fees in Germany

Before the situation in Germany is described in more detail, an overview on the basic system of tertiary education will be given, which concentrates on university education.[4] In a second step the already implemented and the planned tuition systems within the single member states are presented.

II.1. Basic Structure of Tertiary Education

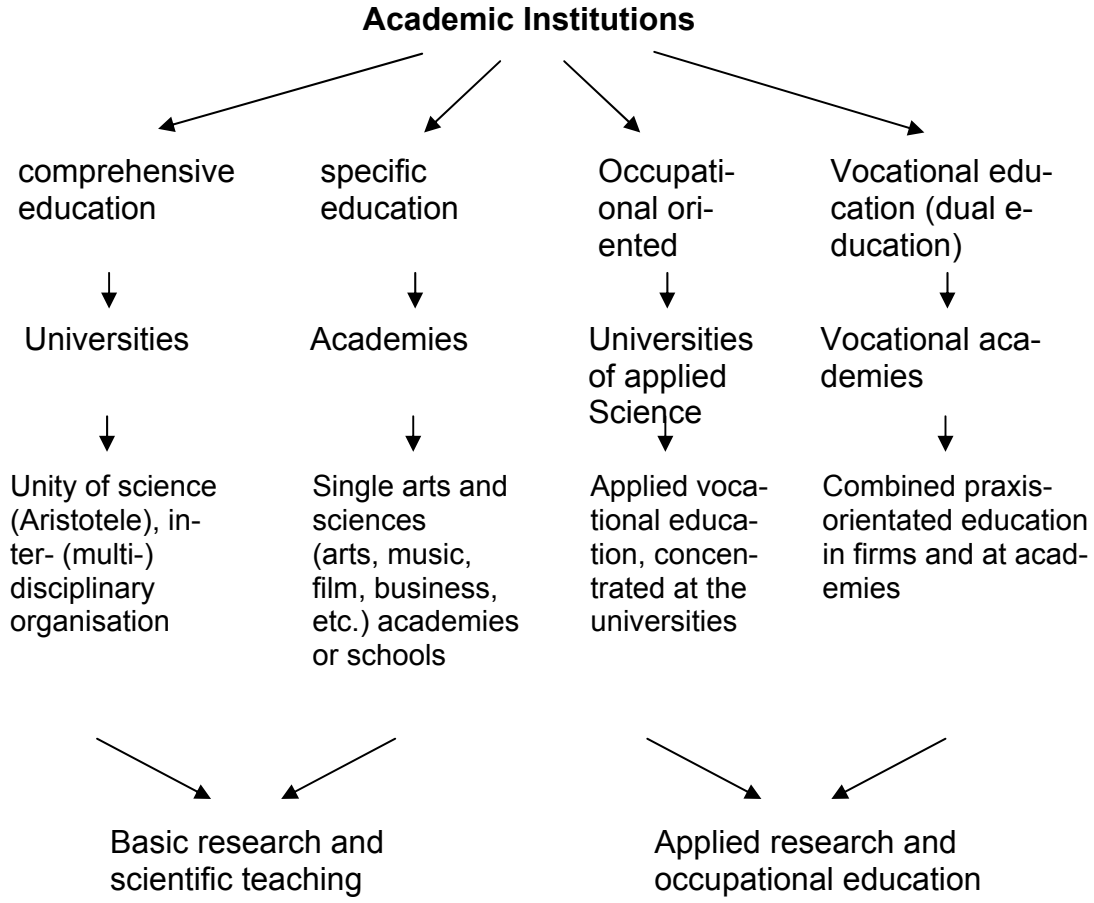
In Germany the universities are the top tertiary education institutions while all the other tertiary education units (academies with specific scope, universities of applied science, occupational academies) are subordinated (see figure 1). Only universities

[3] For details see Chapman (1997, 2002, 2005, 2006a, 2006b) and Kirchner (2007).

[4] Quite similar arguments can also be made for the other educational institutions listed in figure 1. Regarding the vocational education (named in Germany also dual occupational education), which has important relevance for the young generation as well as high international reputation, this education programs are usually not taken into consideration if international comparisons of national freshman ratios. Among 25 selected OECD countries German has in 2005 only the 25th rank (35 % of the young generation in 2005; see Statistisches Bundesamt (2005, p. 41). If at least the qualified vocational education programs would be added, Germany would easily reach the 9th rank of the USA (63 %) or even the 8th of Australia (68 %). In such programs the level of education is often much higher than in most of the BA-programs at US universities.

are allowed to have post-graduate education like PhD programs and especially habilitation procedures (including the junior professors with and without tenure track), in which the next academic generation is educated. Therefore the universities were responsible for quality assurance, which as consequence of the Bologna process has recently been shifted to external accreditation agencies.[5] In the tradition of Humboldt a university represents the collectivity of teaching and learning, while the interaction of research and teaching secures the quality of the education programs, respectively. Freedom of science and teaching[6] determines the democratic frame – university as a "republic of the scientists" in the sense of Kant – and therefore the "democratic group university". This has been altered by many novels of the university laws within the member states of the Federal Republic of Germany in recent years in favour of a model in which the university management has been "professionalised", the latter just meaning a purely steering by introducing simple business methods predominately following microeconomic calculus and controlling measures – as though university management is just a common business for profit maximizing and applying short termed user pays concepts.

Figure 1: Tertiary Education (German Model)



[5] This means that besides the ongoing control by the state ministries of education an additional control mechanism has been implemented, which very likely will strengthen the bureaucratic elements instead of securing more efficiency. Additionally the question arises who is going to evaluate all the new evaluators, which are predominately inventing additional costs. For details see Petersen (2007).

[6] Art. 5 No 3 of the German Constitution (Grundgesetz) as part of human rights secures this freedom: "Art and science, research and teaching are free. Freedom of teaching does not absolve from loyalty to the constitution".

Regarding research one has to differentiate in between basic and applied research, regarding teaching the transfer of academic knowledge and occupational skills has to be taken into consideration, the former more directed to the academics of the next generation, the latter to students aiming for a direct career at the labour markets. Basic research as well as the education of the future academics can hardly be financed privately so that in those fields public regulation or even intervention might be justified. Here the characteristics of public goods apply. As far as pure occupational skills are in the focus of tertiary education, this kind of human capital formation has usually led in the past (see part IV below) and hopefully will lead in the future to a personal income advantage on the labour markets whereas the future risks and insecurities within the labour markets have to be taken into consideration. Hence, in general occupational education does lead to an individual advantage in form of an increased income flow in the future; therefore, the increased human capital can be measured as the discounted future income flow (present value concept). Consequently the occupational education is principally marketable, while marketability may be influenced by the day-to-day risks in the lifespan.

Market failure in basic research and scientific education do justify state interventions into the markets for tertiary education what does not mean the implementation of a state monopoly as it still is dominating in Germany. Competition with private schools and even universities is of utmost relevance to prevent state universities from resting themselves because of their convenient position (in quasi-natural monopolies). But instead of concentrating research and scientific education at the universities and sending students to the universities of applied sciences where they would get a practical oriented education leading directly into the labour markets, the majority of the students has been channelled into the universities because here the per capita educational costs were lower than within the universities of applied science. This obviously has contributed to quality erosions within the universities study programs.

In fact in Germany currently (2005/2006) 103 universities, 64 academies for specific education and 202 universities of applied science (including the state universities of applied science for their employees) do exist. While in pure numbers the universities of applied science are clearly dominating, the numbers of enrolled students are totally converse: from 1,96 Mio. Mio. students 1,4 Mill. (71.5 %) study at universities while only 0,56 Mill. (28.5 %) are enrolled at universities of applied science.[7] This excess burden on the universities, which strongly increased during the last two decades, has forced many university professors to reduce their research work so that many of them do not any longer fulfil the demand of excellence. With regard to international research standards, German universities have lost in competitiveness and reputation. Parallel budgetary cuts have also created additional negative incentives for research and partly for teaching, too.

[7] See Statistisches Bundesamt (2005) and Petersen (2006).

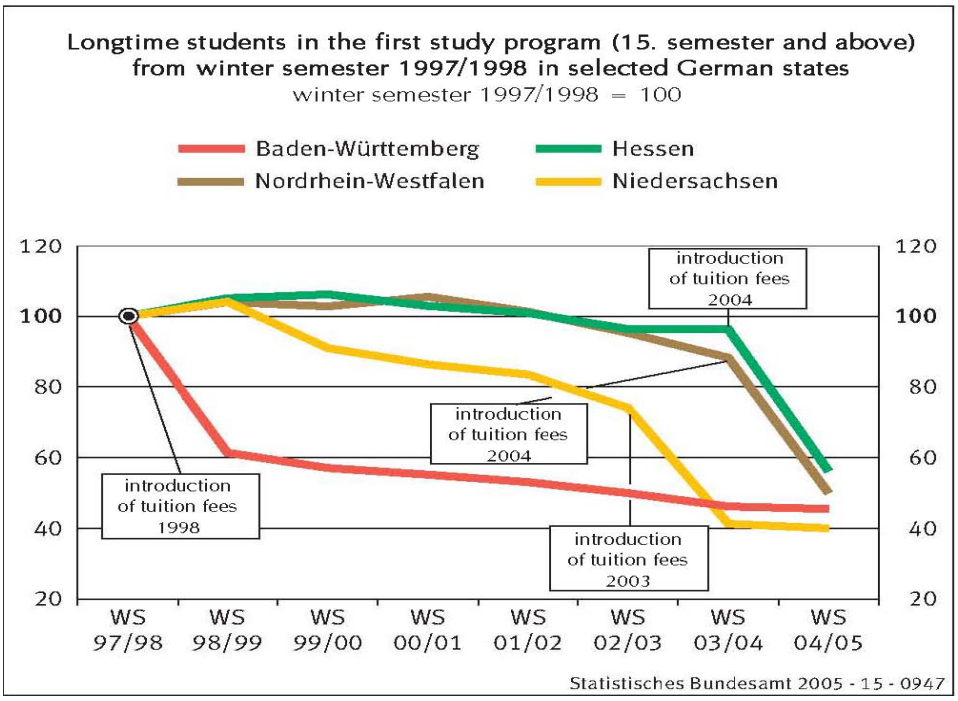
II.2. Existing and Planned Tuition Fees in Germany

For a systematic change in education financing initially the cost components have to be determined, which should not be financed by general tax revenue but by individual tuition fees. Costs for basic research and scientific education would have to be isolated because those do have predominately the character of public goods. In view of the limited knowledge from business administration regarding combined production, obviously the fixed costs will prevent any definite separation so that political decision making is necessary. In the justifications and consultations connected with the reintroduction of the tuition fees in some German states, rational explanations and justifications are badly missing. The tuition fee laws are more determined by ideological reasoning, while facts on the subject (who has to pay), object (for what has one to pay) and tariffs (how much is the fee burden) are only defined in a very imprecise manner – breaching traditional rules as for instance have been set by Adam Smith for taxation.

Figure 2: Tuition Fees in the German States for Long Time Students and Students in the Second Study Program

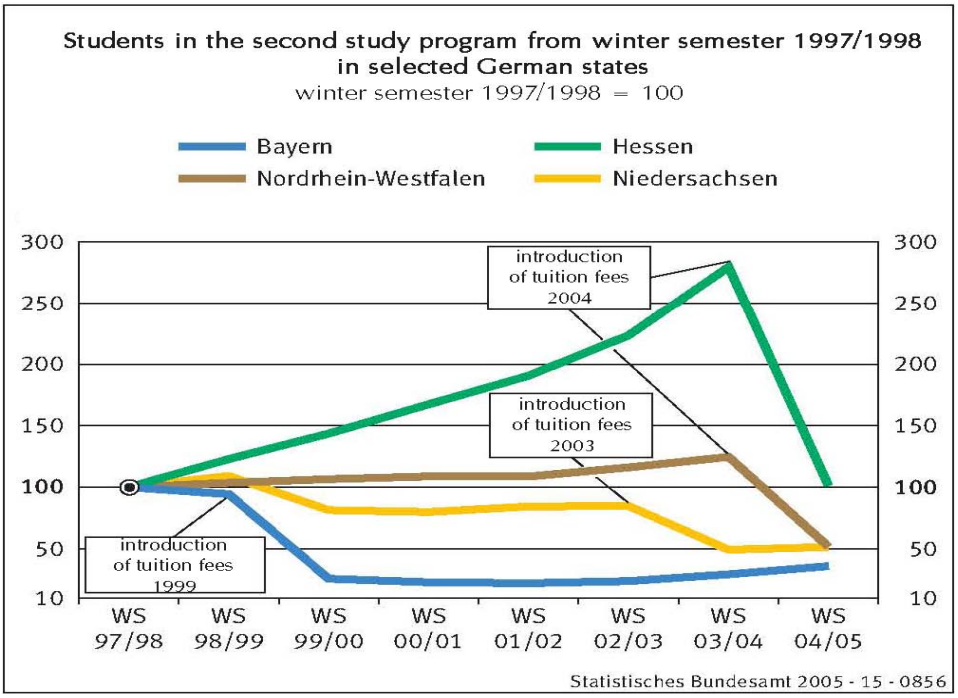
Before general tuition fees have been implemented, some German states started already in 1998/99 in inventing fees for long time students (some terms above the normal study time, which is nine terms in average) and/or students in a second study program. How those fees are spread in Germany is shown in figure 2. Such fees have had some impacts on the study behaviour. Especially the fees for long time students in Baden-Württemberg, Hessen, Nordrhein-Westfalen and Niedersachsen have led to a clear drop in the number of long term students, which already in the period of the discussions of that change have had a slightly reducing impact (see figure 3).

Figure 3: Impact on Long Time Students



Similar trends can be observed with regard to the student numbers studying in a second study program; the severest changes have taken place just after the implementation while in Bayern since the introduction of tuition fees a slight increase can be observed (figure 4).

Figure 4: Impact on Students in the Second Study Program



The „tuition fee laws“ to introduce tuition fees for all students or for students in the first semester were implemented in 2006/07 (see figure 5). The law titles were affected by ideological formulations: for instance the “law to secure justice in financing the universities” in Nordrhein-Westfalen (NRW). In § 2 of Article 2 in the “law to impose tuition fees and university duties” the tuition fees are described as following: “The universities are legimitated by a tuition fee by law to raise tuition fees for students in the study programs in which they are enrolled to raise for each semester a study contribution up to 500 Euro. By determining the amount of the study contribution the universities are obliged to relate that amount to the targets, which will contribute to an efficient and high quality study program, sharpening the profile of the university and increasing the competition in between the universities”. This amount of 500 Euros was mentioned in a verdict of the German Constitutional Court in 2005 as maximum burden to be imposed on the students.

The *contribution base* is to be enrolled at a NRW-university and neither connected with a specific study program nor to concrete cost elements (or income advantages as it is the case in Australia). How the revenue has internally to be used by the universities (e.g. related to the number of students or the former budgetary structures) is not regulated. *Contribution subject* is the student what again is quite imprecise because normally he/she has no own income or property so the parents/families have to pay, which is enforced by the German maintenance obligation of the Civil law. Exeptions are only possible if the postponed financing (via loans) is a functioning alternative. The *contribution schedule* is a lump sum payment, which can be compared to a lump sum tax. The redistributive impact is quite similar, the lower income brackets are more heavily burdened.

For social cushioning the redistributive impacts of such a contribution scheme the third part of the respective law in NRW regulates the postponed financing by loans and the fourth part the cost coverage in case of loan default. The politicians in NRW

intended to release the banks from the loan default risk to affect the effective interest rate being hold on a moderate level. According to § 17 of the “Studienbeitrags- und Hochschulabgabengesetz – StBAG” the NRW universities are obliged to pay 23 % of their tuition fee revenue into an equalisation funds organized by the NRW-Bank, which is a public bank of the state.The universities do get 385,00 Euro, while 115,00 Euro are paid into the funds to cover for the costs of loan defaults.

Obviously such a solution is far way from strengthening competition neither in between the involved banks nor in between the universities. The NRW universities have already reacted as cartels usually react: all universities and universities of applied science in NRW have introduced the highest possible contribution rate. Old concerns have been changed in a moment’s notice and suddenly the proponents of tuition fees are dominating. The tuition fee multiplied by the number of students renders a promising amount of revenue especially for universities concentrating on the huge faculties (economics and business as well as law) and without expensive medical schools. In fact only 77 % of tuition fee revenues will strengthen the budgets of the universities and questions arise if really the faculties with the large student numbers do profit. Currently the internal distribution within the single universities is still unclear – distributive battles are more than likely. With the remaining 23 % the students are financing the loan default – that means at least partially they are financing with their present tuition fees the reduced capital costs of the loan system. A new redistributive wheel has been put into operation, which at least partly might be directed in favour of the bad risks. Figure 5 gives a brief overview on the different situations within the German federal states.

Figure 5: Tuition Fees in the German States (2006/07)

State	Tuition fees 1. semester	Long time tuition fees	Administrative fees etc.
Baden-Württemberg	Introduction SuS 07	Study deposit 511,29 Euro after normal study period	Administrative fee 40 Euro/Sem.
Bayern	General tuition fees SuS 07	500 Euro/sem. after normal study period	Administrative fee 50 Euro/Sem.
Berlin			Enrollment fee 51,13 Euro/Sem.
Brandenburg			Enrollment fee 50 Euro/Sem.
Bremen		Study account with study deposit (until 14. Semester)	Administrative fee 50 Euro/Sem.
Hamburg	Introduction 1. sem. WS06/07, general SuS 07	Study deposit 500 Euro/sem. after normal study period	
Hessen	Art. 59 LandesVerf tuition free education, changes to come	Study deposit 500 Euro/sem. after normal study period	Administrative fee 50 Euro/Sem.
Mecklenburg-Vorpommern			
Niedersachsen	Introduction 1. sem. WS 06/07, general SuS 07	Study deposit 500 Euro/sem. after normal study period	Administrative fee 75 Euro/Sem.
Nordrhein-Westfalen	Introduction 1. sem. WS 06/07, general SuS 07	Study account 650 Euro/Sem., after 1,5 x Norman study period	
Rheinland-Pfalz	Benefit equalisation scheme proposed	Study deposit 500 Euro/sem. after normal study period	
Saarland	Introduction WS 07/08	Study deposit 500 Euro/sem. after normal study period .	
Sachsen	Proposal of a loan and tuition fee model (Milbradt)		
Sachsen-Anhalt		500 Euro/sem. after normal study period	
Schleswig-Holstein			
Thüringen		500 Euro/Sem. after normal study period	

SuS = Summer semester, WS = Winter semester.
Source: Deutsches Studentenwerk (http://www.studentenwerke.de/main/default.asp?id= 03203, 20.01.2006).

III. Data and Methods Used

For the determination of the education returns the lifetime income profiles of employees with different educations and job careers have to be compared. For the analysis of such differences in lifetime income the data of the research data centre of the German social pension system is used.[8] In III.1. a brief description of the data set is given and some basic results are presented. Part III.2. concentrates on a concise summary of the calculations of the labour income and the determination of the education returns.

III.1. Data and Reward Points

The scientific use file "Vollendete Versichertenleben 2004 (VVL2004)" (completed insurance life cycles) is a longitudinal data file with panel characteristics.[9] This file is the first one in Germany, which represents the complete biography of employees with different qualities of education. The data file is based on the reward points within the German pension formula, which can easily be transformed into wage figures. Because the reward points are defined in relation to each annual average wage, the real wage position within the wage distribution is defined and therefore the impact of inflation neutralised. The data have been extracted from the individual pension accounts, which contain the exact monthly wages as well as the employment situation over the whole life cycle. For the following analyses the data set was separated for male and female employees and different education levels. Table 1 shows the number of cases within the single groups.

Table 1: Number of Cases in the SUFVVL 2004

	Male	Female	Total
Lowest level of education with the lowest school leaving certificate without vocational education (*education level 1*)	*593*	*1125*	*1718*
Lowest level of education with the lowest school leaving certificate with vocational education [1] (*education level 2*)	*3508*	*3215*	*6723*
Abitur without vocational education (*education level 3)*	*27*	*23*	*50*
Abitur with vocational education [1] (*education level 4*)	*94*	*70*	*164*
University of applied science[2] (*education level 5*)	*366*	*49*	*415*
University (*education level 6*)	*309*	*90*	*399*
Total	*4897*	*4572*	*9469*

[1] completed vocational training („Lehre" or „Anlernen"), certificate of a vocational/technical school.
[2] former denotation: „höhere Fachschule"

Source: FDZ-RV – SUFVVL2004, own calculations.

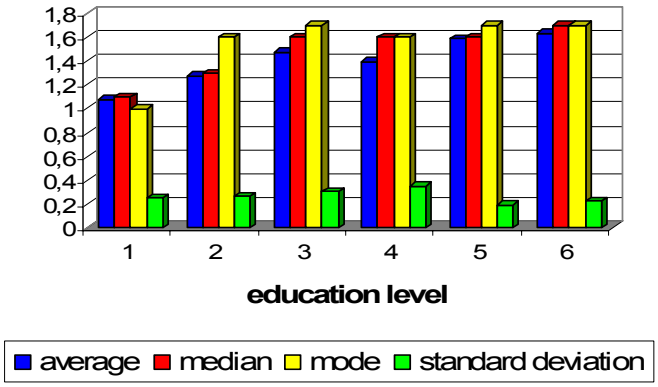
In table 1 the terms for the school system are translated due to the German characteristics. Level 1 is the lowest level of education with the lowest school leaving certifi-

[8] For the limits of such analysis see Kirchner (2007, pp. 171).
[9] For detail see Himmelreicher (2006).

cate (or even without) and without any vocational education (low skilled employees). The second educational level on the same school level has completed a vocational education, the third level has an abitur without vocational education, the fourth an abitur with vocational education, the fifth a degree from a university of applied science and the sixth a university degree. These education levels 1 to 6 are used in all the following figures and tables.

Due to size restriction only one example of several analytical approaches is demonstrated here. Obviously the lifetime income and the derived individual pension entitlement depend on the annual income and the number of contribution years – unemployment in the single years left aside. Usually (especially in West-Germany) male employees do have longer work careers than female employees. Beyond that there are still gender differences with regard to the monthly and annual wages. Figure 6 shows the reward points per year of fulltime work (male).

Figure 6: Reward Points per Year of Fulltime Work (Male)



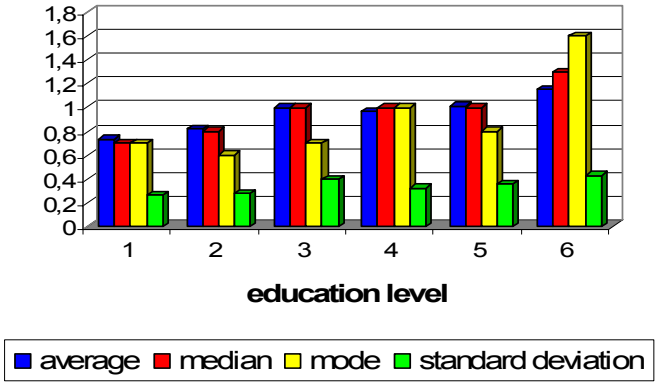
Source: FDZ-RV – SUFVVL2004, own calculations.

The results demonstrate that with increasing level of education the monthly reward points are increasing; while the first level almost earns the average wage (reward point 1.0) the fifth and sixth level earn about 1.6 times as much. Male with university education have a mean value of 1.63 and with education at universities of applied science with 1.59. In the lowest levels a vocational education increases the mean values from about 1.0 (level 1) to 1.2 (level 2). Surprisingly the male with abitur but without vocational education do have higher reward points (1.5) than male with abitur and vocational education (1.4). This might be explained by the fact that among the former group are a large number of university drop outs without university degree who have been quite successful in their job careers.[10]

With regard to the female similar trends can be observed: the reward points are increasing with a higher education level. But the level of reward points is much lower as in case of the male (see figure 7).

[10] Even in the public sector in the past such people have been comparatively successful. That might change in the future because of the strongly increasing numbers of employees with university degrees.

Figure 7: Reward Points per Year of Fulltime Work (Female)

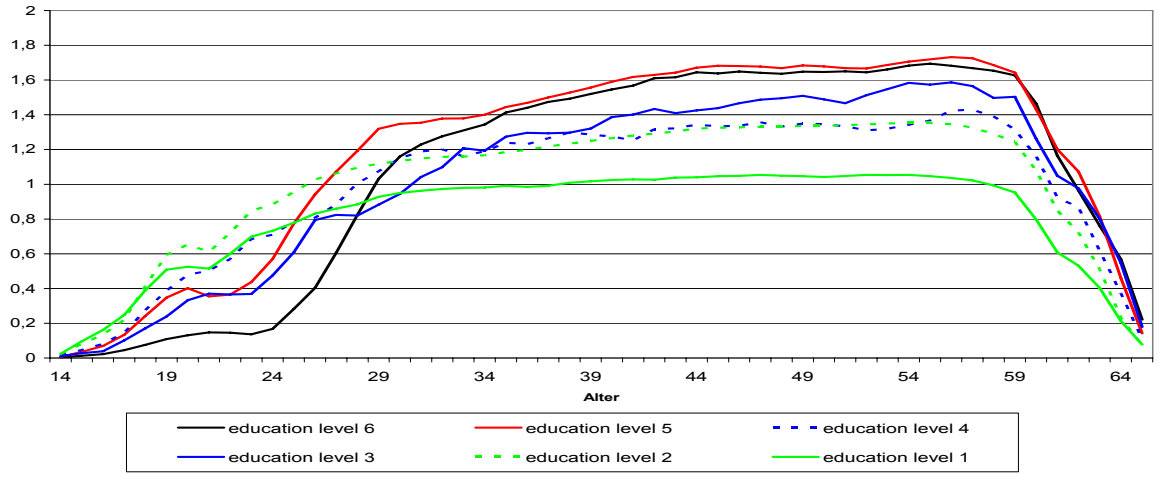


Source: FDZ-RV – SUFVVL2004, own calculations.

Figure 7 demonstrates that female can reach the average reward points only with abitur; without abitur they earn 0.7 (education level 1) or 0.8 (education level 2) reward points. Female with university degree have earned 1.15 reward points; that is much less (0.48) than the reward points of male in the same group.[11]

The development of the reward points over the lifetime is shown in the following two figures; hence, the reward point patterns take into consideration times of vocational education, minor employment, self-employment and times of employment with obligatory social insurance. For this purpose distorting impacts like home care of relatives, child education and unemployment have been eliminated. In figure 8 the relative income patterns for male are presented.

Figure 8: Reward Point Patterns for Male in the Lifecycle



Source: FDZ-RV – SUFVVL2004, own calculations.

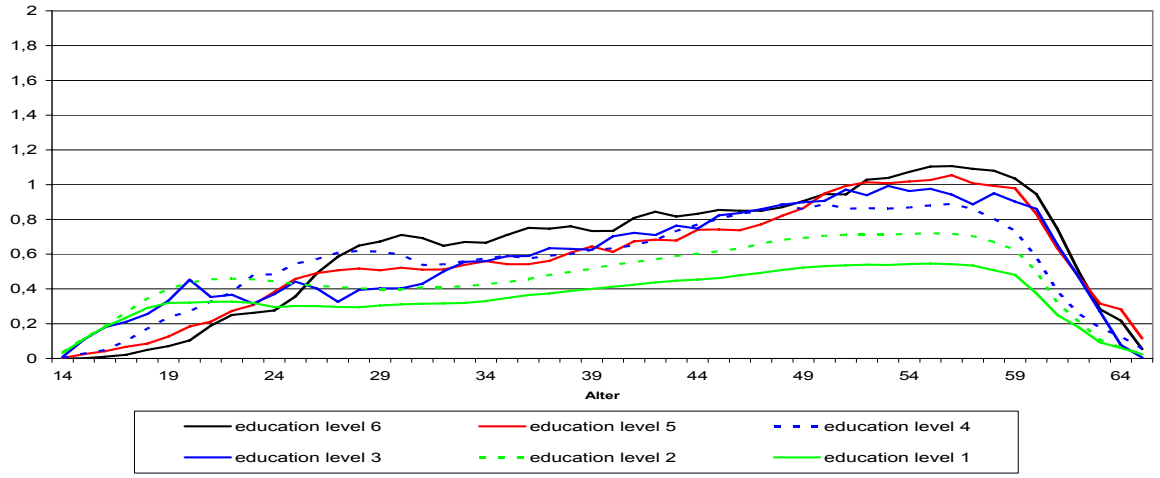
[11] One has to bear in mind that this group has started the job career in the late 1950ties. In the meantime the wage differences in between male and female have declined but not jet been equalised.

As easily can be seen, the university graduates (education level 6) do earn much less than all the other groups in the first years of working life. In this period the male with education level 1 and 2, respectively, have the highest income positions. During the course of the following years the university graduates catch up und pass the other education levels, excluded the graduates from the universities of applied science (education level 6). The latter do have almost without any exceptions higher reward points than the university graduates. The reason might be that the graduates from universities of applied science are far more technical orientated, which has been of utmost relevance in the first phase of reconstructing industry and infrastructure in Germany after World War II. The absolutely lowest level of reward points have male of education level 1. Over the whole life cycle in average they reach only in very few years the average wage within the social insurance scheme (reward points 1.0) or exceed it slightly. The above underlined relevance of occupational education is also demonstrated in this figure. With a complete occupational/technical education, male have earned in between the age of 35 and 60 clearly more than 1.2 reward points.

Furthermore it is obvious that for all levels of education the average reward points curves do strongly decrease at the age of 59/60 because early retirement plans have played an important role for the cohorts of employees being under consideration. This is underlined by the fact that within the data set 45 % of the male retired before the age of 63 without any significant differences in between the education levels.

The following figure 9 presents the development of the reward points for the female. Here the same trends are shown like in figure 7 which demonstrates that female do have much less reward points even over the whole lifespan than male. Regarding the education levels the patterns for female are principally similar to those of the male. The value of the reward points is increasing with higher education levels and in the first age segments the lower education levels do have higher reward points predominantly caused by the earlier entry into the working live.

Figure 9: Reward Point Patterns for Female in the Lifecycle



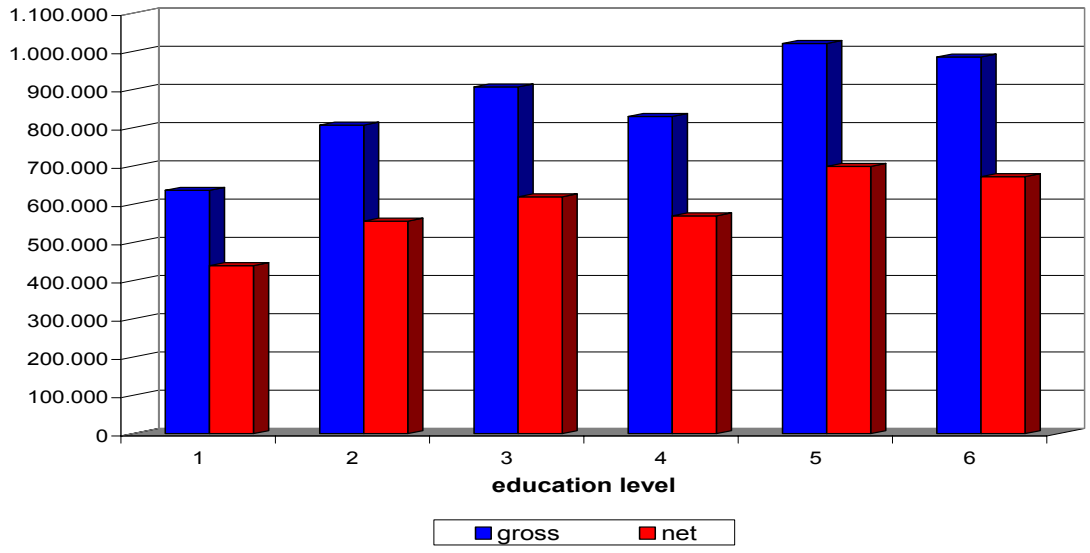
Source: FDZ-RV – SUFVVL2004, own calculations.

A common feature is that as in case of the male the female within the lowest education levels have the lowest wages. They do not earn more than 0.6 reward points and in level two the female almost never exceed 0.7 in their whole lifespan. Contrary to the male the female with university education (level 6) have nearly over the most years of the lifecycle (from the age of 28 to 62) had the highest reward points, clearly higher than the female graduates from the universities of applied science. However, only the two highest education levels are able to exceed the value of 1.0. Having university graduates in mind, male exceed this value in the age of 29, while female reach that value only in an age of about 51. That also demonstrates that the career profiles in this age cohort are quite different for male and female, the latter having massive disadvantages because of their multiple responsibilities within the families. Additionally the data set proofs that in the average of all education levels female retire predominantly in the age of 62, while the female with university degree have the longest working period (retirement with 62.5).

III.2. Labour Income and Education Returns

The reward points can be transformed by the average gross and net annual wages for all compulsory insured within the social pension system into annual Euro amounts. The lifetime income is than calculated from the end of the age of 14 until the retirement. Figure 10 shows for the lifetime gross and net income the same characteristics as the reward points (see figure 6 above). Principally lifetime income is increasing with increasing education level (exception level 6 compared to level 5 as discussed above).

Figure 10: Estimated Lifetime Income for Male (Gross and Net, in Euro)



Source: FDZ-RV – SUFVVL2004, own calculations.

The graduates from universities as well as universities of applied science in the average have earned about 1 Mio. Euro as compulsory insured lifetime income. In this context it has to be mentioned that in Germany a upper limit within the social pension insurance does exist, which practically cuts the income of this groups, which effectively are often much higher than this income limit. Therefore the effective income

differences are in reality much higher than shown in the graphs above. The graphs also demonstrate that the trends are similar with regard to the net lifetime income but progression within the income tax system reduces the net differences in between the different levels of education.

Table 2 gives information on a pairwise comparison of the different education levels with regard to gross and net lifetime income, where the lifetime income of level B is subtracted from lifetime income of level A. A vocational education then renders compared to the same school level but without a vocational education in a lifetime income difference of 170,351 Euro gross and 116,537 Euro net. A university graduate earns 102,684 Euros net (155,702 Euro gross) more than a male with abitur and completed vocational education (for graduates from universities of applied science the difference is with 129,659 Euros net and 191,146 Euros gross even higher). In total the university education leads to a substantially higher income flow over the whole lifespan, especially compared to the lowest education levels. However, the latter are financing with their direct and indirect taxes the tuition free education of the higher education levels.

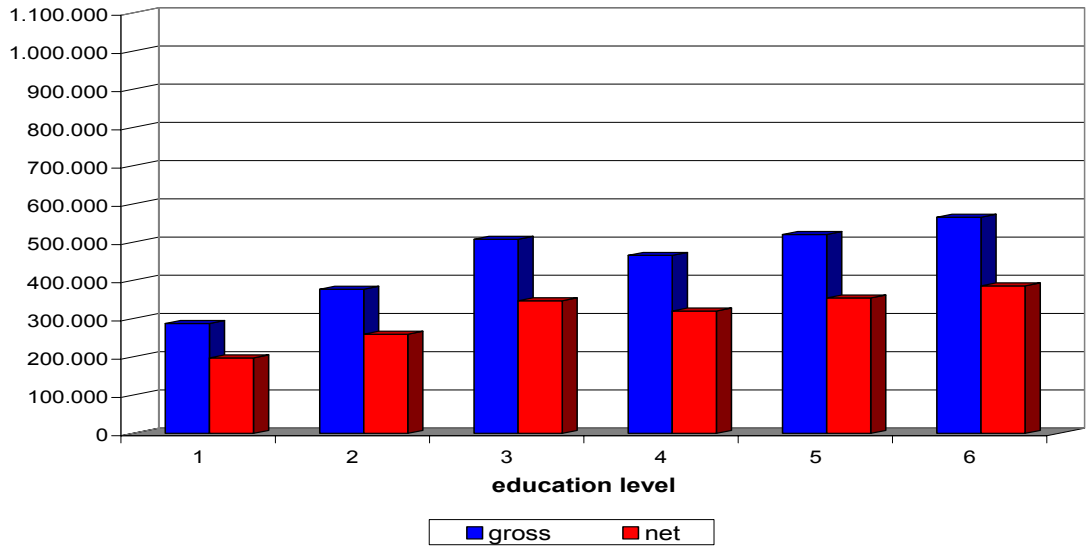
Table 2: Differences in Lifetime Wages of Male for Different Education Levels (Euro)

A	Differences in lifetime wages from B compared with A		B
	gross	net	
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*+170.351*	*+116.537*	Lowest level of education with the lowest school leaving certificate without vocational education (2)
Abitur without vocational education (3)	*-77.492*	*-50.231*	Abitur with vocational education (4)
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*+270.529*	*+180.278*	Abitur without vocational education (3)
Lowest level of education with the lowest school leaving certificate without vocational education (2)	*+22.686*	*+13.511*	Abitur with vocational education (4)
Abitur without vocational education (3)	*+113.654*	*+79.428*	University of applied science (5)
Abitur without vocational education (3)	*+78.209*	*+52.453*	University (6)
Abitur with vocational education (4)	*+191.146*	*+129.659*	University of applied science (5)
Abitur with vocational education (4)	*+155.702*	*+102.684*	University (6)

Source: FDZ-RV – SUFVVL2004, own calculations.

The lifetime incomes of the female are transformed in the same way as for the male. The difference for female with university degree and female of the lowest education level 1 is about 280,000 Euro gross. Female university graduates therefore got almost twice as much lifetime income than female of level 1. Opposite to the male the university graduates do have the highest lifetime income (565,743 Euro compared to 520,315 Euro of graduates from the universities of applied science).

Figure 11: Estimated Lifetime Income for Female (Gross and Net, in Euro)



Source: FDZ-RV – SUFVVL2004, own calculations.

Table 3 again gives information for pairwise comparisons of the different education levels for female.

Table 3: Differences in Lifetime Wages of Female for Different Education Levels (Euro)

A	Differences in lifetime wages from B compared with A		B
	gross	net	
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*+89,679*	*+61,767*	Lowest level of education with the lowest school leaving certificate without vocational education (2)
Abitur without vocational education (3)	*-42,036*	*-26,633*	Abitur with vocational education (4)
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*+220,312*	*+148,968*	Abitur without vocational education (3)
Lowest level of education with the lowest school leaving certificate without vocational education (2)	*+88,597*	*+60,567*	Abitur with vocational education (4)
Abitur without vocational education (3)	*+12,384*	*+7,397*	University of applied science (5)
Abitur without vocational education (3)	*+57,813*	*+39,007*	University (6)
Abitur with vocational education (4)	*+54,420*	*+34,031*	University of applied science (5)
Abitur with vocational education (4)	*+99,848*	*+65,640*	University (6)

Source: FDZ-RV – SUFRTZN04XVSBB, own calculations.

Summarising the results it has become obvious that female of this cohort (retirees of 2004) have earned much less than male even in a lifetime perspective. It has to be mentioned that in many cases university graduates were not employed in jobs being eligible for the social pension insurance. Many self-employed people with comparatively high lifetime incomes and the public employees (“Beamte”) are not included into this data set. Therefore, the income differences in favour of the high education groups are very likely heavily underestimated. As already mentioned above, in the following cohorts equal opportunities for women have been strongly improved so that the male/female difference will decline. But the employment situation for low skilled work due to increasing global competition was dramatically worsened in the last two decades as the unemployment rations demonstrate; therefore, the income differences in between the education levels might increase over time so that future analyses of those trends are of utmost relevance.

For the estimation of education returns in the literature different methods are used;[12] the Mincer method is a well known one, which is based on regression analysis. The basic shortcoming is that this estimation assumes an equal return for each year of education independent from the level and kind of education. Thus, a longer education would yield in higher returns from education. An alternative is the estimation of the internal interest rate, in which the returns and costs for each year are determined. Hence, it is possible to differentiate in between different levels and kinds of education. The internal interest rate is calculated in accordance to the standard approach of the present value concept. The disadvantage of this concept is that data are necessary, which are partly available only in the future or the income effects of educational measures have to be determined in advance. Therefore Ammermüller/Dohmen have developed the "short-cut method", which is based on the internal interest rate but implies an easy approximation: the income of a superior education level is subtracted from an income of an inferior education level and divided by the income of the inferior education level. This simplified rule is used for the following comparisons.

IV. Education Returns, Opport unity Costs and Capital Formation

In the following chapter the lifetime wages are discounted on the entry into the retirement age and the education returns for the discounted and undiscounted lifetime wages determined (IV.1.). In Germany it is often argued that the period used for the study program is connected with high losses in form of market income. This opportunity costs argument is discussed in IV.2. Additionally it has to be taken into consideration, that higher lifetime incomes are also often connected with a higher saving capacity. Therefore in chapter IV.3. it is analysed if the higher education levels do have a systematically higher amount of capital, which beside the higher wages would also increase their total lifetime income (wages plus capital income).

IV.1. Education Returns

The average gross lifetime wage of male with university degree (level 6) was 18.8 % higher than of male with abitur and vocational education (level 4). The graduates from university of applied science had a wage advantage of about 23 % (4.2 percentage points more than university graduates). These estimations do not take into consideration that the wage were generated at different times in the past. Therefore it is necessary to discount the wage flows. As discount rate an interest rate without high risk was chosen.[13] The on the year 2004 discounted wage flows for male are presented in table 4.

[12] See Mincer (1974), Ammermüller/Dohmen (2004) und Kirchner (2007).
[13] The interest rate for saving deposits with four years duration has been chosen, which in between 1970 and 2003 was 6.19 %; see Kirchner (2007).

Table 4: Discounted Gross Lifetime Wages of Male (Euro)

Education level	Discounted gross life-time wages
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*2.170.175*
Lowest level of education with the lowest school leaving certificate with vocational education (2)	*2.693.610*
Abitur without vocational education (3)	*2.735.528*
Abitur with vocational education (4)	*2.661.001*
University of applied science (5)	*3.170.087*
University (6)	*2.904.114*

Source: FDZ-RV – SUFRTZN04XVSBB, own calculations.

The discounting method obviously has an impact on the education returns. As consequence the rate of return for university graduates (level 6) compared to male with abitur and vocational education (level 4) is less than half as much (9.1 %). The reason is that the latter do have a wage flow, which in the first period of the lifespan is much higher than that of the university graduates (see figure 8 above) and therefore are more “profiting” from the discounting method. The rate of return of the graduates from the universities of applied science is reduces from 23 % to 19.1 %. The lower reduction compared to the university graduates can be explained with the earlier entrance of them into working life. Because of those methodological differences in table 5 the rate of returns for the undiscounted and the discounted wage flows are presented.

Table 5: Education Returns Male (percent)

A	Education returns from B compared with A		B
	not discounted	discounted	
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*26,8*	*24,1*	Lowest level of education with the lowest school leaving certificate without vocational education (2)
Abitur without vocational education (3)	*-8,5*	*-2,7*	Abitur with vocational education (4)
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*42,5*	*26,1*	Abitur without vocational education (3)
Lowest level of education with the lowest school leaving certificate without vocational education (2)	*2,8*	*-1,2*	Abitur with vocational education (4)
Abitur without vocational education (3)	*12,5*	*15,9*	University of applied science (5)
Abitur without vocational education (3)	*8,6*	*6,2*	University (6)
Abitur with vocational education (4)	*23,0*	*19,1*	University of applied science (5)
Abitur with vocational education (4)	*18,8*	*9,1*	University (6)

Source: FDZ-RV – SUFRTZN04XVSBB, own calculations.

In the following table 6 the gross lifetime wages of the female are show, again discounted on the entry into their respective retirement age and for the different education levels.

Table 6: Discounted Gross Lifetime Wages of Female (in Euro)

Education level	Discounted gross lifetime wages
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*952.289*
Lowest level of education with the lowest school leaving certificate with vocational education (2)	*1.250.272*
Abitur without vocational education (3)	*1.538.434*
Abitur with vocational education (4)	*1.498.542*
University of applied science (5)	*1.508.280*
University (6)	*1.675.931*

Source: FDZ-RV – SUFRTZN04XVSBB, own calculations.

Also in this case similar differences within the rate of returns are estimated. Hence, the rate of return for the discounted lifetime wages is with 11.8 % by 9.6 percentage points lower than for the undiscounted income figures. And the comparison of the female with abitur and completed vocational education (level 4) shows that their lifetime income is slightly below that of the female graduated from the universities of applied science (level 5). In the undiscounted comparison the latter has been 11.7 % higher because of the fact that this discounting methods is weighting the former working life periods more strongly than the later. In both cases – for male and female – the discounting methods result in a decrease of the rates of return compared to the undiscounted figures. Table 7 gives an overview on the education returns for female.

Table 7: Education Returns Female (percent)

A	Education returns from B compared with A		B
	not discounted	discounted	
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*31,2*	*31,3*	Lowest level of education with the lowest school leaving certificate without vocational education (2)
Abitur without vocational education (3)	*-8,3*	*-2,6*	Abitur with vocational education (4)
Lowest level of education with the lowest school leaving certificate without vocational education (1)	*76,6*	*61,6*	Abitur without vocational education (3)
Lowest level of education with the lowest school leaving certificate without vocational education (2)	*23,5*	*19,9*	Abitur with vocational education (4)
Abitur without vocational education (3)	*2,4*	*-2,0*	University of applied science (5)
Abitur without vocational education (3)	*11,4*	*8,9*	University (6)
Abitur with vocational education (4)	*11,7*	*0,7*	University of applied science (5)
Abitur with vocational education (4)	*21,4*	*11,8*	University (6)

Source: FDZ-RV – SUFRTZN04XVSBB, own calculations.

Using this data file has improved the estimations of education returns. All estimations having been made before are concentrating on average income figures only in one basic year or comparatively short periods of the lifespan. The long term effects of education have not been adequately incorporated. A critical point which still remains is that the data are historical and heavily dependent on the growth developments and the business cycles of the past. Additionally transfer payments (especially payments for students from low income families; BAföG = Bundesausbildungsförderungsgesetz) are also not taken into consideration. Beyond that the data set does not differentiate in between different study programs and subjects. Additional information remains necessary to justify a more sophisticated tuition fee system.

IV.2. Opportunity Costs

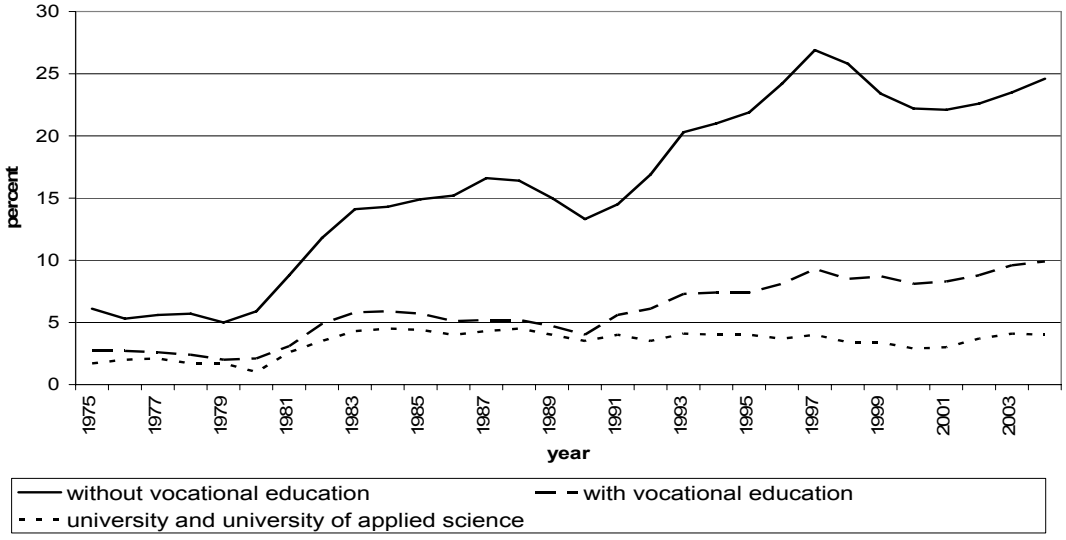
The opportunity costs argument is heavily dependent on the assumptions about the labour market chances for young people with abitur but without tertiary or occupational education. In a publication for the CHE (Centrum für Hochschulentwicklung der Bertelsmann Stiftung) Schuller et al. (2000) have estimated opportunity costs of 74,865 Euros for law students and of 273,785 Euros for social pedagogic students,

based on a study by Lüdecke/Beckmann (2000). Such figures obviously provoke the questions how the differences of almost 200,000 Euro can be explained and who with abitur and no occupational education does earn more than 250,000 Euro in the first five years of the working career?

If a bank assistant is taken into consideration, he/she would earn about 23,000 Euros (in 2005) in the first three years of occupational education and in the two years after about 37,500 Euros (in total roughly 60,500 Euro). From this amount one has to subtract the consumption expenses, which amount over a five years period to about 45,000 Euro.[14] These expenses are financed by the families via intra-family transfers and/or social transfers (like BaföG). Therefore the effective income advantage for a bank assistant is reduced to roughly 15,000 Euros. Figure 8 and 9 above demonstrate that even some students of universities and universities of applied science do at least part-time work, what additionally decreases the opportunity costs by some thousand Euros.

Beyond that the competition in the markets for unskilled labour and for occupational/technical education would be strongly increased if larger numbers of young people with abitur would be pushed into those labour markets. Many of the less qualified would be displaced and youth unemployment even increased because for low skilled workers the unemployment ratios are considerably higher than for people with occupational education or university graduates (see figure 12). Consequently the remuneration in these markets and the wages would likely more or less strongly be reduced and some would find no adequate jobs so that the opportunity costs would be almost zero or even born by other young people whose job chances would be jeopardised.

Figure 12: Unemployment Ratios for Different Qualification Levels



Source: *IAB*: Qualifikationsspezifische Arbeitslosenquoten, http://doku.iab.de/kurzber/2005/kb0905_anhang.pdf.

[14] The average expenses of a student's household are about 750 Euro a month; for details see Petersen (2006, pp. 13). Additionally it has been taken into consideration that students do get lots of real transfers in form of subsidised dwelling, reduced prices for meals in the students' union, reduced prices for local traffic, cheap health insurance premiums, etc. Those subsidies even increase the real monthly income and reduce the opportunity costs.

Moreover figure 8 and 9 above demonstrate that even some students of universities and universities of applied science do at least work part-time. The average income is roughly one third of the education levels 1 and 2 so that the opportunity costs are even more reduced. In total, the opportunity costs argument, which is often cited as justification for a higher income in the later working time period does obviously not fully and in many cases not at all compensate for the lifetime income advantages of higher education.

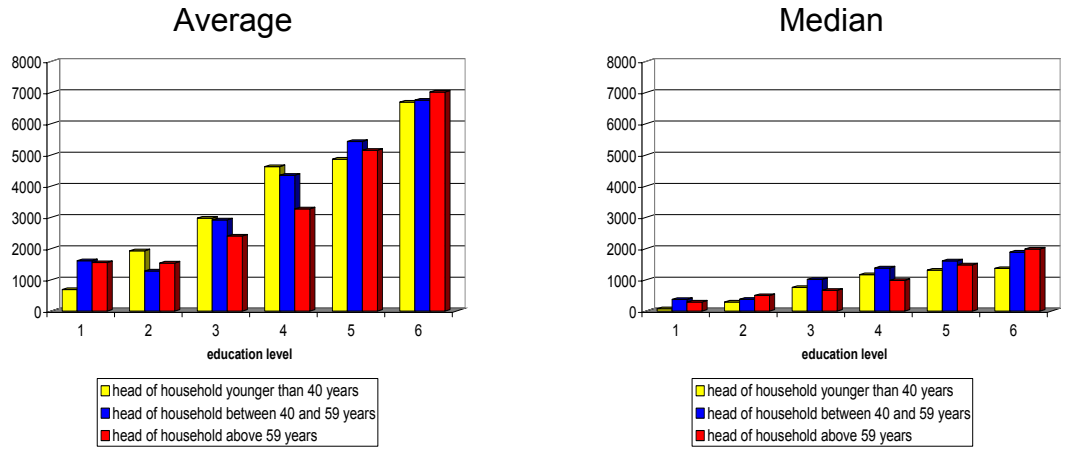
IV.3. Capital Formation

As already mentioned above, the lifetime income determines the ability to save and the level of capital income. In the following the stress is laid upon the relation in between the education level and accumulation of capital. For the following empirical analyses the data file of the German household budget survey 1998[15] is used. As in the analyses above the data are restricted to West Germany and divided into three age cohorts: head of household younger than 40 years, in between 40 and 59 years and above 59 years. The number of the education levels under consideration is equal to the statistic used above but the definitions are different: (1) no occupational education, (2) semi-skilled or traineeship, (3) completed occupational education, (4) master or occupational academy, (5) graduate from a university of applied science, (6) graduate from a university.

In figure 13 the expenses for capital formation are visualised. Private households, in which at least one household member has a university degree, spend the highest amount for capital formation, the second highest amount is spend by households with a graduate from universities of applied science. The median values demonstrate that the variance within the groups is quite high. Additionally it is obvious that the households with older heads do spend more of their income for capital formation than the younger households; in the first cohort at the begin of the working career other expenses like costs for founding a family and raising children, arranging a flat, expenses for durable consumption goods, etc. are dominating.

[15] The German Einkommens- und Verbrauchsstichprobe (EVS) is a household budget survey for the net income and consumption levels, including the property and wealth, within the private households. It is a sample of 0.2 % of all private households and has even quite a good quality regarding the corresponding national accounts statistics. For details see http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Content/Publikationen/Qualitaetsberichte/WirtschaftsrechnungenZeitbudget/WirtschaftsrechnEVS,property=file.pdf. For a comparison with other statistics see Bork/Petersen (1997).

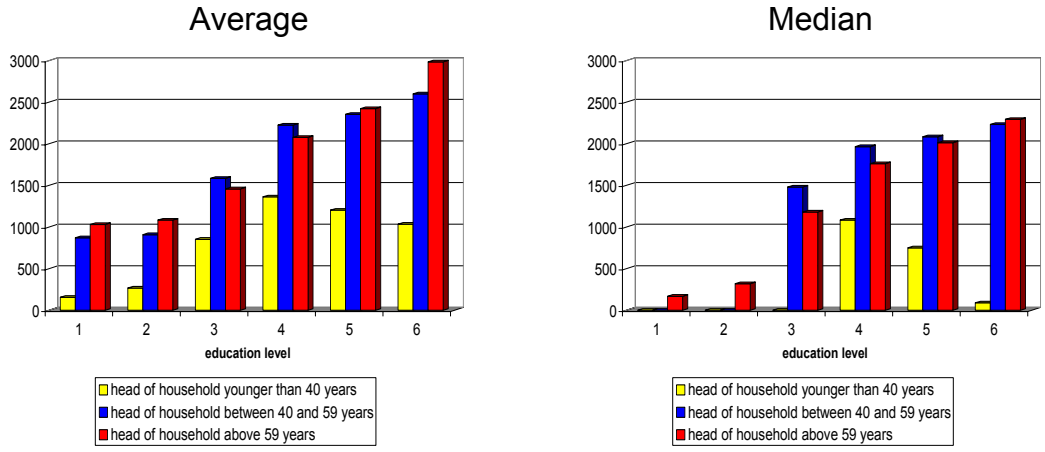
Figure 13: Expenses for Capital Formation of Private Households According to Age Cohorts and Educational Level per Quarter, West Germany (Euro)



Source: EVS-Data File 1998, own calculations.

Needless to say, that the differences in savings also determine the extent of capital income within the different private households. Consequently the younger households have less capital income than the older ones (see figure 14). It also becomes obvious that within the households of the youngest cohort not the highest education levels do have the highest capital income but the education level 4. This is caused by the fact that the expenses for capital formation in these education levels are higher but the accumulated capital is less due to the later entry into the working life. In the second and third age cohort this later entry is already overcompensated by the higher periodical savings.

Figure 14: Capital Income of Private Households According to Age Cohorts and Educational Level per Quarter, West Germany (Euro)



Source: EVS-Data File 1998, own calculations.

The medians in figure 14 also show that for the lowest qualification levels capital income does not play an important role. In contrast, households with academic persons have capital income of a quite remarkable extent. Therefore, capital formation and capital income are closely related to the education levels and have to be included

into the analysis if all the merits of higher education have to be taken into consideration.

V. Conclusion

The paper has shed some light on the education returns of higher education at least for one cohort (entering the labour markets at the end of the 50ties, being retired in 2004) in the post war period in Germany. Because of the maturity of the German economic system and partial saturation in demands for standard commodities the same growth patterns as in the past cannot be projected for the future. But in a world of increasing competition because of an onward going globalisation it seems to be likely that high qualified human capital is for Germany the only remaining resource to keep up with the international developments. Therefore, it is more than likely that the education returns will not be strongly reduced in spite of the fact that the future lifecycles will be much less stable, more volatile, and more often interrupted by job rotation as well as temporary unemployment.

Regarding the methodological approaches of our empirical analysis some important questions remain: Which comparisons are the correct ones, using the raw or discounted data, using the method to discount on the entry in retirement or discounting on the time of the decision on the different education qualities? The latter method would be to determine the present value of the human capital or to estimate the internal interest rate. Which method is ever chosen, the estimations of the education return above have made quite clear that higher education renders a remarkable income advantage, which might justify that the students (or their families) should directly contribute to their education costs, even to make quite clear that such costs are involved and to prevent them from doing wrong decisions with regard to their future working life.

The estimations have also shown that the income tax progression reduces to a certain extent the income advantages of higher education. Vertical equity is directed to reduce income differences due to the ability-to-pay-principle but not to pay for specific public or merit goods. If we take the undiscounted net wage differences (see table 2 and 3 above) then a male graduated form a university (university of applied science) has an advantage of 102,684 Euros (129,659 Euros); for a female graduate the numbers are 65,640 Euro and 34,031 Euro respectively, all compared to the education level with abitur and completed occupational education. If we take the current study fees in some German states, which are about 5,000 Euro for a five years study program, at least for an average student (family) such burden is obviously bearable.

But these fundamental breach in the development patterns is likely only the first step into financing tertiary education more directly; and even currently we have to take into consideration that the participation in higher education programs of young people from the lower income groups is every thing else than satisfactory. During the last three decades the participation ratios have even been decreasing.[16] Therefore the current programs of the single states to improve the conditions for students from low income families by introducing loan default funds without introducing reliable credit systems are far away from any efficient solution. Securing a high quality of human

[16] For details see http://www.studentenwerke.de/pdf/aeusserung_hrg_8_12_2003.pdf.

capital in Germany is not only a task for the states but also for the federation. While the most existing credit programs include interest and amortisation, such burdens might have a discouraging effect on students form low income families. Therefore a target orientated income contingent loan program for this group of students organised by the federation could be the silver bullet to overcome the current malaise. If like in Australia such a higher education contribution scheme would be interest free and additionally targeted to students from the low income groups, then the social selection effects can be almost avoided. Apart from that some problems remain: Postponed financing of tuition fees increase the marginal burdens for young people, which are already currently enormously high in Germany. And this marginal burden increase takes place in a period of life where the decisions for forming a family and parenting are made, thus perhaps even worsening the income positions of young families with all the negative impacts on future demographic developments. Educational policy as well as tax and social policy often are antagonistic – politicians have an uneasy job and will have a much harder job in the future to find majorities for one ore the other political alternative, which explains that our traditional systems have become more and more rigid.

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Chapter 6:

Social Policy, Higher Education and Environmental Economics

6.1.

World Crisis in Social Security: West Germany

Co-author Karl Heinz Jüttemeier

(Jean-Jacques Rosa (Ed): World Crisis in Social Security, Paris, San Francisco 1982, pp 181 – 205)

6.2.

Gloomy Prospects for Social Retirement Insurance - An International Phenomenon

Co-author Karl Heinz Jüttemeier

(Intereconomics, Hamburg, Vol. 18 (1983), pp 11 – 17)

6.3.

International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care. Comment on Richard M. Scheffler

(Herbert Giersch (Ed): Reforming the Welfare State, Berlin et al. 1997, pp 261 - 266)

6.4.

Systemic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond

(Case Doradcy Sp. z o.o., Forum Ochrony Zdrowia. Warsaw 2004, pp 1 – 26, in Polish Language)

6.5.

Education Return and Financing: Donated Affluence as Consequence of Tuition Free Study Programs in Germany

(Finanzwissenschaftliche Diskussionsbeiträge Nr. 55, Potsdam 2007)

6.6.

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation

(Ecohydrology & Hydrobiology, Warsaw, Vol. 1 (2001), pp 46 – 58)

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation[1]

by

Hans-Georg Petersen

I. Introduction

The task of writing a reliable and convincing paper on this topic is a very uneasy one because it is threefold: one has to know at least a bit about the agricultural sector, biology (or more precisely ecology), and about the sometimes beneficial but often distorting consequences of human activities. And all that has to be judged from the perspective of an economist who is aware of the steadily increasing uncertainties which are closely connected with post-modern sciences. Especially with regard to global, but also regional environmental issues, neither the conventional applied sciences nor the traditional professional consultancy deliver promising results. Today scientists have to tackle problems which are created by political necessities overwhelmingly caused by short-term human behavior, due in part to a serious lack of information on the long-term behavioral consequences. In these issues, typically, information stacks are high, scientific facts uncertain, individual as well as collective values disputed, and political decisions very urgent. „In general, the post-normal situation is one where the traditional opposition of 'hard'

[1] Invited lecture at the UNESCO MAB International Symposium „Fish and Land/Water Ecotones", May 22 - 24, Zakopane, Poland. Jointly organized by UNESCO MAB (MAN AND THE BIOSPHERE), Polish MAB National Committee (Section 5: „Aquatic Ecosystems"), University of Lodz.

facts and 'soft' values is inverted. Here we find decisions that are 'hard' in every sense, for which the scientific inputs are irremediably 'soft'" (FUNTOWICZ/RAVETZ, 1991, p. 138).

This is the typical situation in which traditional experts and specialists have lost confidence in the sciences as well as in the public because the best politicians do not have expertise in choosing experts. The only precautionary measure at the current level of knowledge is to broaden the information by adding generalists into decision process and to work on an interdisciplinary level. On the one hand, we are suffering from irremediable uncertainties in knowledge and moral uncertainties which often are much more difficult to deal with. On the other hand, ecologists and economists are confronted with the challenge of formulating conditions for a sustainable development to secure the survival of our „spaceship earth" (BOULDING 1973). Scarcity in knowledge and moral values are often connected with confrontation and hard social discourse; in workable democracies such discourses are basically necessary, but sooner or later they have to lead to cooperative solutions. Only open and cooperative societies, in which moral values are always in dispute and not bound by ideology, will be able to meet the call of realizing sustainability.[1]

The following explanations are divided into four parts; in chapter II. the problems of mainstream economics, the current land use system - especially with regard to our industrialized agricultural sector - as well as the natural resource scarcity are discussed and put into the broader perspective of a regional sustainable development which is one main topic of ecological economics.[2] In the next step (chapter III.) land and water ecotones conservation[3] is described as a substantial part of the idea of an integrated agro-industrial ecosystem which is able to reduce energy input and pollution (by avoidance of non-recycled residues), and to prevent the depletion of exhaustible resources. Chapter IV. deals with concrete strategies for an agricultural policy which is much more in accordance with today's economical and ecological goals while in chapter V. the consequences for the Polish economy are discussed. Chapter VI. presents a short summary and some political conclusions of our „soft" analysis.

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[1] For a detailed discussion of the value system of the open society see PETERSEN (1993).

[2] A comprehensive definition of ecological economics is given by ZUCHETTO (1991, p. 417): „the careful and deliberate understanding of activity on the earth and its consequences, with the ultimate goal being that humans will somehow manage this activity for the long-term survival of itself and other life on earth." For a detailed comparison of ecological economics with conventional economics and conventional ecology see COSTANZA/DALY/BARTHOLOMEW (1991).

[3] Ecotones are buffering strips in between different landscapes or habitats (e.g., edge of the forest, hedges, shores, banks) where the species richness is often much higher than in the surrounding landscapes (see SCHAEFER 1992, p. 232). For a detailed analysis of land/water ecotones see SCHIEMER/ZALEWSKI (1992) and ZALEWSKI et. al. (1994).

II. Some Theoretical Presuppositions for a Regional Sustainable Development

In classical economics - especially in the writings of Ricardo and Malthus - arable land and natural resources were regarded as scarce inputs into the agricultural and industrial production processes, so that nature itself was a primary constraint to economic expansion. Therefore, economics earned the title of the „dismal science". Perhaps because in industrial countries Malthus law[1] seemed to be falsified by technical progress and strong economic growth, in neoclassical economics the influence of decreasing soil quality as a consequence of expanded agricultural production and the depletion of non-renewable resources have played only a minor role or were often totally neglected.[2] Most of the neoclassical models are merely arguing with two primary inputs: labor and capital. Both are often put in simple Cobb/Douglas-production-functions which mathematically are easy to handle. Therefore it is not surprising that for many economists the driving forces of economic growth and the connected societal welfare are a highly qualified human capital and a sufficient capital formation. Thus economic growth is caused exclusively by increases in labor and capital productivity, whereas technical progress plays a role as an exogenous factor which cannot be explained but „falls like manna from heaven". The only constraints for economic growth are capital and/or labor shortages. Hence, the economy is a closed and self-perpetuating system which is totally independent from nature.

With regard to the theory and history of economic thought it is obvious that this position is an extreme one and - hopefully - only shared by a minority of existing economists. However, this extreme position has determined the regrettably bad reputation of economics and economists with the colleagues from the „other sciences".3 With the fundamentals of classical economists in mind the vast majority of economists should easily agree that not labor and capital, but low entropy energy and matter are the only primary factors of production. From a biophysical view both „... cannot be physically produced inside the economic system" (CLEVELAND 1991, p. 294). In opposition to the neoclassical view labor and capital as well as technology and technological change are internal, interdependent, and intermediate factors of production and the economic system (see COSTANZA 1980; HALL et. al. 1986). „The services of labor and capital and certain properties of land (i.e., soil fertility) are produced from low entropy energy-matter" (CLEVELAND 1991, p. 294)[4].

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[1] In short this law states that the food production is increasing in an arithmetic progression, whereas the population is increasing in a geometric progression (or exponentially); the result is an excess demand for food which leads to mass misery, epidemics, disease, and wars („repressive checks"), all causing a rise in mortality; see MALTHUS (1826/1912).

[2] This is especially true since HOTELLING (1931) had developed the theory of optimal resource depletion.

[3] Some more or less convincing arguments are even made by distinguished economists; see, e.g., AARON (1994).

[4] The approach of „evolutionary economics" which has been developed in the last two decades supports such views; here the close connection between biology and economics are to be mentioned, demonstrated by the corresponding terms mutation and innovation, heredity and imitation, genes and

Technological change is also in large part dependent on energy-input, though a tight positive correlation between energy flow, technical progress, production, and economic growth does not exist. If we take the development within the industrialized countries since the late 1960's into account, it becomes obvious that the close correlation of increasing energy input and real economic growth has been reversed. As a result of a progress in energy saving technology real growth has taken place even at decreasing energy input - a fact which is often neglected by colleagues from the natural sciences. However, in looking at the long-term trends in the development of the energy cost of extractive output for natural resources, a biophysical approach clearly supports the fact that increasing scarcities especially for metals and fossil fuel (coal and petroleum) are to be observed. Additionally, the enormous rise of capital and labor productivity in this century is very closely connected with an increase of fossil energy input which is especially true with regard to the agricultural sector. Briefly expressed, the use of more energy has directly and indirectly subsidized the efforts of labor. „As a result, labor costs declined while energy costs increased sharply" (CLEVELAND, 1991, p. 314).

Declining quality of non-fuel resources leads to a higher input of fuel-resources, so that the depletion of the latter is even accelerated, thus itself leading to a further increase of the energy costs of fossil fuels. Therefore our first and basic hypothesis for the further argumentation is that fossil fuels will become scarce which in turn induces increasing energy prices and consequently gives strong economical incentives to reduce the energy input of the production processes. The shortage in energy supply may partly be mitigated by the use of fusion reactors, but at the current pace of development this technology will not reach practical maturity before the end of the next century. Our hypothesis is also supported by the external effects which are technically connected with fossil energy use. All of the new global environmental issues are more or less due to fossil energy input: global warming, acid rain, ozone layer reduction, climate changes, etc. Although the current state of knowledge is - as already mentioned above - highly uncertain and many computer simulation models are following the GIGO-principle,[1] ethical thinking and our responsibility towards future generations obliges us to follow the precautionary principle which is fundamental for a sustainable development.[2]

It is self-evident that these basic global issues are enormously important for a regional sustainability, especially in developing a sustainable regional policy perspective. Fortunately, on the one hand, regional environmental problems are gradually easier to define and to manage; this is especially true in the cases of soil and water pollution, whereas the third environmental media,

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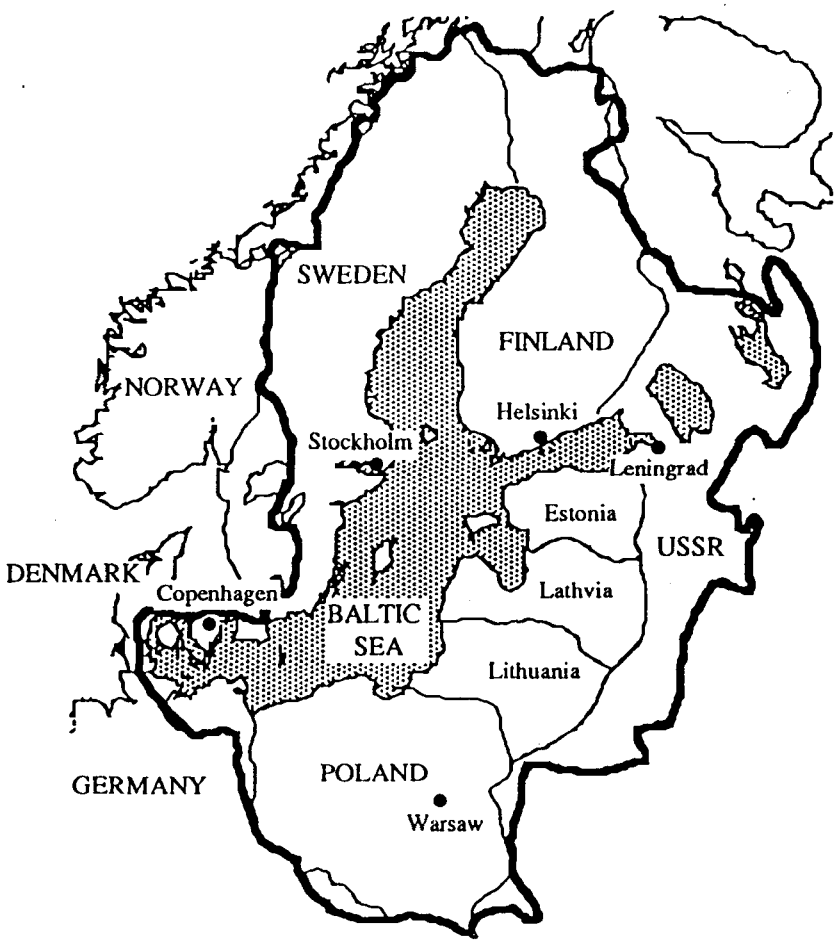
routines, selection and competition; see for more details NELSON/WINTER (1982), DOSI (1988), PETERSEN (1993, pp. 16).

[1] "Garbage In, Garbage Out"; see FUNTOWICZ/RAVETZ (1991, p. 140).

[2] This principle is described in detail in PERRINGS (1991). The following quotation gives a short summary: „A common thread in the various interpretations of sustainable development in the wake of the Brundtland report is the necessity to preserve the options available for future generations. Intergenerational equity, in this view, will be satisfied if the activities of the present generation do not impose irreversible costs on future generations" (p. 165).

the air, is partly regionally, and partly globally polluted. In the following we will lay stress upon soil and water, therefore neglecting the problem of air pollution (including acid rain). On the other hand, the boundaries of the polluted regions are normally not in accordance with those of the regional and local governmental jurisdictions; hence, political and legal boundaries only seldom coincide with the natural ones. If we take the Baltic Sea as an example, the catchment area - its „ecological boundary" - represents 15 percent of the European area which is about four times larger than the sea itself (see JANSSON 1991, pp. 450). This area covers parts of 9 Northern European countries (excluding Norway), and in the federal states even the regional or local governments have much political influence (see figure 1). Especially the boundary zones between the ecosystems (the ecotones) have attracted human beings because they have forever provided natural resources and services. This is true for the sea shores and the river banks which have always been the channels along which the human production processes took place. Nearly all capitals of the Baltic states are closely situated on the seaside. More than 70 mio. people live in the drainage basin of the Baltic Sea which „ ... provides the ultimate sink for the by-products of human activities in this land area" (JANSSON 1991, p. 452).

Figure 1: The Baltic Drainage Basin



Source: JANSSON (1991, p. 451).

All this points to the necessity of international and interregional cooperation, burden sharing, and fiscal equalization. The prerequisites are clearly formulated international and interregional environmental (or pollution) standards and a diagnosis of the polluting sources within the regions. This is - as long experiences have shown - even in a national perspective politically very hard work because of unhomogenous preference systems and different collective as well as individual interests. Whereas the general reduction of fossil energy inputs into the human production process will conserve resources and remedy global issues, regional and local responsibilities have to be directed to the task of securing environmental quality and species diversity.[1] Industrialization and the change from an almost closed farm economy in the agricultural sector to what is called bio-industry have been connected with tremendous negative external effects. „The population growth and economic expansion involved a major change in land use, resulting in the nearly complete disappearance of wild lands and natural forests" (BRAAT/STEETSKAMP 1991, p. 285). The major regional environmental risks turned out to be: soil erosion and pollution, nitrate and pesticide pollution of groundwater aquifers, surfacewater pollution by industrial and agricultural production as well as waste water from households and rubbish dumps, depletion of groundwater reserves, and loss of forest and wild land as productive and recreational subsystems.

The present and future quality of life heavily depends on a healthy environment and a sufficient biodiversity. Today's existing environment is much more determined by culture than by nature with enormous consequences for the composition and diversity of species. The everlasting evolutionary process has always been connected with natural or genetic selection. Under anthropological influences the process of natural selection has then been accompanied by a process of „cultural selection" (PETERSEN 1993, p. 188). As a result plants and animals are driven to extinction. During the last hundred years their rate of extinction has increased to be nearly that of the rate of human population growth (see MARKL 1991, p. 321). Because of a rising consciousness among a large part of the population in the industrialized countries, the costs of economic expansion are now newly evaluated. Therefore our second basic hypothesis for our further argumentation is that environmental quality and biodiversity of regions be evaluated as superior goods, which means that both are much more in demand the higher the income is within that region. Only environmentally healthy regions will attract innovative people and successfully survive international and interregional competition.

If our basic diagnosis of regional ecological problems is shared, then a frequent but very general therapy can also be delivered: „A growing group of thinkers from various disciplines is converging on the same overall vision: a globe with thousands of locally managed, self-reliant economies, based on ecologically meaningful boundaries and comprising culturally and

[1] The World Commissions on Environment and Development (WCED) defines the process of sustainable economic development as conservation of resources, environmental quality and species diversity; see WCED (1987).

historically integrated communities. The goal is to strengthen meaningful participation in a shared community while creating identification with the communally managed local resource base. Reestablishing and expanding traditional communal systems could help them regain community bonding while ensuring sustainable development" (CLARK 1991, p. 413). „Small is beautiful" is a formula which is not only beloved by economists; if one takes both of our basic hypotheses seriously, natural and social sciences have to develop technological strategies which are based on a „partnership with nature" (ODUM 1971). Such ecological engineering is the core of evolutionary multidisciplinary research and education (see ZUCHETTO 1991). „It is the prescriptive rather than descriptive discipline of ecology in that it utilizes ecological principles, the self-design or self-organizational capabilities of natural ecosystems, and the sustainability of solar based ecosystems rather than fossil fuel based technologies to achieve environmental quality" (MITSCH 1991, p. 428). In the following chapter we try to give a more concrete elucidation for the agricultural sector.

III. Towards an Integrated Agro-industrial Ecosystem[1]

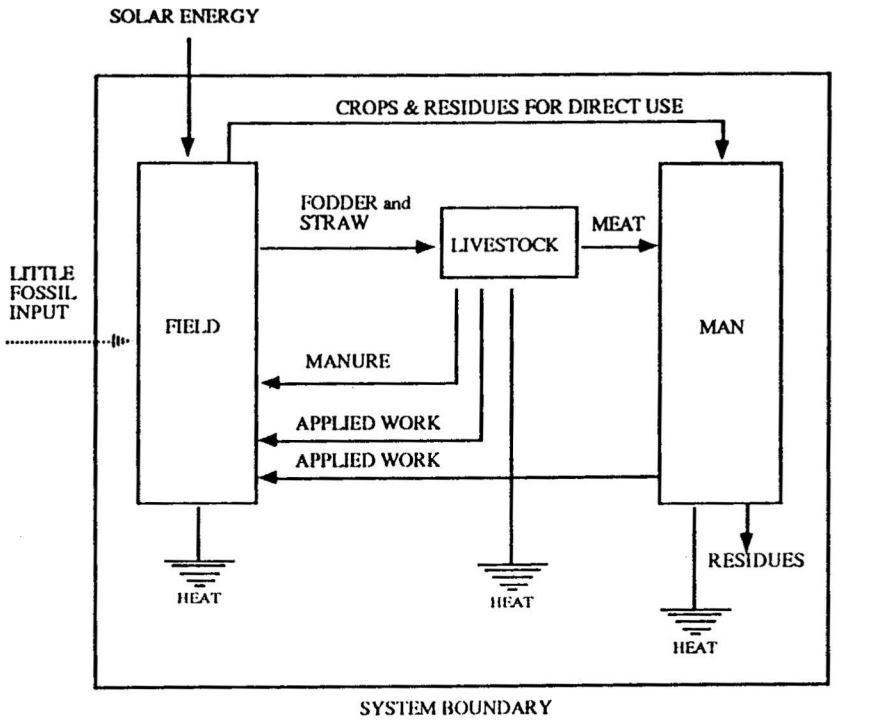
Historical perspectives are especially helpful for the understanding of ecological problems. If we consider, for example, the production method of a non-industrialized agricultural system we will find it very close to a natural ecosystem which is itself integrated and in a steady state (in German a bit more precisely: Fließgleichgewicht). „The system remains constant in its composition, in spite of continuous irreversible processes, import and export, building up and breaking down, taking place" (BERTALANFFY 1968, p. 142). Such a semi-natural ecosystem is based on networks of links so that the residues of some living species are the substrates for the others. „This gives a triple result: 1. Each species finds its primary material and the energy necessary for its development. 2. The residues produced by a species do not accumulate. 3. A continuous cycle of primary elements (carbon, nitrogen, oxygen, etc.) and trace elements is created so that they do not become immobilized in stable structures" (TIEZZI/MARCHETTINI/ULGIATI 1991, S. 461). The authors point out the fact that such natural ecosystems extend the cogeneration, which for instance exists for electricity and heat to all elements within the system, with the result that solar energy conversion is maximized.

Therefore the production process in subsistence agriculture, as shown in a system-theoretical approach in figure 2, overwhelmingly uses inputs of human and animal muscular energy, apart from the solar energy input. The input of fossil fuel is negligibly low, while the system is characterized by a process of natural recycling of nearly all residues. As a consequence the environmental pollution is also minimized. Such a system relies upon a high diversification of

[1] An excellent and detailed description is given in TIEZZI/MARCHETTINI/ULGIATI (1991).

agrarian products because of the necessity of crop rotation as well as the cogeneration of crop and livestock production, then the former is heavily dependent on manure production within the latter. Unfortunately, the labor productivity as well as the capital input is extremely low, so that the method of traditional agricultural production was and is not able to provide enough food for the use of an exponentially growing world population.

Figure 2: Traditional Farming



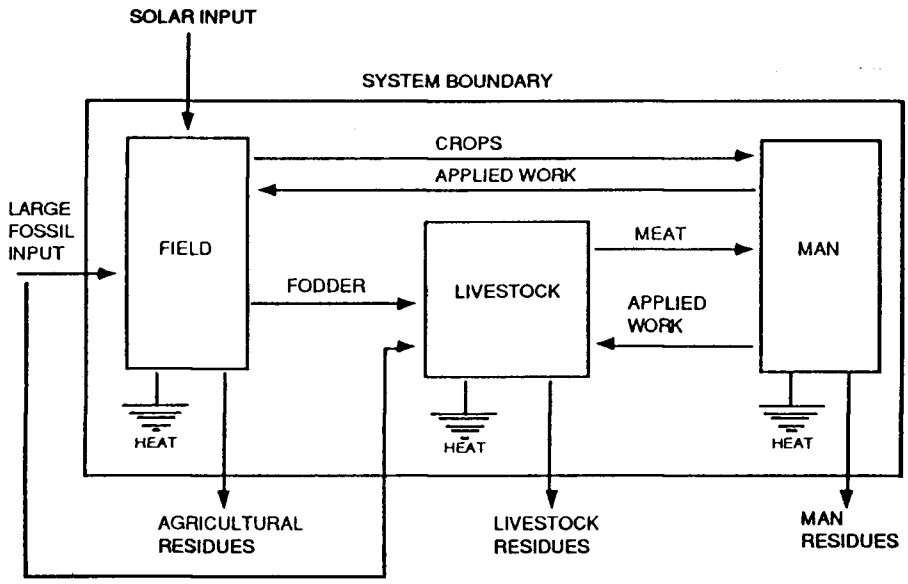
Source: TIEZZI/MARCHETTINI/ULGIATI (1991, p. 463).

Consequently, the methods developed for industrialized production - division of labor and specialization, capital formation, and high fossil energy input - were extended to the agricultural sector with a certain time lag. But the „... transition from preindustrial cogeneration to specialization was short and fast" (TIEZZI/MARCHETTINI/ULGIATI 1991, p. 459). Human and animal muscle power were substituted by agrarian high technology connected with enormous increases in fossil fuel inputs; the process of specialization has replaced crop rotation and also promoted the formation of pure crop and livestock producers - the already mentioned monocultural bio-industry. Returning to our system-theoretical approach, the conditions of a steady state are fundamentally changed or nearly destroyed. For the system tends towards a new steady state or towards the death of the system. A steady state as well as a stable equilibrium

work as systemic attractors;[1] weak disturbances can be compensated within the system, strong disturbances might cause catastrophes.[2] To prevent such developments a large number of counter-measures were necessary, all more or less connected with overwhelmingly unintended by-products.

In addition to the enormous increase of fossil fuel inputs, and because of the absence of internal stabilizing factors, many external systemic stabilizers - themselves heavily dependent on large fossil fuel inputs (e.g., large parts of the chemical industry) - became necessary such as artificial fertilizers, herbicides, pesticides, fungicides, artificial irrigation systems, etc. And monocultural production, especially the division of crop and livestock production, has often destroyed the process of residues recycling, so that greatly increasing amounts of agricultural, livestock and human residues have to be managed, which again is connected with increasing fossil fuel input (see figure 3).

Figure 3: Industrialized Agriculture



Source: TIEZZI/MARCHETTINI/ULGIATI (1991, p. 465).

The method of bio-industrialized production is therefore closely connected with the pollution of soil and water. The monocultures on the fields and the lack of soil covering during the vegetation-free periods as well as the deep-ploughing methods lead to soil erosion, while the excess input of artificial fertilizer and pesticides impair the soil, surface-, and groundwater

[1] For different kinds of attractors see, e.g., FEIGENBAUM (1980), RUELLE (1980), SCHAFFER/KOT (1985).

[2] For examples of possible catastrophes see, e.g., ODUM (1991), WALTER/BRECKLE (1991).

quality. Modern stable technology leads to much more liquid manure than in the traditional litter stables, thus producing a serious lack of organic dung and compost which again is compensated for by the input of artificial fertilizers. Liquid manure has mostly a waste water quality and in livestock production the connected land is often exclusively used as a manure dump, where the manure is directly or indirectly (by rainfall) transported to the groundwater or by ditches and creeks to the next drinking-water reservoir. Especially in rural areas with high livestock production the agricultural sector has become the main source of water pollution, whereas for example in Germany this sector contributes on average only about 25 per cent to water pollution.[1] And - last but not least - the current methods of mass livestock production are closely connected with the ethical questions concerning a species oriented livestocking, which is also important if one follows an anthropological and not purely biocentric world view.[2] Livestocking on a massive scale in inappropriate stables and cages (e.g., in the hen-houses, but also in pigsties and other cattle stables) creates not only ethical problems, but also lays serious social stress on the animals, with consequences for the quality of the product and the potential for dangerous developments with regard to new cattle-plagues, epidemics, and diseases which also might endanger human health (as in the case of the rinderpest).

Besides an increasing scarcity in fossil fuels, the sufficient production of clean drinking water will be another dominant problem of the next century in securing the survival of mankind on earth. And here again mankind is in a vicious circle: less and less clean water reserves are available as more energy input is needed to produce drinking water, which then in turn accelerates the depletion of fossil fuel resources. All this is reason enough to reformulate the role of the agrarian sector and the current land use concept: Away from monoculture, which is more or less exclusively bound to food production, to an approach which uses the cogenerative powers of the traditional production forms. Such a strategy does not mean the pure return to pre-industrial production forms because its low productivity would lead to shortfalls in food provision, especially in a global perspective. As is true in other areas of urgency, only strategies which are oriented to the future might help; new challenges can only be met by self-responsible adaptation of behavior and thinking, that is to say by reacting with scientific and technological change. „Who wishes our species well, is not able to avoid such conclusions. Who is of the opinion that a secured future is possible without permanent changes in our living conditions, without the uninterrupted pressure to new solutions, has not realized the rules of life“ (MARKL 1991, p. 218). In other words, mankind does not need less, but more and accelerated technical progress to overcome the current malaise.

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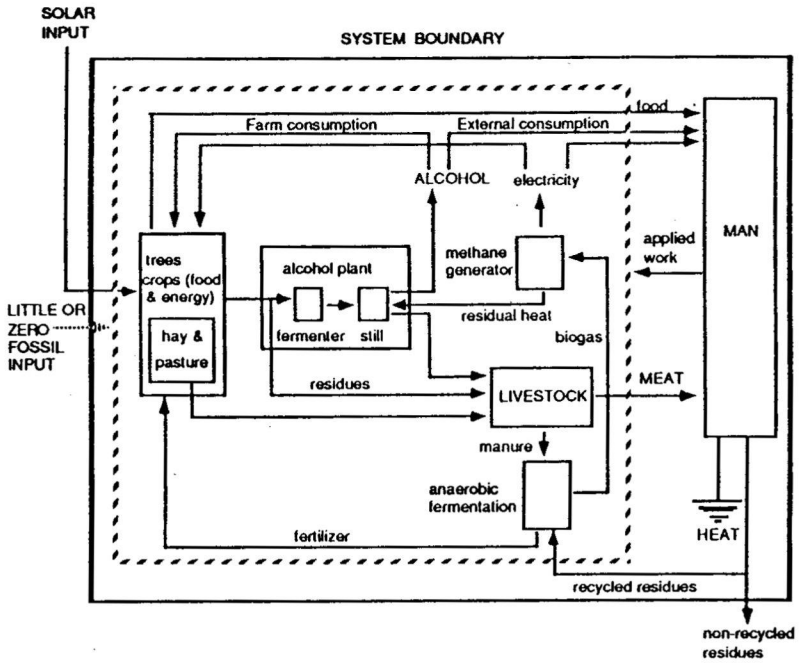
[1] The industrial sector is the main polluter with about 30 to 40 per cent, while the remainder is contributed by the household sector; see KLÖTZLI (1993, pp. 200).

[2] For more details see, e.g., WEIKARD (1992).

A future-oriented perspective for the agricultural sector is what Tiezzi, Marchinetti, and Ulgiati have named the integrated agro-industrial system, which uses the new scientific perceptions of ecology and economics and has been led by an interdisciplinary interchange to the „genesis of ecological economics“ (CLEVELAND 1991, p. 291) in combination with the traditional cogeneration of food and work sustained by solar energy flows. The modern cogenerative approach is a method of production in which not only food, but also energy and chemical products are manufactured. Hence, the spectrum of agricultural products is therefore expanded to products which are currently produced in the primary or industrial sector. Figure 4 shows such an integrated agro-industrial system where fossil fuel input is drastically decreased. As one important consequence, the contribution to atmospheric carbon dioxide is greatly reduced, therefore at least mitigating the greenhouse effect. This is especially true if the right scale has been chosen, so that the carrying capacity - which secures the ecological equilibrium within a region - is just reached.

Figure 4: Integrated Agro-industrial Ecosystem



Source: TIEZZI/MARCHETTINI/ULGIATI (1991, p. 467)

The basis of the agro-industrial approach is the method of biological or ecological farming (see, e.g., KLÖTZLI 1993, pp. 331) with crop rotation and species oriented livestock management; a certain specialization is still possible if the residues are overwhelmingly recycled. A change in

the stable technology would produce much more solid manure which is compostable and a good, if perhaps not total, substitute for artificial fertilizers. This reduces not only the fossil energy input, but also the eutrophication of all kinds of water. Excess manure connected with livestock production can be used in regional plants via anaerobic fermentation to produce biogas, and crop can be transformed by alcohol plants to ethanol. Both sources can be used as energy inputs for the farms, and it is very likely that the agricultural sector will be transformed from a net-energy consumer into a net-energy producer. A species oriented livestock management in which the number of animals per hectare is limited in a way that the risk of cattle-plagues are reduced and the product quality is increased would also decrease the infection risks to human society and therefore again lower the external costs.

From a microeconomic perspective it is obvious that ecological farming is more labor-intensive and at current prices more costly; but the stress has to be put on „current prices" which do not represent the social costs because the external costs which are connected with the current production methods are neglected (in energy as well as agricultural production).[1] From a macroeconomic point of view this outcome can vary greatly for the whole society or even mankind as a whole, dependent on the different normative evaluations made by the majorities in our democracies. The question as to whether ecological farming is profitable or not does not only depend on economic considerations, but is much more an ethical question which has to be discussed in the societal discourse.

In view of the future risks for the global system only a revolutionary change within our current land use systems will secure the survival of mankind on our spaceship earth. The integrated agro-industrial system is one positive contribution to regional and global solutions for a sound environment. Non-recycled residues especially would drastically be reduced. But even such a system which might not be much less productive than our current one will produce a certain excess of residues; unintended excess fertilization also seems to be unavoidable if only because of a lack of information and education. Therefore, the ecological land use system should be accompanied by a strategy of ecotones planning especially in countries where the population density allows a large-scale land use concept. Broad buffering strips along the sea shores and river banks would reduce the pollutant inflows and create a much more scenic landscape and the (re)construction of hedges and small forest would create habitats for beneficial animals, increase the species diversity and reduce the pesticides input.[2] A scenic landscape and a high biodiversity are facts which are tremendously important for the quality of human life. Especially a high biodiversity within the rivers can be supported by riparian ecotones and biomanipulation within

[1]Naturally the profitability of bio-products (as mentioned in the next chapter) is heavily dependent on the more or less administered prices of fossil fuel energy. The price for fuel oil for the purpose of energy production and house heating is, for instance, in Germany with 0.40 DM per liter much less than in Denmark (with 1.00 DM per liter). Therefore, in Denmark many more incentives are in place to substitute fossil fuels by renewable fuels.

[2]Convincing results have already been obtained in the change of management of the small stripes along the German road system which are also functioning like small ecotones.

lakes, rivers, and water reservoirs is a ingenious method to reduce the remaining pollutants to levels which are below strict environmental standards (see, e.g., ZALEWSKI et al. 1994).

As has been demonstrated, many new scientific ideas exist which foster an optimistic view that the current environmental problems will be overcome and future development secured. Today's real problem is to translate these ideas into political action. Therefore the following chapter is directed towards a strategy of agricultural policy which is - because of the need of integrated views - naturally very closely connected with some general political implications.

IV. A Workable Strategy for Agricultural Policy

An efficient agricultural policy is naturally part of an integrated ecological and economical policy program in which the polluters-pay-principle (or causative principle) and the precautionary principle already mentioned above are two cornerstones; the core of such an eco-economic program is the internalization of external burdens into the market price system (via eco-taxes, eco-subsidies, and eco-licenses) as well as the expansion of property rights especially with regard to important common property resources.[1] But as already has been mentioned, the role of the agricultural sector must also be substantially changed. If the numerous negative and few positive external effects are internalized, the relative prices will have been changed dramatically. Production technologies and many presently unprofitable or not sufficiently demanded products will therefore become of interest to producers and consumers.

The agricultural sector will gain in importance then not only as net-energy producer, but also as a sector which secures the clean drinking water supply and contributes to a highly habitable environment for everyone. Of significance is the fact that farmers could work for water protection and as landscape gardeners; both jobs would even justify a certain subsidization of the sector by the public budget. But the agricultural sector would become much more independent from the current flow of public subsidies because new goods would be produced which would also create a good chance for an increase in the number of the sectoral jobs.[2] The farm residues which under the monocultural regime were overwhelmingly turned into polluting wastes under the integrated regime now find their place as substrates for the production of ethanol, biogas, and

[1] Such measures are extensively discussed in nearly all modern textbooks of public economics and environmental economics; see, e.g., PETERSEN (1993a). For a detailed analysis of the eco-taxes see NAGEL (1993).

[2] It is obvious that some jobs in the energy sector and especially the chemical industry will become obsolete. The difficult question not easily answered is: does the total number of regional jobs increase or not. The answer is more heavily dependent on personal belief than on scientific knowledge.

other fuels produced out of renewable plant production.[1] „After the production of ethanol, it is possible to recover high protein feedstocks, and after the production of biogas there are residues with high fertilizer value. Thus, biomass processing plants, on an appropriate scale, are the core of the I.S. (integrated system, HGP); they introduce new 'trophic levels' and new feedback for the maximum exploitation of solar energy. Here, scale is key to reducing energy costs within the system" (TIEZZI/MARCHETTINI/ULGIATI 1991, p. 472). Even the combustion of biomass seems to be promising because the carbon dioxide balance is nearly neutral compared to fossil fuels, especially if the problems of smoke filtering and cleaning can be solved by newly developed „end of the pipe" technologies.

In addition to traditional food, new bio-energy, fertilizer and clean water production, agro-industrial plants will process fibers, chemicals and basic manufacturing materials. Linen and hemp production[2] could be intensified; hemp fibers especially are an excellent substitute for cellulose in paper production. Therefore, such a substitution strategy would simultaneously reduce the world-wide cellulose demand and the harvesting of rain forests of the equator and in the Northern hemisphere.[3] That would at least retard if not entirely stop the harvesting process and so decrease world-wide climate changes, and hence protect the existing species in those areas and secure a high biodiversity for the future. Assuming innovative thinking, openness towards new solutions, and individual as well as collective flexibility, many other positive examples for successful future-oriented strategies can be found in today's world, and a courageous eco-economical reform policy improving the framework of economic and societal order would set new positive signals.

But also with regard to the traditional spectrum of agricultural goods new approaches have to be developed; it is well known in the economic literature that the greater part of agricultural products have the characteristics of inferior goods. If within societies real income is increasing, the demand for basic foodstuff is increasing at a much slower rate or sometimes even decreasing. The low income elasticity of agrarian products is the main reason why the agricultural sector has decreased in importance during the growth process in industrial countries if sectoral incomes are measured either as percentages of the GNP or as the ratio of the labor force engaged in the agricultural sector to the total labor force. If this process of a shrinking agricultural sector is to be slowed down, or even stopped, and the income disparities between the agricultural and the other

[1] The most appropriate plants for biomass production are rapidly growing tree species, rape, and China reed (miscanthus sinensis). With the latter first experiments have been made in Northern Germany on fallow land; some problems were connected with high wind velocities which had a negative impact on the crop yield, so that a new breeding of better adapted species is necessary.

[2] Hemp production is currently extremely restricted because of drug policy imperatives. New hemp species will help to solve that problem.

[3] In British Columbia especially the virgin rain forests in large areas are harvested totally with an irreversible loss of biodiversity.

branches at least be reduced, farmers have to concentrate on the production of goods which show high income elasticities.[1]

In the Western economies, therefore, many farmers have specialized in tree-nursery and plant-cultivation because of the increasing demand of private house owners; but also the production of vegetables and fruit is often profitable, especially if the products have been grown by bio- or eco-methods. Nearly all agricultural goods stemming from a biological production are characterized by high income elasticities, and a large number of German consumers, naturally out of the higher income groups, are ready to pay much higher prices than for conventional products. In consequence, the profitability of eco-farms is often considerably higher than that of conventional ones, this in spite of lower labor productivity and higher costs - not to mention the psychological effects for the farmers, who become aware of working in partnership with nature and protecting their soils for the coming generations.

It is obvious that such specialization is heavily dependent on the areas where the single farms are situated; here the Thünen circles are mentioned which are concentric and show a decreasing intensity of soil production with increasing distance to the central spot of consumption. The importance of Thünen's theory has temporarily been neglected due to the improved infrastructure and transport systems. Transportation itself is connected with an enormous energy input and tremendous negative external effects, so that a reliable regional agricultural policy is significantly constrained by transportation considerations.

Other opportunities for farmers are involved in the production of renewable resources besides the above already mentioned, namely: wind energy. Productivity and profitability again depends on the geographical location and the connecting wind velocities. Reliable studies for Germany have shown that especially in the coastal areas on the North Sea and the Baltic the use of wind energy by modern wind mills can contribute up to 2 or 3 percent of the total electrical energy production (see MÜLLER 1992). In the meantime, even in the German highlands the first wind mill parks have been constructed and are profitably running, so that an optimistic forecast would lead to a share of wind energy which could come close to 5 percent within the next decade, with regional shares which are much higher. It is quite clear that in Southern European countries solar energy production is another challenge, but realistically (and hopefully!) not for Germany and Poland.

Dependent once again on the location, tourism has become an important and additional income source for a large part of the farmers; especially the ecotone concept which preserves or even

[1] And this rule is a general one for the total economic system which regrettably is overwhelmingly neglected as the enormous subsidies for „old" goods prove (e.g., coal mining, steel production, ship-building, agricultural production, etc., etc., etc.).

restores the virgin river near landscapes is favorable for the further development of recreational activities. The same is true for biomanipulation which increases biodiversity and makes an area much more interesting for people who like to enjoy „pure" nature, which is, and will remain, a scarce product characterized also by high income elasticities. And all these activities are important on a national and international level. Regional and international competitiveness is dependent on the evaluation of the quality of the goods which are supplied by the national and international consumers. We are often confronted with the opinion that environmental protection is connected with additional costs and that it impairs the competitive ability of regions or - even worse - is a serious competitive disadvantage. In our normative setting this is an extremely short-sighted view: if it is correct that without adaptations a serious energy crisis is ahead and irreversible environmental damages will occur, then those countries will survive which are marching at the head of the environmental movement. If we change the structures today, we will have induced technical progress and new productive structures just in time. Energy saving and non-polluting products (including technologies and machinery) will be highly competitive and serve as the base for future economic progress without impairing the chances of future generations. However, we all know people who ask, what have the future generations done for us. But is it ethical to ask this question?

The change from conventional to ecological farming would create many ecological and economical advantages. If increasing wealth is granted, bio-products are assured a future. Because of tremendous obstacles, especially political reservations and resistance, new marketing strategies are of utmost importance. Agricultural bio-products and „soft" tourism are promising goods which increase the ability to compete in the European and world markets. The less densely populated and low-wage countries especially have comparative advantages in such productions. What is needed is a modern organization of the agricultural sector and federations which, especially in Germany, are currently characterized by exaggerated conservatism and traditionalism - hence inflexibility and immobility regrettably do not only rule in our land! What is badly needed are not peasants who follow an ideology of „blood and soil", but farmers who have the abilities of Schumpetarian entrepreneurs and managers. And for the management of energy and other plants new forms of voluntary cooperatives have to be developed - all only possible if sufficient qualified human capital is available. An enormous task for the transfer of scientific knowledge and education on the different levels has arisen here.

V. Consequences in the Polish Example

For a short overview we will lay stress upon the employment structure and farm size, both being the most important components for a micro- as well as macroeconomic evaluation. In 1992 about 15 mio. people were employed in the Polish economy, and more than 4.1 mio. or 27.4 percent

were engaged in the agricultural sector, about 87 percent of them on privately owned land. This percentage is more than 9 times as high as in the United States, 6 times as high as in Germany, and even 2.5 as high as in Spain, the latter as an example of the less developed EU countries.[1] The contribution of the agricultural sector to GNP in Poland in the same year was 8.2 percent, which is 6.6 times as high as in Germany (old states), 2.7 times compared to France, and 2.1 times compared to Spain.[2] The average number of employees per 100 hectares is in Germany only 7.9, whereas in Poland 28 persons are employed. On highly specialized crop producing farms and under favorable natural and locational constraints, this number is in Germany often less than 2.

If one takes the German model, which has a comparatively modern conventional agricultural sector for the EU, the adaptation of the Polish sector would lead to a loss of 3.5 mio. jobs. The current number of unemployed persons would rise from about 2.5 to 6 mio. people, thus increasing the unemployment rate from 16.7 percent in 1994 (see BELKA/KRAJEWSKI 1995) to nearly 40 percent - really a catastrophic and unrealistic figure. Even the adaptation to the Spanish figures would destroy 2.5 mio. jobs. A very careful agricultural policy is necessary in order to mitigate the consequences for the employment situation. There are two reasons why a strategy to introduce ecological farming would make a lot of sense and substantially reduce the pressures of excess supply on the labor market, with all the connected individual (psychological as well as real) but also social costs of unemployment. Firstly, there are some reliable estimations which point to the fact that the labor intensity in ecological farming is between 25 to 100 percent higher than in conventional farming, dependent on farm size and type. Taking an average 50 percent and - in view of the average farm size - the more realistic adaptation to the Spanish situation, the unavoidable reduction in employment within the agricultural sector could be reduced to a loss of about 1.7 mio. jobs (or minus 11.4 percentage points). And as long as the wage costs in Poland are considerably less than in the EU, this decrease in the number of jobs could be reached in the course of a long transition period in which the generative change will substantially reduce the social costs, the pressure on the labor market, as well as serious political problems.

Secondly, one must consider the enormous differences in the technical equipment and the input of artificial fertilizers. Polish farms are much less equipped with machinery than is the case within the EU; therefore, a technological change would destroy much less investment and

[1] See SOWADA (1994, pp. 16); the numbers are for the USA 2.9 percent, Germany 4.2 percent, France 5.8 percent, and Spain 10.7 percent.

[2] The numbers are for Germany 1.25 percent, for France 3.06 percent, for Italy 3.28 percent, and for Spain 3.99 percent. The comparison of the two ratios makes it obvious that the rate of employed persons is much higher than the rate to the total GNP; this points to the above mentioned income disparity between the agricultural and the other sectors of the economies. The average income in the agricultural sector is therefore much lower, but it is also important to mention that the personal income distribution within the agricultural sector is much more uneven (or concentrated) than in the other sectors.

capital, increasing the acceptance of such a change. While in 1989/90 the input of artificial fertilizer was on an average European level, as a consequence of the „Big Bang"-crisis of 1990 to 1992 (see BELKA/PETERSEN 1995) and increasing prices (partly due to the adaptation to world market prices), this input was drastically reduced.[1] This reduction is already half the way to ecological production. A decrease in the demand for artificial fertilizer has therefore already taken place, partly connected with a corresponding loss of jobs within the chemical industry. This fact reduces the resistance of this sector and the relative prices favor the use of natural manure at least in the early transition period.

Another fact worth mentioning is the possibility that a large part of the farmers may be able to stay on their land and work at part-time jobs in the newly created agro-industrial plants and cooperatives; it is pure speculation to give a precise number, but some ten-thousand would be no exaggeration. Part-time farming is also popular in many states of Germany; and this perspective leads to the second, very serious Polish problem: the small farm size compared to the EU-average. Table 1 shows the farm size structure in different Polish regions and on the national average. Nearly 90 percent of the farms are clearly below the levels which are held as profitable within the EU.

Table 1: Farm Size Structure in the Private Agricultural Sector in Poland

		Number of farms	Farm size in hectar			
			1-5	5-10	10-15	> 15
Total	1988	4 584=100	40,8	31,1	16,9	11,2
	1992	4 333=100	42,9	29,0	16,6	12,6
Region Mid-west	1988	595=100	27,4	25,7	23,9	22,5
	1992	547=100	26,2	24,5	23,9	24,9
Region Central Pol.	1988	398=100	39,5	42,0	19,8	8,5
	1992	384=100	40,6	37,5	19,8	9,4
Region Warsaw	1988	593=100	45,4	36,9	23,4	7,8
	1992	566=100	43,4	35,3	23,0	8,0
Region Mid-east	1988	470=100	42,5	41,2	24,1	6,4
	1992	452=100	40,7	39,6	21,5	7,7
Region South-east	1988	1 139=100	66,6	29,2	4,1	0,1
	1992	1 107=100	67,4	27,8	3,7	1,1
Region South	1988	512=100	59,5	25,9	10,5	4,1
	1992	446=100	59,9	24,0	10,3	5,8
Region South-west	1988	318=100	30,2	34,5	16,7	18,6
	1992	306=100	30,4	28,4	20,3	20,9
Region North	1988	220=100	24,6	17,7	34,5	23,2
	1992	208=100	26,0	14,9	30,7	28,4
Region North-east	1988	339=100	15,6	23,3	24,5	36,6
	1992	317=100	14,5	21,5	22,4	41,6

Source: estimated from SZEMBERG (1993, p. 22). (übersetzen von Sowada AP)

[1] From 164 to 62 kilogram per hectare: phosphorous from 41 to 12, nitrogen from 69 to 34, carbonate from 54 to 16, and calcium from 182 to 117 kilogram. The influences on the crop yield are not yet very obvious (see SOWADA 1994, pp. 10).

Peasants work on 80 percent of the arable land, and 2.7 mio. farms exist. The average farm size was 6.3 hectares in 1992. Most of the farms (1.1 mio.) are less than 5 hectares and nearly all are used for full-time farming. It is not surprising that the average real income per capita is extremely low compared to EU standards. During the long-term transitional process mentioned above the farm size has to be increased substantially. This process has to be supported by agricultural policy. The conditions for land leasing have to be improved; the rational sale of land especially has to be organized because currently an enormous excess supply of arable land exists which reduces the land value. At such prices farmers feel expropriated and this impairs their readiness to sell. Therefore, arable land does not come into the most efficient and productive hands.

Another very serious obstacle exists which cannot be kept secret and could endanger the perspective given here. The EU agricultural price system should actually be in accordance with traditional, bio-industrial production methods, but has instead pressed the farmers of the member countries into a situation of ever increasing farm sizes and livestock keeping methods, and therefore to a large extend produced the polluting consequences of agricultural production. Therefore, it is questionable if our described strategy would be feasible if Poland were to join the EU very soon. European integration has had besides the indisputable positive effects of peace and wealth in Western Europe enormous negative external effects - the agricultural system is quite ridiculous and has to be totally reformed. But the resistance of all the interest groups involved has up to now always been successful. In view of these costs of integration, Poland and other countries of Mid and Eastern Europe should make some rational estimations as to whether this price is not too high.

VI. Summary and Some Political Conclusions

The last problem directly leads us to the question of why rational perspectives exist but are not transformed into practical political measures or reforms. It could be possible that our above stated normative positions are not shared by the majorities in our existing democracies, but it is my impression that that is not very likely. People with conservative values, those who are closely bound to distributive justice, intergenerational equity, or to biocentric world views together are in a majority position. If this is the case, then imperfect information and individual or collective illusions might be the reason, which can only be remedied by information policy and education. So-called personal or group interests are the main obstacles; because older generations are not informed about what today is called Modern Political Economy or public choice theory, they follow a romantic state theory approach in which the state and its institutions are always considered benevolent and much more efficient than other societal instruments (see PETERSEN 1995). In former times we have complained about market and even moral failures and increased

state interventions.[1] Nowadays governmental, political, bureaucratical, and even democratical failures are gradually surfacing in the consciousness of many individuals. The peaceful revolution in the former countries of realized socialism has contributed towards enlightenment even in the West. The spreading liberal ideas (in the sense of the European continental view) will help to overcome these political obstacles.

We are still confronted with ideological positions and even today a large number of colleagues from the natural sciences, philosophy, and especially Christian theology are of the opinion that economic science is a theory of greed, egocentricity, spite, evil and envy. Because economists deal with the problem of scarcity, which is a problem on earth and not in paradise, economists are far form heaven and bound to hell. Fortunately, an increasing number of scientists are once again working on a multidisciplinary level and have overcome old prejudices and the limits of their subject areas. The open minded have found a lot of interesting and helpful information on ecology and economics. Both present a large amount of possible counter-measures able to solve global as well as regional environmental problems. As an economist I want to point out the fact that markets, political-economic considerations, institutional economics, evolutionary economics - closely bound to biology[2] -, and last but not least ecological economics will contribute much. The very popular trade-off between economics and ecology has been falsified and will be falsified even more in the future.

Scientists must realize that specialization in science has also had negative external effects; the famous German expression „Fachidiot" has its validity. The solution of the pressing problems of the future requires that scientists free themselves from the „envy trap" in which they were caught. Natural sciences and social sciences without any philosophical basis can only be bad sciences. I would like to close this very general overview and guideline with the hope that a bit more universal orientation in the direction of Aristotle's view of the Unity of Sciences will gain in influence at our universities; the risks and uncertainties which are always involved in considerations of the future are much easier to be dealt with if we have an ethical foundation of scientific responsibility. Without the revival of many traditional values and the formulation of some new ones, that is to say a clear moral foundation, even the best diagnoses, therapies, biological and technical devices, and cost-benefit-analyses will fail.

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[1] For an efficient combination of the societal instruments (family, moral, law, and market) in Western style open societies see PETERSEN (1993).

[2] Perhaps this is one reason for Aaron's statement that the „... currently most exciting science of them all ..." (AARON 1994, p. 11) is biology.

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