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The Social Budget of Germany

ILO research project co-financed by the

German Federation of Trade Unions (Deutscher Gewerkschaftsbund, DGB)

and

Hans-Boeckler Foundation (Hans-Böckler-Stiftung, HBS), Germany

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Contents

List of abbreviations

ALG2	Arbeitslosengeld 2 [unemployment benefit paid to unemployed households in need, according to rules of social assistance]
BA	Bundesagentur für Arbeit [Federal Employment Agency; see UI]
BIP	Bruttoinlandsprodukt [GDP]
BMG	Bundesministerium für Gesundheit [Federal Ministry of Health], Germany
BMAS	Bundesministerium für Arbeit und Soziales [Federal Ministry of Labor and Social Affairs], Germany
BMFSFJ	Bundesministerium fuer Familie, Senioren, Frauen und Jugend [Federal Ministry for Family, Seniors, Women and Youth], Germany
CPI	Consumer price index
CPW	Continued payment of wages and salaries in case of sickness,
CSMBS	Civil servants medical benefit scheme (Beihilfe der Beamten)
DDD	Daily Defined Doses (pharmaceuticals)
DGB	Deutscher Gewerkschaftsbund [German Trade Union Federation], Berlin, Germany
DHV	Deutsche Hochschule für Verwaltungswissenschaften [German University of Administrative Sciences], Speyer, Germany
DRV-Bund	Deutsche Rentenversicherung - Bund [German Pension Insurance – Federation]
ESSPROSS	European System of Social Protection Statistics
EUROSTAT	Statistical Office of the European Union, Luxembourg
GDP	Gross Domestic Product
GKV	Gesetzliche Krankenversicherung [Statutory Health Insurance]
GRV	Gesetzliche Rentenversicherung [Social Pension Insurance]
HEC	Haute Ecole de Commerce, Universität Lausanne
HBS	Hans-Böckler-Stiftung [Hans-Böckler-Foundation], Düsseldorf, Germany
IAA	Internationales Arbeitsamt [International labour Office (ILO)], Genf, Schweiz
IAO	Internationale Arbeitsorganisation [International Labour Organisation (ILO)]

ILO-SEC/SOC	Social Security Department of the ILO [Abteilung Soziale Sicherung im IAA]
LTC	Long-term care [Pflege]
LTCI	Long-term care insurance [Pflegeversicherung]
NHA	National Health Accounts
PflV	Pflegeversicherung [Long-term care insurance, LTCI]
PHI	Private Health Insurance
SB	Sozialbudget [Social Budget]
SHI	Social Health Insurance [Gesetzliche Krankenversicherung]
SPI	Social Pension Insurance [Gesetzliche Rentenversicherung]
StBA	Statistisches Bundesamt [Federal Statistical Office], Germany
UI	Unemployment insurance [BA]

Foreword

The project underlying this report has a reason and a purpose.

The *reason* is rooted in the labour market and social policy reforms as initiated and carried out by the German federal government by the beginning of the decade. In this context the Deutscher Gewerkschaftsbund (DGB) [German Trade Union Federation] suggested that the Social Security Department of the ILO (ILO-SEC/SOC), Geneva, should assist them in calculating the long-term impacts of the reforms on Germany's social budget [Sozialbudget] and interprete these on the background of international experience.

ILO-SEC/SOC reacted positively to the suggestion not only in order to respond to the request of a constituent of the ILO but also to test the robustness of its model family in a country with complex and mature social legislation and high social expenditure. Thus far, it had mainly been applied to schemes of, and used as a basis for social policy advice of countries with emerging or partial social protection systems outside Western Europe. [1]

The project was entitled «An International Perspective for the Future Design of Germany's Social Protection System» and was financially supported by the DGB and the HBS. Contracts between the two institutions and ILO-SEC/SOC were signed in 2005.

First calculations focusing on Germany's civil servants pension scheme were undertaken by ILO-SEC/SOC in 2005; they were complemented in 2006 by research jointly undertaken with Ms Severine Gaille, assistant at the actuarial department of the Haute Ecole de Commerce (HEC), University Lausanne, which produced reasonable demographic results but clearly showed that a solid estimation of the financial impacts of the reforms in Germany could only be expected after tapping knowledge institutionally only available in Germany. Similar conclusions had to be drawn with respect to the appropriate modelling of the reforms in the social pension insurance (SPI; Gesetzliche Rentenversicherung), which would have required comprehensive changes in the programming of the standard pension model available at ILO-SEC/SOC. [2] In principle, this would have been possible but the respective works would have exceeded the required financial and human resources available at the time.

In order to avoid delays ILO-SEC/SOC contracted with Deutsche Rentenversicherung Bund (DRV – Bund), which kindly made available the expertise of Dr Heinrich Jess who undertook the required modelling work in the field of the statutory (social) pension insurance (SPI). With respect to the civil servants pension scheme ILO-SEC/SOC collaborated closely with Mr Harald Dalezios, Deutsche Hochschule für Verwaltungswissenschaften [German University of Administrative Sciences], Speyer, who made available free of charge the results of calculations undertaken with a model

[1] An important exemption is Luxembourg. However, the application of ILO-SEC/SOC's model family in 2001 was restricted to an evaluation of the long-term financial development of the pension scheme. See International Labour Office: *Évaluation actuarielle et financière du régime general d'assurance pension du Grand-Duché de Luxembourg*. Bureau international du Travail – Genève, 2001. (OIT/TF/Luxembourg/R.2.)

[2] See, for example: Plamondon, Pierre et. al.: Actuarial practice. *Actuarial practice in social security*. Quantitative Methods in Social Protection Series. International Labor Office / International Social Security Association, Geneva 2002.

developed in a separate research project - after adjusting these to the economic and demographic framework of the project underlying this report. [3]

With respect to modelling post-reform developments of the statutory (social) health insurance (SHI) and the statutory long-term care insurance (LTCI) ILO-SEC/SOC made use of core elements of a model that had been developed by Mr Thomas Renner, Federal Ministry of Health [Bundesministerium für Gesundheit (BMG)], Berlin, during several months of detachment to ILO-SEC/SOC in 2004; the model was partially re-programmed and adjusted to the requirements of this social budget project. We are grateful to Mr Renner for his support patiently provided in case of technical problems and for his help in helping ILO-SEC/SOC understand reformed SHI legislation such that it could be reasonably transformed into tangible modelling approaches.

The data of Germany's social budget (financial statistics) were made available by the Federal Ministry of Labour and Social Affairs [Bundesmininisterium für Arbeit und Soziales], Berlin; we are grateful to Mr Arne Kubitza, division *Sozialbudget*, for preparing the data according to our needs. [4]

ILO-SEC/SOC provided the demographic, labour market and economic frame for the calculations undertaken in all schemes and for the consistent compilation of all different results within the methodological and statistical context of Germany's social budget, including the results for those schemes calculated by ILO-SEC/SOC itself. Most of the respective works, including consistency checks of model links and preparation of results for publication, were carried out by Ms. Diana Ognyanova (MA) und Mr Gerrit Reininghaus (Diplom-Mathematiker; MA), both students at the Hertie School of Governance, Berlin. Thanks go to Mr Tian Chao Yang, student of actuarial sciences at HEC, University of Lausanne, for his patient and careful reading and re-reading, and pointing to errors, of early drafts of this report.

The fact, that several persons / institutions contributed results to the project required special care and emphasis in the setting of the exogenous demographic and economic assumptions underlying the calculations, and in stipulating their consistent application within the different modelling contexts.

Responsibility for the establishment of those exogenous assumptions lay solely with ILO-SEC/SOC; responsibility for the consistent and timely cooperation between all those participating lies with Mr Wolfgang Scholz (ILO-SEC/SOC); he wishes to express his gratitude for the fruitful and easy cooperation among all involved.

It is worth mentioning that, as far as known by ILO-SEC/SOC, this is the first attempt of calculating Germany's total social budget consistently over a full period of three generations, i.e. over about 70 years. Not the long time-horizon as such is important – rather it is the fact that this long period allows to draw conclusions with respect to certain aspects of *present* social legislation which would not be possible otherwise.

The Director-General of the ILO, Mr Juan Somavia, thanks all those participating in this complex undertaking for their productive, uncomplicated and really smooth collaboration, without which the results as communicated in this report would not have been achieved.

[3] Permission to cooperation with ILO-SEC/SOC was kindly given by Professor Gisela Färber, Chair, Public Sector Economics and Public Finance, at the Deutsche Hochschule für Verwaltungswissenschaften.

[4] Permission for collaboration with ILO-SEC/SOC was kindly given by Dr Roland Berntzen, chief, Referat Sozialbudget, BMAS.

The financial volumes of statutory pension insurance, health insurance, long-term care insurance, unemployment insurance and the civil servants pension scheme covers about 80 per cent of Germany's social budget. Respective modelling is partially based on complex programming aiming at maximum adequacy in incorporating the actual interdependencies within the social budget but also with its «outer world»; in the report we do not always succeed in avoiding more or less detailed description of the applied formal methods.

We have to point out the limitations of the modelling approach used. First, such limits are to be seen in the fact that in setting the long-term economic and demographic assumptions we do not touch upon possible direct or indirect implications for Germany's economy of internationally «big» topics like climate change, capacity limitations in energy production and probable future food and water supply shortages. We hope, however, that the scenario technique applied offers a certain bandwidth of possible future developments.

Second, interpretative limits of results are to be seen in the modelling of social assistance, which we were able to map only in a preliminary (summary) way. It is to be expected that the decrease in the pension replacement rate will in future result in pensioners' increased social assistance entitlements, the financial burden of which will have to be borne by the municipalities' budgets. A micro-simulation model, which could have mapped the distributional effects on household incomes, was not available for the purposes of this report.[5] Implicitly these points must be understood as upward pressure on the social expenditure ratio as calculated in this report. The implicit increase must be expected highest in the pessimistic scenario, lowest in the optimistic one. The overall additional effect should remain within the order of 1 to 2 points of GDP.

Third, we would like to point out that we deliberately disregarded modelling a further institution within the social budget covering the recently introduced (tax-subsidized) voluntary retirement savings scheme («*Riester*») as, based on Eurostat methodology, it is not clear as to whether the expected benefits must be included in social expenditure.

Finally, the applied modelling approach does *not*, in principle, withstand modelling of impacts on Germany's social budget of the current global financial crisis. There are basically two reasons why it was decided not to include specific crisis-related calculations: first, this report addresses long-term financial issues of Germany's social budget; the conclusions that can be drawn from this report are not overly sensitive to impacts of the present crisis as long as it can be assumed that it is short-term and not disastrous with respect to its impacts on the real economy; second, any crisis-induced effects can be considered captured fully or partially in our more pessimistic scenario calculations; to the extent that the crisis affects Germany's long-term economic development more negatively than foreseen in our pessimistic scenario some of our proposals regarding reform of financing Germany's social budget become more urgent.

[5] The data available at GRV do not yet allow for conclusions with respect to the number and structure of persons that might be entitled to social assistance because of the lowering of the pension replacement rate; even if entitled, it is unclear yet, how many of those might actually realize their entitlement as they might have alternative (additional) incomes (which are unknown); many of those retirees receiving social assistance today are not entitled to a pension, accordingly they are not being affected by the lowering of relative pension levels.

Vorwort

Das diesem Bericht zugrundeliegende Projekt hat einen äusseren Anlass und einen Forschungszweck.

Den äusseren Anlass bilden die zu Beginn dieses Jahrzehnts von der deutschen Bundesregierung angekündigten bzw. angestossenen Reformen im Bereich der Arbeitsmarkt- und Sozialpolitik. In diesem Zusammenhang suchte der Deutsche Gewerkschaftsbund (DGB) die Unterstützung der Sozialversicherungsabteilung des Internationalen Arbeitsamtes (IAA), Genf, - ILO-SEC/SOC - um langfristig zu erwartende Auswirkungen der Reformen auf das deutsche Sozialbudget zu berechnen und vor dem Hintergrund ihrer internationalen Erfahrung zu interpretieren.

Die Anregung wurde von ILO-SEC/SOC auch deswegen gerne aufgegriffen, da so nicht nur der Anfrage eines Mitglieds der IAO entsprochen werden konnte, sondern auch die Robustheit des bei ILO-SEC/SOC vorhandenen Modellierungsinstrumentariums, welches bislang überwiegend ausserhalb Westeuropas [6] zur sozialpolitischen Beratung eingesetzt worden war, in einem Land mit komplexer Sozialgesetzgebung, reicher statistischer Information und hohen Sozialausgaben zu testen.

Ein entsprechender Vertrag zwischen ILO-SEC/SOC, Genf, und dem Deutschen Gewerkschaftsbund (DGB), Berlin, sowie der Hans-Böckler-Stiftung (HBS), Düsseldorf, mit dem Arbeitstitel «An International Perspective for the Future Design of Germany's Social Protection System» kam 2005 zustande.

Erste, in den Jahren 2005 bei ILO-SEC/SOC - und 2006 zusammen mit Frau Severine Gaille vom aktuarischen Department der Haute Ecole de Commerce (HEC), Universität Lausanne - durchgeführte Modellierungen im Bereich der Beamtenversorgung ergaben plausible Ergebnisse, machten aber deutlich, dass eine solide Abschätzung aller finanziellen Auswirkungen der Reformen nur unter Rückgriff auf in Deutschland vorhandenes institutionelles Wissen würden sinnvoll durchgeführt werden können. Aehnliche Einschaetzungen ergaben sich wegen ihrer Komplexitaet bald auch für die Modellierung der Reformen der Gesetzlichen Rentenversicherung (GRV, [Social Pension Insurance (SPI)]), deren korrekte Abbildung umfangreiche Programmierungsarbeiten innerhalb der bei ILO-SEC/SOC vorhandenen Modellfamilie [7] erforderlich gemacht hätten. Dies ist grundsätzlich möglich, erschien aber wegen des zur Verfügung stehenden finanziellen und personellen Rahmens nicht angebracht.

Um groessere Verzögerungen zu vermeiden, schloss ILO-SEC/SOC einen Vertrag mit der Deutschen Rentenversicherung Bund (DRV – Bund), die freundlicherweise Herrn Dr Heinrich Jess für die notwendigen Modellierungsarbeiten im Bereich der Gesetzlichen Rentenversicherung zur Verfügung stellte. Für die Beamtenversorgung ergab sich ausserdem die Möglichkeit zur Zusammenarbeit mit Herrn Harald Dalezios von der Verwaltungshochschule Speyer, der die Ergebnisse seines im Zusammenhang mit einem

[6] Eine Ausnahme bildet Luxemburg. Allerdings wurde die dort 2001 durchgeführte Evaluierung auf Berechnungen der langfristigen Entwicklung des Rentensystems beschränkt. Vgl.: International Labour Office: *Évaluation actuarielle et financière du régime general d'assurance pension du Grand-Duché de Luxembourg*. Bureau international du Travail – Genève, 2001. (OIT/TF/Luxembourg/R.2.)

[7] Siehe z.B.: Plamondon, Pierre et. al.: Actuarial practice. *Actuarial practice in social security*. Quantitative Methods in Social Protection Series. International Labor Office / International Social Security Association, Geneva 2002.

Forschungsauftrag entwickelten Beamtenversorgungsmodells an die Fragestellungen dieses Berichts anpasste und der IAO unentgeltlich zur Verfügung stellte. [8]

Für gesetzliche Kranken- und Pflegeversicherung konnte bei ILO-SEC/SOC auf zentrale Teile eines Modells zurückgegriffen werden, das Herr ORR Thomas Renner vom Bundesministerium für Gesundheit (BMG), Berlin, während einer mehrmonatigen Abordnungszeit zur IAO im Jahre 2004 entwickelt hatte und dessen Programmierung für Zwecke dieses Projekts angepasst und aktualisiert wurde. Für die Klärung dabei auftretender technischer Detailfragen stand Herr Renner mit Rat und Tat zur Verfügung.

Die Daten des Sozialbudgets wurden vom Bundesministerium für Arbeit und Soziales (BMAS) zur Verfügung gestellt, und teilweise speziell für Zwecke dieses Berichts von Herrn RR Arne Kubitza vom Referat Sozialbudget aufbereitet. [9]

Die förmliche Zusammenführung der unterschiedlichen Ergebnisse mit dem von ILO-SEC/SOC bereitgestellten demographischen und makroökonomischen Modellierungsrahmen sowie mit weiteren von ILO-SEC/SOC bereitgestellten Ergebnissen, allfällige Konsistenzprüfungen und Aufbereitung für die Veröffentlichung wurden von Frau Diana Ognyanova (MA) und Herrn Diplom-Mathematiker Gerrit Reininghaus (MA), beide Studenten der Hertie School of Governance, Berlin, übernommen. Dank gilt Herrn Tian Chao Yang, der frühe Entwürfe der englischen Teile dieses Berichts geduldig auf Fehler und Unklarheiten durchforstete.

Die Tatsache, dass unterschiedliche Personen und Institutionen an diesem Projekt mitarbeiteten, erforderte, exogene demografische und ökonomische Eckwerte explizit vorzugeben sowie sicherzustellen, dass diese im jeweiligen Modellierungszusammenhang konsistent angewendet wurden.

Die Verantwortung für die Erstellung der Eckwerte lag dabei ausschliesslich bei ILO-SEC/SOC; die Verantwortung für die abgestimmte Zusammenarbeit aller Beteiligten lag bei Herrn Wolfgang Scholz (IAO, Genf), der sich hiermit bei allen für die fruchtbare und unkomplizierte Kooperation bedankt.

Es sei angemerkt, dass es sich nach Kenntnis der ILO um den ersten Versuch handelt, das deutsche Sozialbudget über einen Dreigenerationenzeitraum, also etwa 70 Jahre, weitgehend konsistent durchzurechnen. Die Länge des Zeithorizonts ist angesichts der zur Verfügung stehenden modernen Mittel natürlich kein besonderes Verdienst; erst sie lässt aber bestimmte Rückschlüsse auf den heutigen Stand der Sozialgesetzgebung zu, die sonst so nicht möglich wären, und auf die im Bericht an geeigneter Stelle hingewiesen wird.

Der Generaldirektor des IAA, Juan Somavia, dankt allen Beteiligten für die produktive, unkomplizierte und ausgesprochen reibunglose Kooperation, ohne die die Ergebnisse dieses Berichts nicht zustande gekommen wären.

Mit der interdependenten Modellierung von gesetzlicher Renten-, Kranken-, Pflege- und Arbeitslosenversicherung werden unter Einbindung der Beamtenversorgung etwa 80 Prozent des deutschen Sozialbudgets explizit im demographischen und makroökonomischen Kontext abgebildet. Die durchgeführten Modellierungsarbeiten

[8] Erlaubnis zur Zusammenarbeit wurde freundlicherweise erteilt von Professor Gisela Färber, Direktorin, Lehrstuhl für Wirtschaftliche Staatswissenschaften, insbesondere Allgemeine Volkswirtschaftslehre und Finanzwissenschaft an der Deutschen Hochschule für Verwaltungswissenschaften, Speyer.

[9] Erlaubnis zur Zusammenarbeit wurde freundlicherweise erteilt von Dr. Roland Berntzen, Leiter des Referats Sozialbudget, BMAS.

beruhen z. T. auf komplexen Programmierungsansätzen die die tatsächlichen Interdependenzen innerhalb des Sozialbudgets sowie mit seiner «Aussenwelt» möglichst korrekt und sinnvoll darstellen; im Berichtsteil wird auf eine entsprechende methodikzentrierte Darstellung weitgehend verzichtet; allerdings lässt sich dies nicht immer ganz vermeiden.

Es ist schliesslich auf die Grenzen des Modellierungsansatzes hinzuweisen. Diese Grenzen liegen zum einen in der Ausserachtlassung der grossen Themen Klima, Energie- und Lebensmittelsicherung (einschliesslich Wasser) bei der Setzung der langfristigen wirtschaftlichen Annahmen, obwohl diese Themen durchaus direkte oder indirekte Auswirkungen auf die Entwicklung der deutschen Volkswirtschaft haben duerften. ILO-SEC/SOC hofft, eine gewisse Bandbreite möglicher künftiger Entwicklungen durch die Szenariotechnik abgefangen zu haben.

Desweiteren liegen Grenzen der Aussagefähigkeit der Modellergebnisse im Modellierungsansatz der Grundsicherung (Sozialhilfe), die nur kursorisch abgebildet werden konnte. Es ist davon auszugehen, dass die Absenkung des gesetzlichen Rentenniveaus und des Niveaus der Beamtenversorgung in Zukunft zu zusätzlicher Inanspruchnahme von Sozialhilfeleistungen auf Gemeinde- bzw. Gemeindeverbandsebene führt. Ein entsprechendes, die Verteilung künftiger Haushaltseinkommen berücksichtigendes Modellierungsinstrumentarium stand für Zwecke dieses Berichts nicht zur Verfügung.[10] Es ist aber der Tendenz nach mit einer entsprechenden Erhöhung der Sozialleistungsquote in allen drei Szenarien zu rechnen, wobei die Anhebung im pessimistischen Szenario am höchsten, im optimistischen am niedrigsten sein dürfte. In Bezug auf das Inlandsprodukt duerfte sich dieser Effekt in einer Grössenordnung von maximal 1 bis 2 Prozentpunkten zusätzlicher Sozialleistungsquote bewegen.

Drittens ist darauf hinzuweisen, dass auf eine Modellierung der Einnahmen und Ausgaben einer weiteren *Institution «Riester-Rente»* bewusst verzichtet wurde, da nach der ESSPROSS Methodik von EUROSTAT noch nicht klar ist, ob die Leistungen von «Riesterprodukten» ins Sozialbudget einbezogen werden können.

Schliesslich wird darauf hingewiesen, dass es der gewählte Modellierungsansatz prinzipiell erlaubt, Einflüsse der gegenwärtigen globalen Finanzkrise auf das deutsche Sozialbudget zu berechnen. Hierauf wurde jedoch aus im wesentlichen zwei Gründen verzichtet: erstens konzentriert sich dieser Bericht auf langfristige Entwicklungen der Finanzen des Sozialbudgets; die Schlussfolgerungen, die aus den Berechnungen gezogen werden können, dürften solange nicht allzusehr auf ein explizites Krisenszenario reagieren, wie angenommen werden darf, dass die Krise kurzfristig verläuft und nicht desaströs auf die Realwirtschaft wirkt; zweitens ist anzunehmen, dass kriseninduzierte langfristige Wirkungen auf das Sozialbudget zum grossen Teil durch unsere pessimistische Variante abgedeckt werden; insoweit als dies nicht der Fall ist, werden einige der Vorschläge, die wir zur Reform der Finanzierung des Sozialbudgets machen, umso dringender.

[10] Hinzu kommen die folgenden grundsätzlichen Schwierigkeiten einer Abschätzung und damit einer adäquaten Modellierung: die Daten der GRV lassen noch keine Rückschlüsse darauf zu, wie gross der Personenkreis sein könnte, bei dem aufgrund des sinkenden Rentenniveaus die künftige Rente unterhalb des Grundsicherungsniveaus liegen wird; selbst bei Personen, die dann eine Rente aus der GRV unterhalb der Grundsicherung erhalten werden, ist unbekannt, ob sie einen Anspruch geltend machen, d aim Alter Andere Einkommensquellen vorhanden sein können; schliesslich hat ein Grossteil der Alten, die bereits heute eine Grundsicherung erhalten, überhaupt keinen Anspruch auf eine Rentenleistung und ist daher von der Absenkung des Rentenniveaus nicht betroffen.

Executive summary

The social budget [11] comprises all social benefits paid in Germany; in 2006, the total sum of benefits paid amounted to about 700.2 billion € or about 8500 € per inhabitant. [12] This corresponded to a *social expenditure ratio* of 30.3 per cent. [13]

Revenue collected in order to finance the benefits amounted to about 730.3 billion € or about 8865 € per inhabitant. This corresponded to about 31.5 per cent of GDP and a (positive) balance of 30 billion € or slightly over 1 per cent of GDP.

Historically, the ratio is relatively high; at the same time, however, it is 2006 already in a phase of cyclical decline. In our calculations the dynamics of the decline is mainly reflected by the assumed further reduction of unemployment (down to a minimum amount), and related reduced expenses on unemployment and related benefits, while accompanied by a simultaneous increase of employment, which, in the mid- to longer-term, is (only) limited by labour supply.

Social budget expenditure

Over the long run the *development* of the social expenditure ratio is essentially being determined by the structural impacts stemming from the reforms in social legislation during the first half of the current decade, and partially before, which have been modelled in the context of the assumed demographic and economic assumptions (three scenarios).

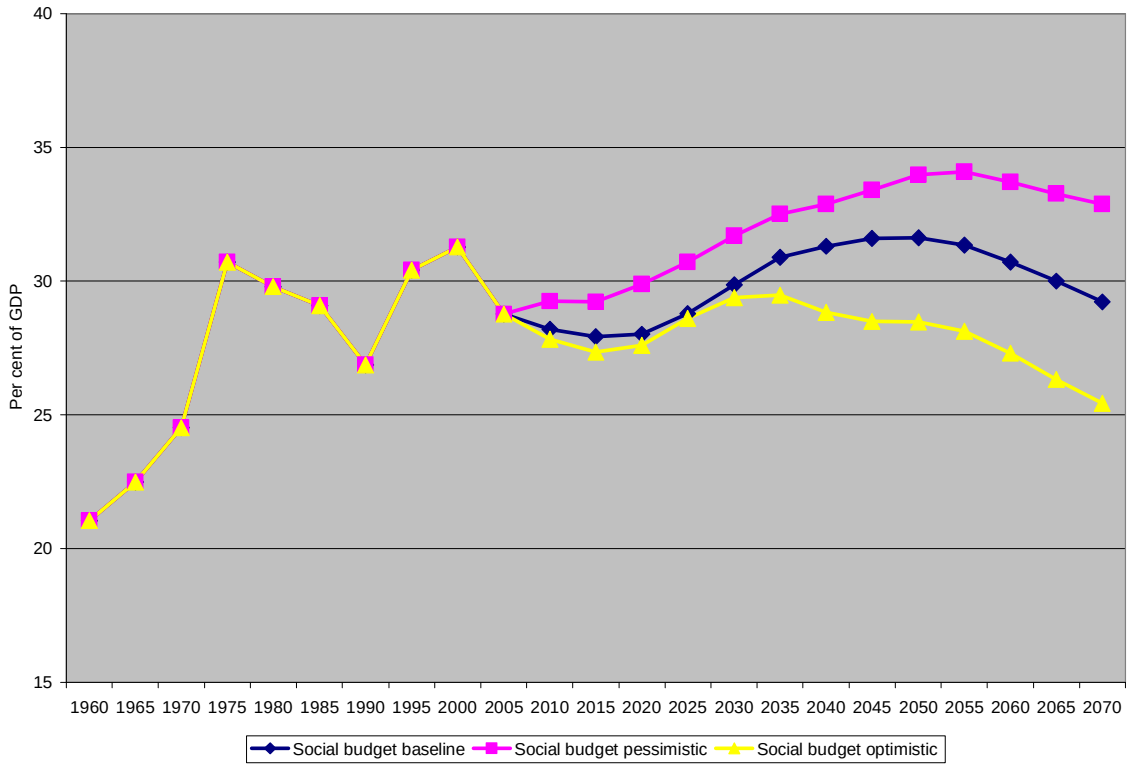
Details are being presented in the main body of the report. A first overview is provided by figure 1.

[11] Methodological explanations can be found in the *glossary* by the end of this report.

[12] Bundesministerium für Arbeit und Soziales (Hrsg.): Sozialbudget 2006 Tabellenauszug. Eigenverlag. Mai 2007. http://www.bmas.bund.de (download) [Federal Ministry of Labor and Social Affairs (ed.): Social budget 2006. Table excerpt. May 2007. http://www.bmas.bund.de (download), in German]

[13] Social budget expenditure in per cent of nominal GDP.

Figure 1. Development of the social expenditure ratio 1960 to 2070 – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b-p-o(2)].*

In summary, our results show that the social expenditure ratio

- In the baseline, stabilizes in the long-run slightly above historically known levels. This variant is characterized by a medium assumption on labour productivity, moderate annual net migration of plus 100,000 persons and a fertility rate converging towards 1800 children per 1,000 women; [14]

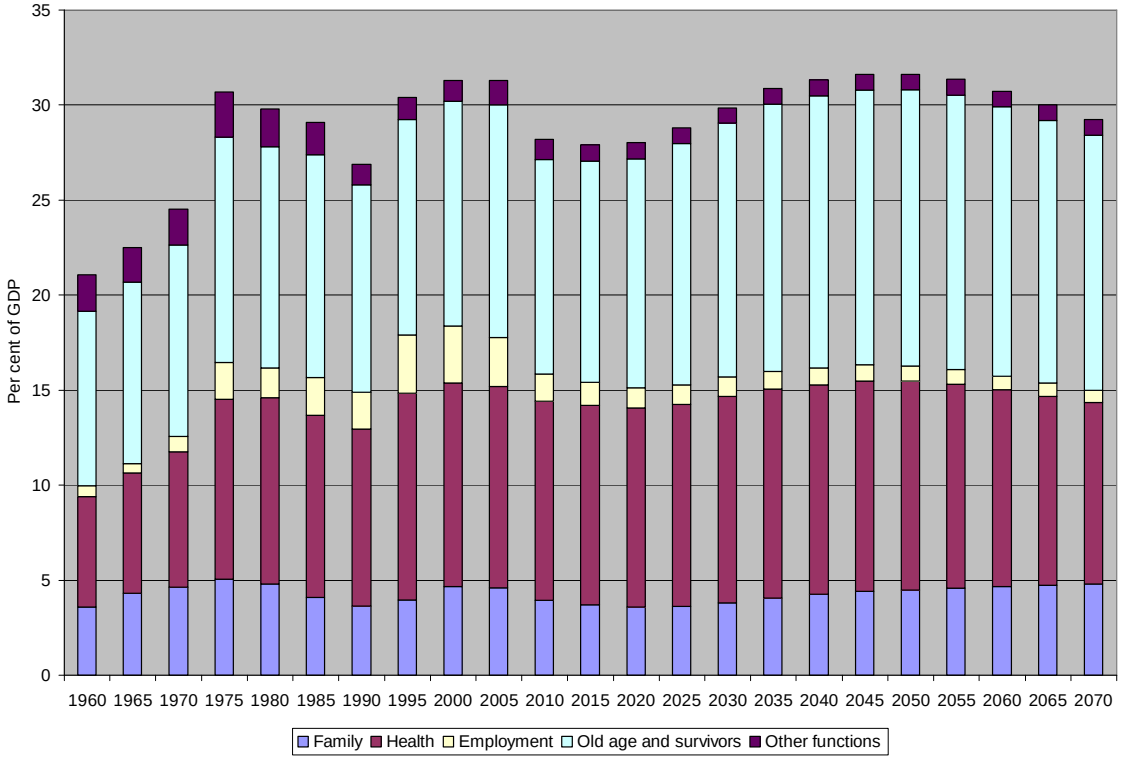
- In the pessimistic scenario, characterized by assumed slightly lower labour productivity, net migration of plus 50,000 persons p.a., and stabilization of fertility at present levels, levels out at around 2 to 3 percentage points above the baseline; and

- Falls significantly and, thus, clearly differs from the results of the other two variants, only in the optimistic scenario, which assumes relatively high labour productivity, annual net migration of plus 200,000 persons and fertility converging against reproduction levels (2100 children per 1000 women),.

The following sequence of figures (2a, 2b, 2c) reflects the above summarized developments by the main expenditure blocks (functions) of the SB:

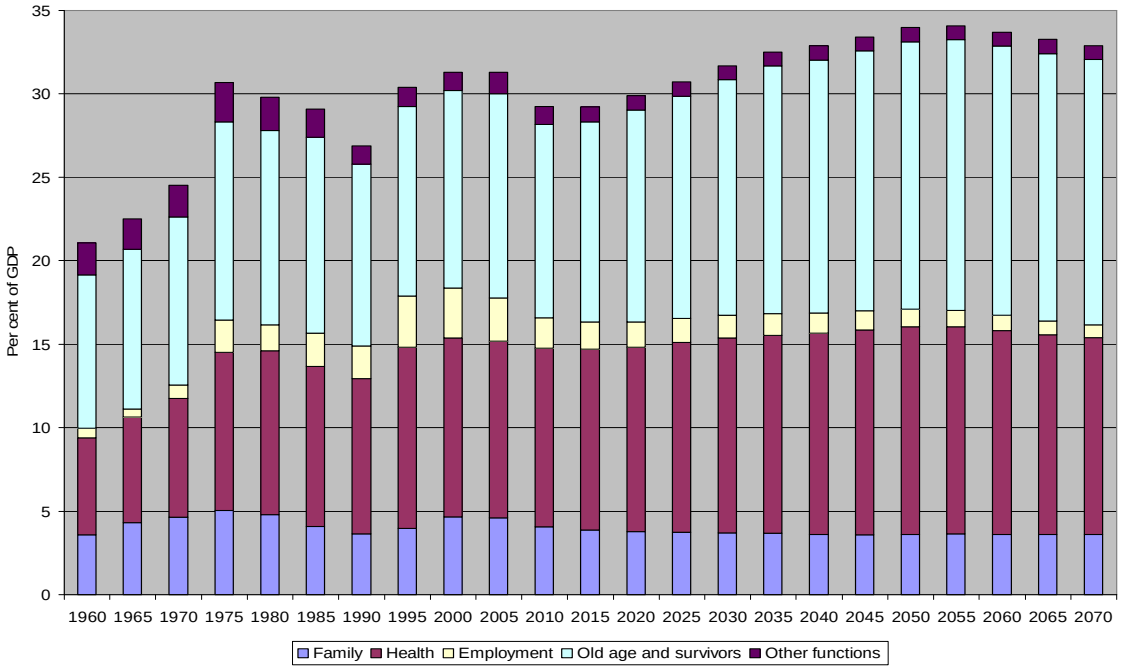
[14] The ILO population model functions such that in all variants mainly persons in active ages immigrate, taking with them a certain number of children, while elder persons (net) leave the country. The different fertility assumptions relate to women aged 15 to 49; all three variants assume in future identical mortality rates. Further explanations follow in the main body of the report. See also International Labour Office: *The ILO Population Projection Model (ILO-POP).* A Technical Guide (Version 1.1. 8/2002). The International Financial and Actuarial Service (ILO-FACTS), Financial, Actuarial and Statistical Services Branch, Social Protection Sector, International labor Office, Geneva, 2002.

Figure 2a. Development of the social *expenditure* ratio by functions 1960 to 2070 – baseline



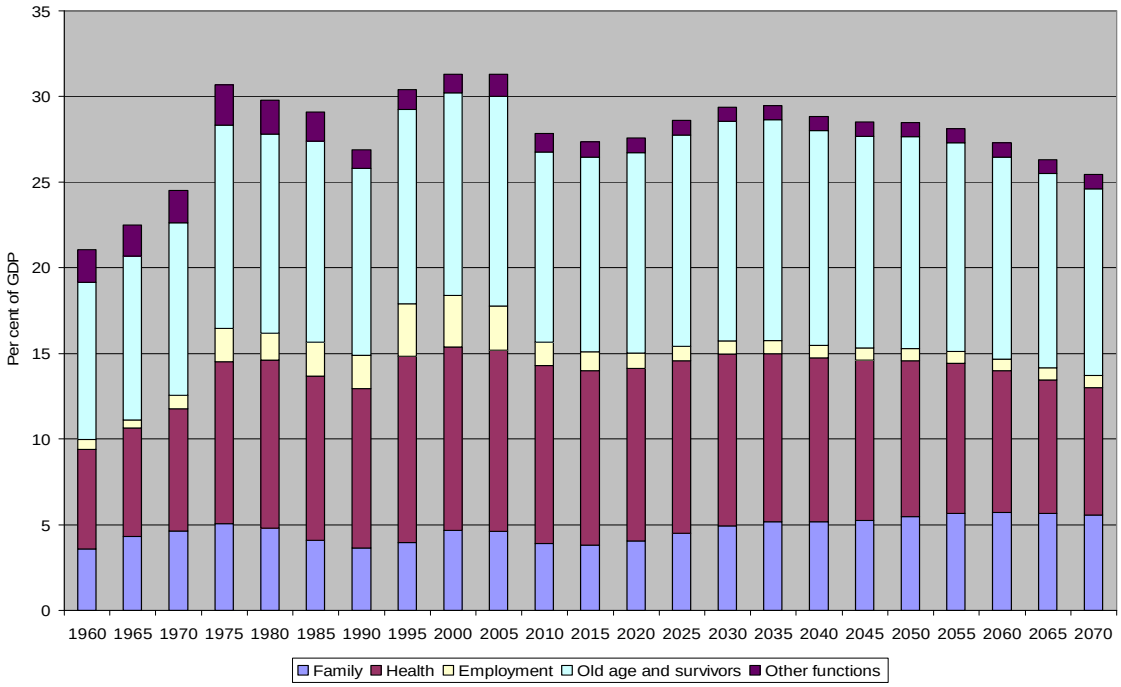
Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b(2)*].

Figure 2b. Development of the social *expenditure* ratio by functions 1960 to 2070 – pessimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-p(2)*].

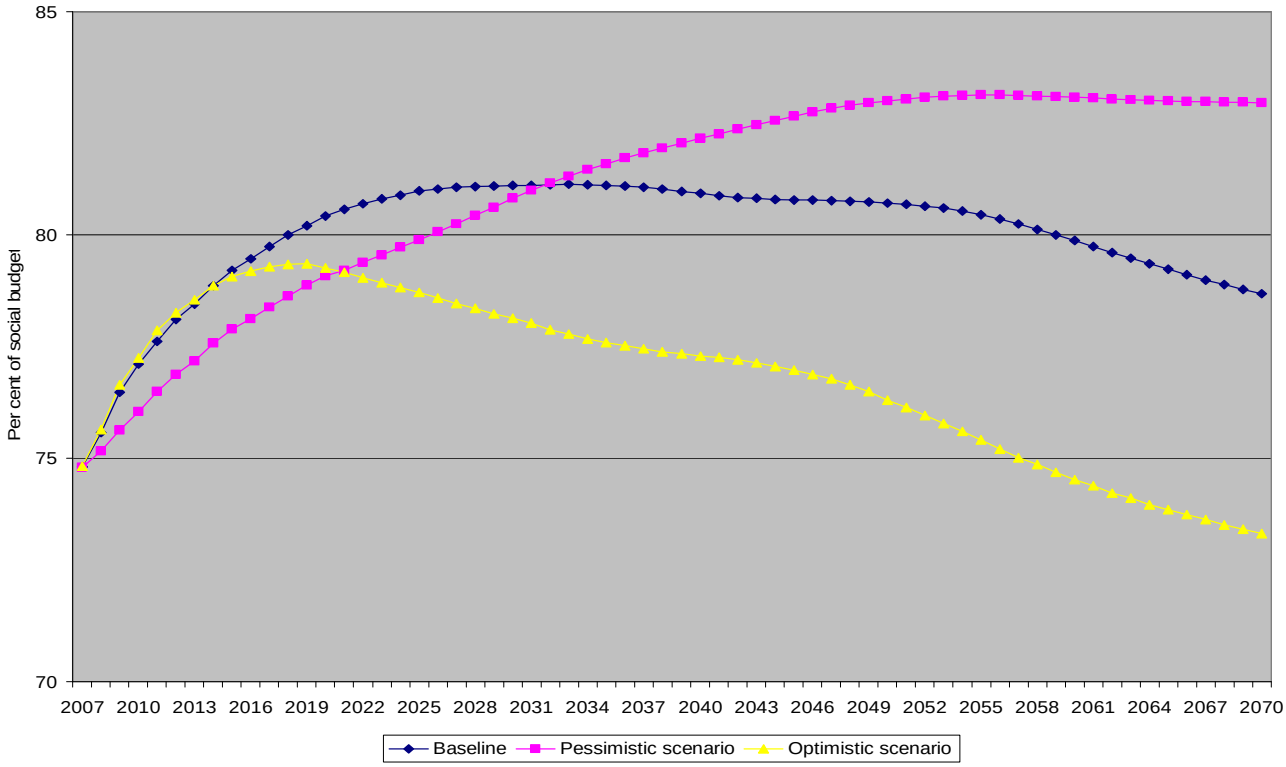
Figure 2c. Development of the social *expenditure* ratio by functions 1960 to 2070 – optimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-o (2)].*

The three variants imply significantly different developments of the relative financial weights of the policy areas represented by the dominant programmes: in the baseline, the two functions that traditionally dominate in Germany (as well as internationally), i.e. health and old-age, continue to do so in future and increase their combined share in the total SB from around 75 per cent now to around 80 per cent in the long run; in the optimistic scenario, the two functions' combined share in the SB declines to below 75 per cent and, thus, provides space for benefit improvements or changes in policy preferences; in the pessimistic scenario, the joint weight of the two functions grows even further to almost 85 per cent share in the SB. (Figure 3)

Figure 3. Joint share of functions «health» and «old-age and survivors» in the total social budget – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart5(2)].*

Chart 1 indicates on a qualitative basis variations in policy weights to be expected in the long run as a result of changing financial weights among different social functions of the social budget. (Also see tables 4d to 4f in the annex.)

Chart 1. Long-term changes in the financial weight of the most important policy areas under the SB (each in comparison to the other two scenarios)

Policy area	Baseline	Pessimistic scenario	Optimistic scenario
Family	+	- -	+ +
Health	0	+ +	- -
Employment	-	+ + +	- - -
Old-age and survivors	0	+ +	- -

Source: ILO.

Reading aid to chart 1:

0 Policy area *maintains* its financial weight in the long run

\+ Policy area *increases* its financial weight in the long run

\+ + Policy area *increases* its financial weight in the long run *much*

\+ + + Policy area *increases* its financial weight in the long run *very much*

\- Policy area *decreases* its financial weight in the long run

\- - Policy area *decreases* its financial weight in the long run *much*

\- - - Policy area *decreases* its financial weight in the long run *very much*

each cell *in comparison to the other two scenarios*.

Social budget revenue

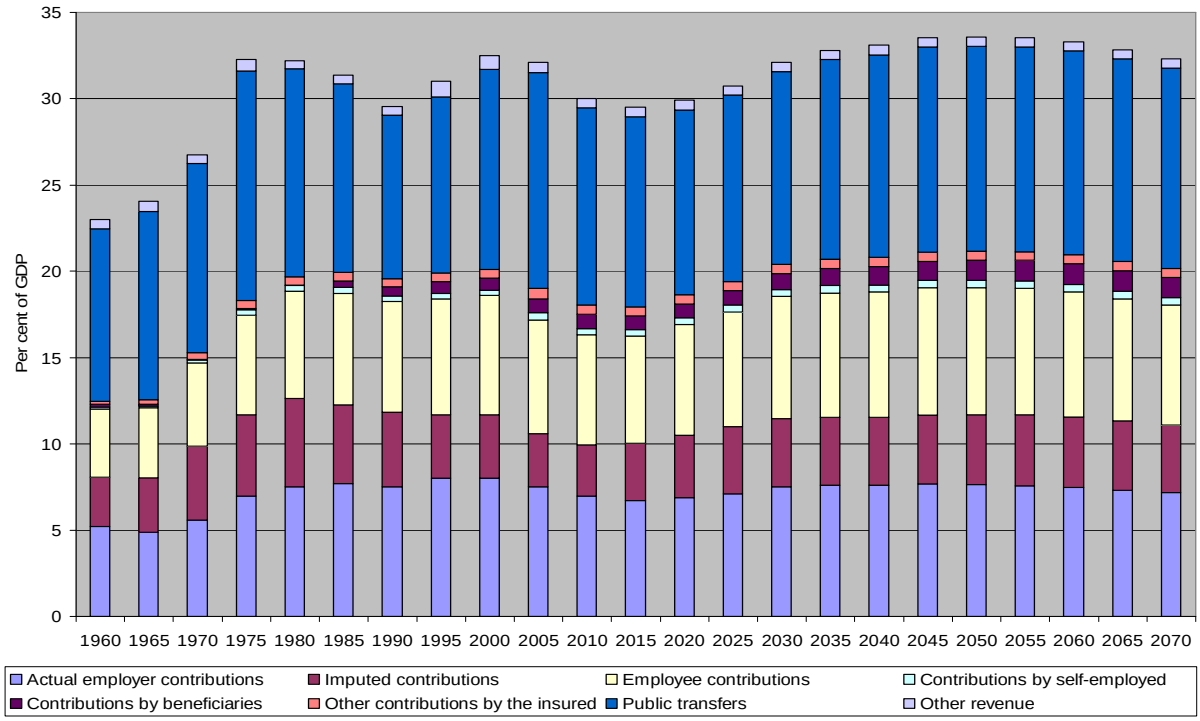
The revenue structure of the social budget clearly reflects the explicit tripartite financing structure of the German social state. While most states disposing of a social protection system (and related legislation) similar to the one of Germany concentrate spending, like Germany, on the areas of health, retirement income, family benefits and financially less important areas (like unemployment or individual poverty alleviation), there are partially remarkable differences on the revenue side, which can probably be explained by the objective to charge the cost of social security to the production factors in a different way than it is currently done in Germany.

Germany's social budget has been financed in the past by one third out of contributions of the insured, one third out of employer contributions, and one third out of state (public) transfers. Employer participation has over recent years slightly decreased, while contributions of the insured maintained a stable share (both against the European trend) and public transfers increased.

It is noted that the German social budget has always maintained a positive balance (difference between revenue and expenditure). The calculations as carried out on the basis of our demographic and economic assumptions show that Germany's social budget also in future disposes of sufficient resources to finance expenditure. The *social revenue ratio* will always be at least around ½ to 1½ percentage points higher than the social expenditure ratio. Thus, concerning level and development of the social revenue ratio we refer to the explanations given for the social expenditure ratio (see above).

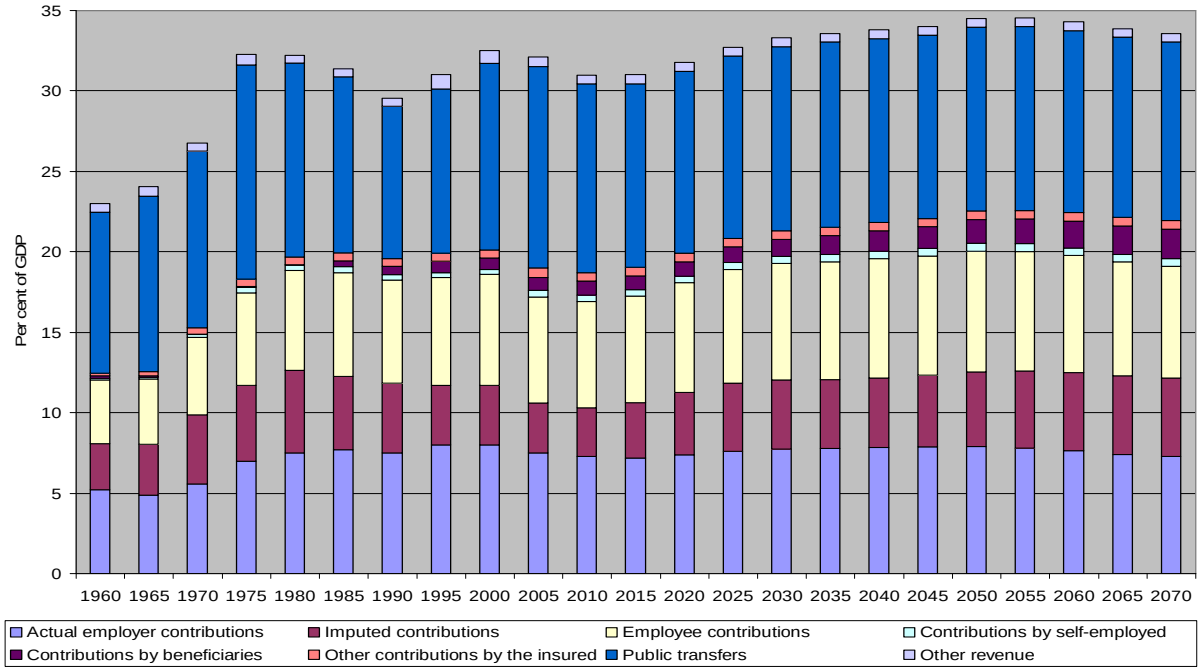
The sequence of figures, below (3a, 3b, 3c), provides an overview of long-term revenue trends by structure and dynamics of important components.

Figure 3a. Development of the social revenue ratio by components 1960 to 2070 – baseline



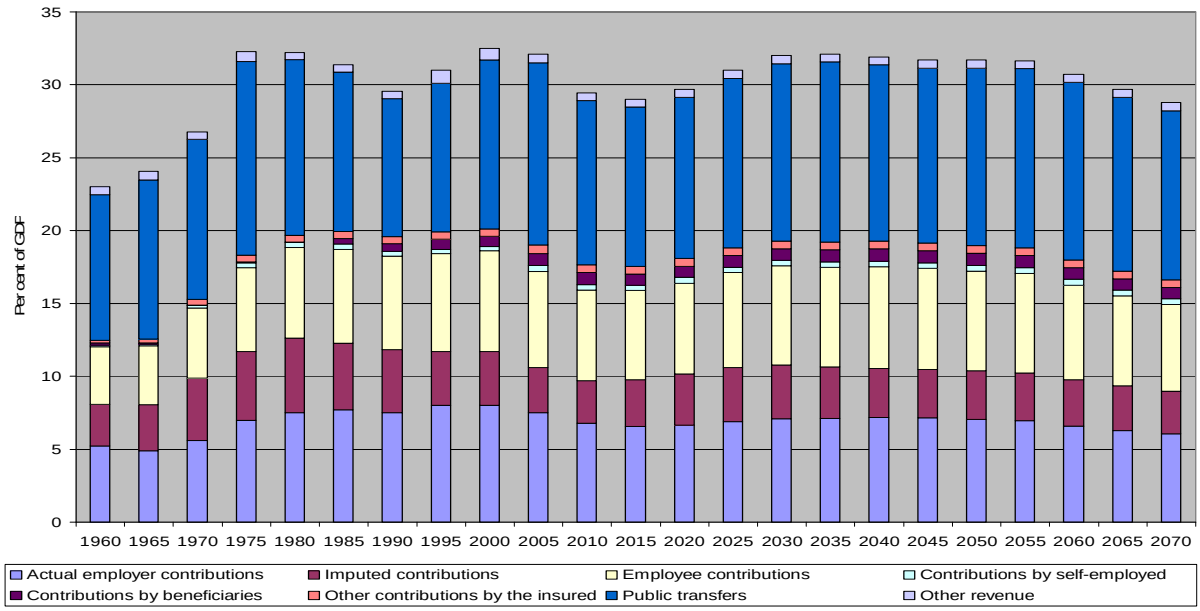
Source: Deutschlandmodell *[Tabellenanhang Sozialbudget.xls, Chart6(2)]*.

Figure 3b. Development of the social revenue ratio by components 1960 to 2070 – pessimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart7(2)*].

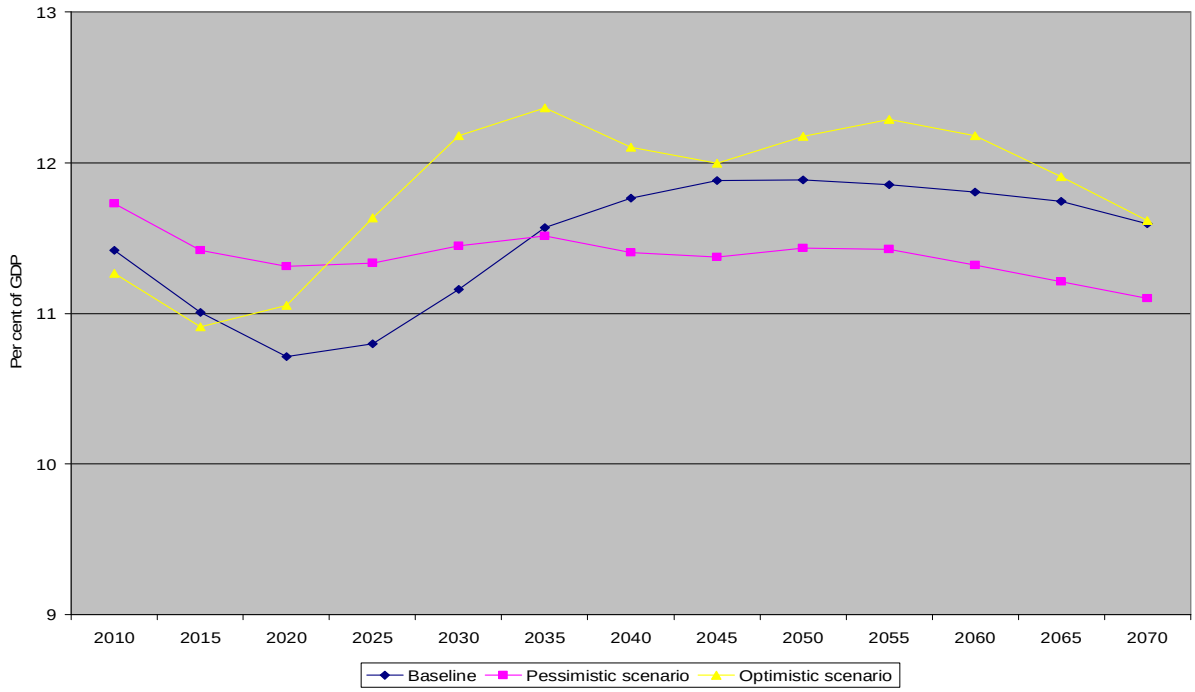
Figure 3c. Development of the social revenue ratio by components 1960 to 2070 – optimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart8(2)*].

While transfers from general revenue to the social budget remain at levels of between about 11 and 12 per cent of GDP they show clearly distinguished dynamics, by scenario, in their development in detail, which can mainly be explained by the interlude among the transfers paid to the *general systems* (SPI, SHI) with the tax-financed expenditure under the function *family*, which react especially sensitive to the set assumptions under each scenario on demography and economy (Figure 4).

Figure 4. Development of public transfers to the social budget – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart9(2)*].

Interpretation of results: social budget expenditure

From macro-financial and macro-economic points of view the results of our calculations are not spectacular: under both the baseline and pessimistic scenarios the social expenditure ratio will continue to hover around levels slightly above 30 per cent of GDP, i.e. around values that have in Germany been standard over the period 1975 to 2005. In other words, large parts of the macroeconomic product (GDP) will continue to be used for the provision of social benefits and services; and the expected resulting burden of the German economy in future compares well to levels with which the German economy coped successfully in the past. In the optimistic scenario, the ratio even declines and opens possibilities of increasing relative benefit levels in future.

Also, our study does not reveal fundamental imbalances of the financial provisions under Germany's social budget with respect to the changing population structure. In other words, the social budget will continue to allocate the available resources appropriately to those age groups especially dependent on social benefits and services. In order to investigate this issue more closely we tentatively calculated the relative shares of the social budget that are allocated to the age groups 0 to 19, 20 to 64, and 65+ (table 1), where

- age group 0 to 19 represents those persons depending on family and related benefits,
- 65+ represents those dependent on retirement income, and
- 20 to 64 represents those producing GDP.

All groups depend, with differing intensity, on health services (chapter 4).

The applied method allows for estimating roughly the «active» age group's (20 to 64) net financial welfare state burden. The net financial burden is calculated as the total social

budget minus the share of the social budget (expressed in per cent of GDP) that flows to the active age group. It reflects the amount being redistributed, net, from the actives to the non-actives.

We are aware of the fact that the groups are arbitrarily chosen; for example, in reality family benefits are eligible to persons aged over 19, and retirement benefits are being awarded to persons below 65. Accordingly, our calculations contain normative elements responding to questions like: «What would be the age-related allocation of the social budget if *all* (i.e. not just «most» or «almost all») benefits were paid conditional on the chosen age group?» However, we trust our calculations are meaningful as (1) most benefits can be considered correctly allocated by age groups and (2) the government have already undertaken steps aiming at more age-focused payment of benefits (examples are: family benefits (focus on additional kindergarten places; employment (reduction of active labour market measures); old-age benefits (increase of retirement age)). With respect to the allocation of health services by age groups, careful empirical estimation was possible on the basis of utilization rates and average costs per contact by age-groups.

Our calculations show that between 2010 and 2040, i.e. over the period of strongest demographic change

- In the baseline, (i) the net share in GDP redistributed through the social budget («net social burden») and (ii) the share of persons aged 0 to 19 and 65+ in the total population («dependent population») both increase by 26 per cent;

- In the pessimistic scenario, the net social burden increases by 28 per cent, while the share of the dependent population increases by 24 per cent;

- In the optimistic scenario, the net social burden increases by 15 per cent, while the share of the dependent population increases by 27 per cent.

In other words, in the baseline as well as in the pessimistic scenario social expenditure increases with the needs of a growing share of socially dependent population; the result under the optimistic scenario confirms that under this scenario there could be space for benefit improvements (Table 1a). For details we refer to tables 4q to 4s in the annex.

Table 1. Social budget by age groups – three scenarios

Year	2010	2020	2030	2040	2050	2060	2070
Baseline	**Baseline**						
	Per cent of GDP allocated via SB to age group						
SB allocated to age group 0-19	4.1	3.7	3.9	4.3	4.4	4.6	4.6
SB allocated to age group 20-64	8.4	7.3	6.7	6.3	6.1	5.9	5.8
SB allocated to age group 65+	15.7	17.2	19.5	21.0	21.3	20.5	19.0
Total SB in per cent of GDP	28.2	28.0	29.9	31.3	31.6	30.7	29.2
Net burden of age group 20 to 64	*19.9*	*20.8*	*23.2*	*25.0*	*25.5*	*24.8*	*23.5*
	Age group as per cent of total population						
Persons in age group 0-19 in per cent of total	18.6	16.9	16.8	17.6	18.1	18.9	19.9
Persons in age group 20-64 in per cent of total	60.9	60.1	54.8	50.7	49.6	49.5	50.3
Persons in age group 65+ in per cent of total	20.5	23.0	28.4	31.7	32.3	31.5	29.8
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Population aged 0 to 19 and 65+	*39.1*	*39.9*	*45.2*	*49.3*	*50.4*	*50.5*	*49.7*
Pessimistic scenario	**Pessimistic scenario**						
	Per cent of GDP allocated via SB to age group						
SB allocated to age group 0-19	4.2	3.9	3.8	3.6	3.6	3.6	3.6
SB allocated to age group 20-64	8.9	8.3	7.7	7.2	7.0	6.8	6.6
SB allocated to age group 65+	16.1	17.8	20.4	22.3	23.6	23.6	23.1
Total SB in per cent of GDP	29.2	30.0	31.8	33.1	34.2	34.0	33.3
Net burden of age group 20 to 64	*20.3*	*21.7*	*24.1*	*25.9*	*27.2*	*27.2*	*26.7*
	Age group as per cent of total population						
Persons in age group 0-19 in per cent of total	18.6	16.8	15.6	14.5	14.0	13.9	13.9
Persons in age group 20-64 in per cent of total	60.9	59.9	55.1	51.6	50.4	49.7	49.9
Persons in age group 65+ in per cent of total	20.5	23.3	29.3	33.9	35.7	36.3	36.2
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Population aged 0 to 19 and 65+	*39.1*	*40.1*	*44.9*	*48.4*	*49.6*	*50.3*	*50.1*
Optimistic scenario	**Optimistic scenario**						
	Per cent of GDP allocated via SB to age group						
SB allocated to age group 0-19	4.1	4.1	4.9	5.0	5.2	5.4	5.2
SB allocated to age group 20-64	8.2	7.1	6.5	6.0	5.9	5.6	5.4
SB allocated to age group 65+	15.5	16.2	17.8	17.5	17.0	15.9	14.3
Total SB in per cent of GDP	27.7	27.4	29.1	28.5	28.1	26.9	24.9
Net burden of age group 20 to 64	*19.5*	*20.3*	*22.6*	*22.5*	*22.2*	*21.2*	*19.5*
	Age group as per cent of total population						
Persons in age group 0-19 in per cent of total	18.6	18.9	21.3	21.9	22.8	24.4	24.8
Persons in age group 20-64 in per cent of total	61.0	59.1	52.8	50.4	50.4	50.5	52.5
Persons in age group 65+ in per cent of total	20.4	22.1	25.9	27.7	26.8	25.2	22.7
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Population aged 0 to 19 and 65+	*39.0*	*40.9*	*47.2*	*49.6*	*49.6*	*49.5*	*47.5*

Source: Deutschlandmodell; also see tables 4q, 4r and 4s in the annex.

Interpretation of results: social budget revenue

Because of the assumed decline in unemployment the UI contribution rate will be reduced significantly over the mid- to longer term; in the pessimistic scenario it will remain, however, at levels between 3½ and 4 per cent.

Financing (revenue) of the SPI was calculated on the assumption that no increase must take place of the legal contribution rate beyond 22 per cent of contributive wages and salaries; this assumption has stabilizing effects on the pension replacement rate (via the pensions-in-payment indexation formula) and simultaneously results in higher federal transfers to SPI, which are part of the overall public transfers as received by the social budget.

Under the assumption that the federal transfer to the SHI will be dynamized in line with macro-economic income developments the legal contribution rate to SHI shows (nevertheless) a seemingly unavoidable upward trend over the medium to longer term which, however, remains within manageable levels and acceptable given the assumed continuous medical progress (which is driving the costs on the expenditure side of SHI). A similar result materializes with respect to LTCI. Only in the optimistic scenario there is a tendency of falling contribution rates in the longer run.

Table 1a contains information on legal contribution rate developments as calculated under the three scenarios.

Table 1a. Contribution rates under the general systems – three scenarios

Year	Baseline				Pessimistic scenario				Optimistic scenario			
	SPI	SHI	LTCI	UI	SPI	SHI	LTCI	UI	SPI	SHI	LTCI	UI
	Per cent of contributive wages and salaries											
2010	19.9	14.9	2.1	2.4	20.0	15.0	2.1	3.7	18.9	15.0	2.1	2.1
2020	19.9	14.7	2.4	1.8	20.8	14.9	2.4	3.5	19.4	14.6	2.3	1.1
2030	22.0	15.6	2.5	1.9	22.0	16.3	2.6	3.7	20.6	14.6	2.3	0.9
2040	22.0	16.2	2.7	2.0	22.0	17.5	2.9	3.9	21.4	15.2	2.5	0.9
2050	22.0	16.7	3.0	2.0	22.0	18.0	3.3	4.0	21.1	15.2	2.7	0.9
2060	22.0	16.6	2.7	2.0	22.0	18.0	3.0	4.3	20.3	15.7	2.5	0.9
2070	22.0	16.0	2.2	2.1	22.0	17.8	2.5	4.7	18.9	15.7	2.1	1.1

Source: Deutschlandmodell.

It is obvious, at given demographic developments, that the level of contribution rates depends on the economic development, i.e. especially on the level of labour supply and employment rates, which dynamically increase in the optimistic scenario while accompanied by higher labour productivity.

Taking into account the results for the contribution rates public transfers will be increased – those to SPI according to formula and (during the phase of assumed maximum contribution rate of 22 per cent [see Chart 2]) through deficit coverage, those to SHI according to assumption;[15] furthermore, public transfers included in the social budget consist to a large extent of family benefits which are mainly determined, in their development over time, by the numbers of children and youth assumed under the three scenarios. In comparison to nominal GDP the increase of aggregate state transfers remains

[15] The employment agency (BA) does not need public transfers anymore for deficit coverage; ALG2 is being paid out of taxation, and is considered public transfer (subsidy) in the social budget methodology. ALG2 payments decline in all three scenarios because of declining unemployment and because ALG2 benefits are indexed with inflation.

moderate such that we don't see additional financing problems for the state budgets [16] as long as their revenue follows nominal GDP. Reference is made to figure 4, above. [17]

As a result the revenue structure of the social budget will not change much in comparison to the developments as observed after German unification; the tripartite organisation of the German social state will also in future be reflected in the social budget revenue.

However, a significant discrepancy is observed between statutory contribution rates and contributions actually paid by employers and employees in per cent of macroeconomic output (Table 1b).

Table 1b. Actual employer and employee social security contributions in per cent of GDP – three scenarios

Year	Social security contributions actually paid								
	Sum	Employers	Employees	Sum	Employers	Employees	Sum	Employers	Employees
	Baseline			Optimistic Scenario			Pessimistic Scenario		
	%								
2010	13.4	7.0	6.4	13.0	6.8	6.2	13.9	7.3	6.6
2020	13.3	6.9	6.4	12.9	6.6	6.2	14.2	7.4	6.8
2030	14.6	7.5	7.1	13.9	7.1	6.8	15.0	7.7	7.2
2040	14.9	7.6	7.3	14.1	7.2	7.0	15.3	7.9	7.4
2050	15.0	7.6	7.3	13.9	7.0	6.9	15.4	7.9	7.5
2060	14.7	7.5	7.2	13.1	6.6	6.5	14.9	7.6	7.3
2070	14.1	7.2	7.0	12.0	6.1	6.0	14.2	7.3	6.9

Source: Deutschlandmodell.

Interpretation of results: impacts on unit labour costs and net real wages

The impact on *labour cost* development of the estimated development of contribution rates is in all three scenarios marginal. In comparison to a hypothetical scenario in which employer contributions (as a percentage of the national average wage) were kept constant in the long run labour unit costs [18] develop in all three scenarios only marginally faster: in all variants the deviation (of growth rates of labour unit costs) from the hypothetical scenario remains within limits between plus 0.1 and 0.3 per cent annually; in most years deviations are almost not measurable.

The labour income share in GDP (compensation of employees in per cent of nominal GDP) hovers in all three scenarios around 50 per cent; in the optimistic scenario it remains in all years below 50 per cent.

In assuming a constant average wage tax rate over the projection period the simulated increases in contribution rates have a slightly dampening effect on *net wages*. The effects

[16] Budgets of the federal and state governments.

[17] Figure 4 contains family benefits and other transfers and federal transfers to SPI and SHI; it also contains the payments under ALG2.

[18] Unit labour costs = (compensation of employees / number of employees) / (real GDP / number of employed).

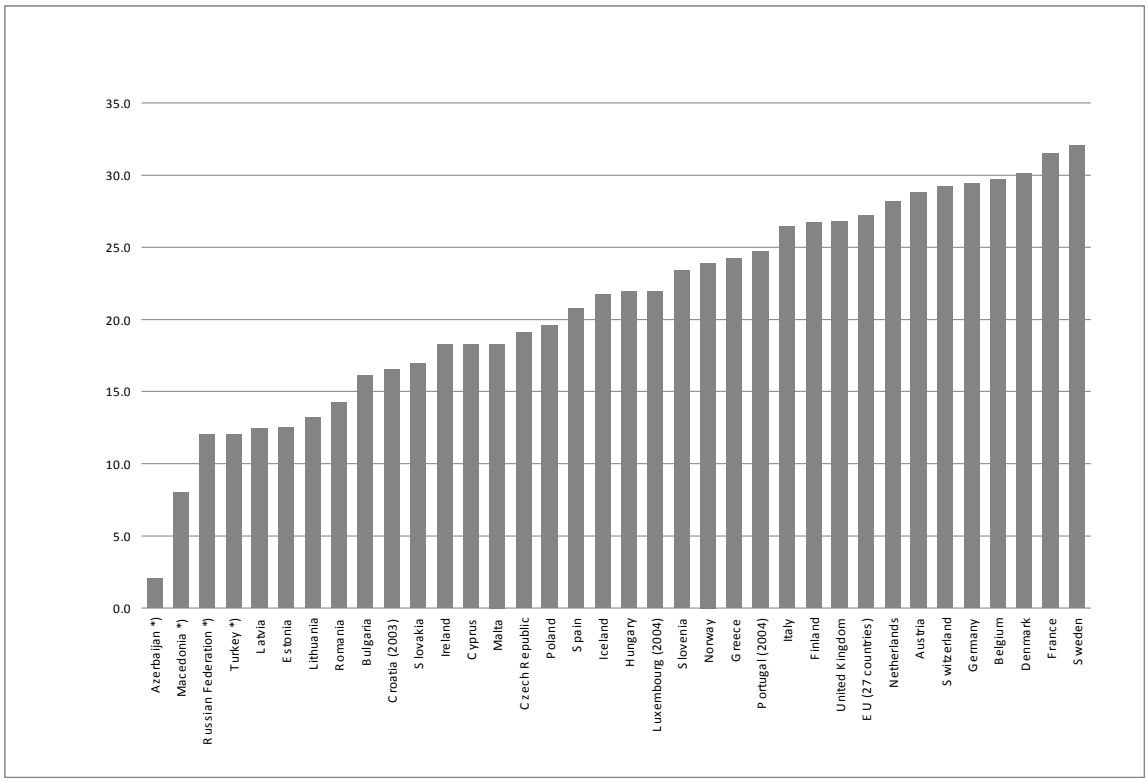
are mirroring those on labour unit costs. In the pessimistic scenario one might expect net real wages to decline over extended periods, perpetuating the situation of the past two decades. This could be the case, especially, if the SHI makes use of the possibility to levy additional contributions on the insured (maximum = 1 per cent); this scenario was not calculated.

Conclusions with respect to social budget expenditure

From a financial point of view the German social budget can be considered as consolidated (expenditure side). On the basis of our calculation results, further reductions of benefit provisions, aiming at stabilizing expenditure levels, are not necessary and could be counter-productive also with respect to domestic economic developments. [19]

Within Europe Germany belongs to those twelve countries with a social expenditure ratio of 25 per cent and more (figure 5). In other words, Germany's social expenditure is high in international comparison. However, in national as well as international comparison, the effects of the expenditure (including its financing) on enhancing productivity and stabilizing incomes must not be undervalued.

Figure 5. Social expenditure ratios in international comparison, 2005



Quelle: EUROSTAT; *) ILO estimates. [*Eurostat Total social protection.xls, Chart1*].

[19] International Labour Office: *Social protection as a productive factor*. Governing Body Geneva, 294th Session, November 2005 (Committee on Employment and Social Policy ESP, GB.294/ESP/4).

Therefore, a first possible conclusion is, that the society can now trust in the rational of the measures taken and let the social budget develop, basically as legislated.[20] In assuming that the measures as taken in old-age and health legislation in order to strengthen individual responsibility as well as the strategic changes in labour market policies will unfold, over the medium to longer term, certain positive economic effects (that to assess was not the purpose of this report) such a social policy strategy could be communicated as compromise between the economic and social requirements resulting from demographic change.

Second, our results show that there could even be room for benefit improvements also in future. The long-term increase of the relative amounts of primary resources re-distributed through the social budget does not seem to exceed economically acceptable limits. Areas for possible action could be old-age and employment.

Benefit improvements appear justifiable in the area of old-age as otherwise an increase in poverty levels at old age will emerge in the long run. In this context revisions of the decision to increase statutory retirement age may weaken the concentration of benefits on the higher age groups of the population.[21] Benefit improvements could instead aim at principally avoiding individual old-age pensions lower than social assistance standard rates or below a defined social minimum *above* social assistance. To achieve this, one could explore changing the present pension formula by introducing a flat component, identical for all retirees, and to be regularly indexed with CPI developments. Given the usually long transition periods that must be honoured in old-age income security systems reform steps would have to be taken soon in order to guarantee that the generation presently entering the labor markets can later take advantage accordingly.

In the area of *function employment* a *flexicurity* concept could aim at balancing the interests of the economy with respect to required time-wise, spacial as well as skills and training related flexibility with the income security interests of labor (chapter 6). Such reform is, of course, primarily "structural" but could probably not be implemented neutrally with respect to required resources; expenditure amounts under function employment would increase, not the least, because (i) the benefits to be paid during the no-employment spells could be significantly above present unemployment benefit rates (this would be the price to be paid in return for labor's higher flexibility) and (ii) the infrastructure to be maintained in order to guarantee (a) close interlinkages between those offering and those looking for work places as well as (b) training capacities (which, both, is essential to the flexicurity concept). The concept is especially interesting from the point of view of financing the social budget (revenue) as it would guarantee, depending on concrete implementation, steady contribution payments of the employed over their respective individual life-cycles *despite labor markets' increased flexibility*.

Conclusions with respect to social budget revenue

Independent from possible conclusions to be drawn on the expenditure side a reform of the financing of Germany's social budget appears necessary in any case.

The reason basically roots in the insecurity about the future development of the structure of the German labor market in its interdependency with other markets in a globalized world.

[20] The measures foreseen in the SHI were taken account of in our calculations as far as these were considered quantifiable.

[21] Our calculations with respect to the future development of the number of pensions in payment demonstrate the extent to which this policy can be successful under given legislation.

If it were justified to trust, with some higher level of confidence, the set assumptions on future employment levels, and herein especially the assumptions on the future development of the number of contributors, then even the contribution rate development under the pessimistic scenario could be considered as manageable; after all, plus 7 percentage points of contributions building up over a period of 40 years can not be considered dramatic, especially if this is (i) a result of improved benefits and services of the health system and (ii) owed to demographic transition which, after its termination, opens space for contribution rate reductions.

Currently, however, such robustness of setting modelling assumptions seems no longer be given. Especially, it can not be excluded that labor markets will be exposed to further flexibility moves, which – in the German context – could result in a reduction (compared to the scenario assumptions) of the number of work places contributive to social security.

Furthermore, we assumed in our model that the legislated increase of retirement ages is paralleled by according increases in labour market participation and employment (contributors) in the higher ages; if reality would prove, in deviating from our assumption, that enterprises continue to opt for the juvenile employed labour force, then a serious (new) social policy problem would emerge the solution of which would require more financial resources. Another problem is the assumption of healthy aging in the health sub-model, which, again, might be proven wrong by reality, and thus potentially implying higher health costs in the long run.

It adds that all results depend on the assumption that Germany's domestic wage policies will in future be based on (domestic nominal average) labour productivity development for *all* employees. If trade unions and employer organizations would not pursue such a policy nation-wide (i.e. not only in selected sectors), then our contribution rate calculations (projections) were obsolete, in which case contribution rates to SPI, SHI and LTCI would increase and no benefit improvements would be possible.

Finally, it must be mentioned that in all variants, even in the pessimistic scenario, the set assumptions inherently comprise an «optimistic bias» in that they ignore the possibility of business cycles or more significant structural economic crises. Such events will, however, also in future impose their impact on the finances of the social budget.[22] Despite their appearance in reality, it is difficult to map such situations in simulation calculations, as undertaken for this report. With respect to the non-inclusion of calculations addressing the specific aspects of the current global financial crisis see foreword / Vorwort.

As a consequence of the above listed insecurities in our model calculations it may be advisable to reconsider the financial basis of the German social state with a view to replace its dependence on labour income by a basis that is potentially more robust with respect to the future labor market insecurities.

Alternative financial sources

With respect to the financing of a higher social expenditure ratio there are mainly the following three measures available:

[22] Scholz, W. and Drouin, A.: *Regular adjustment of financial parameters of social protection systems in volatile inflationary environments.* In: International Social Security Review, 1/98, Vol. 51, No. 1, 1998, pp. 47 to 71. Blackwell Publishers. This essay describes an extreme economic situation in which social security systems might be ending up; however, such exceptional situation appears world wide on average in about one or two countries, annually.

1. The additional expenditure of the social budget could be paid through inclusion of other (non-labour) income into the financing base;

2. In addition, the contribution assessment ceilings, which have been constitutional to Germany's social protection system, could be abolished; contribution assessment ceilings mirror old structures of relatively equal income distribution and in a situation of growing income inequality contribute substantially to the increase of the legal contribution rates for mid- and low income earners while favouring higher incomes;

3. In addition, the tax-financed share of the social budget could be increased.

Potential of reducing contribution rates

On a pure *calculatory basis* the above measures, when taken together, bear *significant potential for reducing present statutory contribution rates*. If one assumes, specifically, National Income (in German SNA definition) as the financial basis of the social budget the total contribution rate could be reduced, in both the baseline and the pessimistic scenario, to slightly above 30 per cent (in the maximum),– hereby, it is understood that about 1/3 of total social expenses would continue to be financed out of taxation. On the same assumption, for SPI and SHI alone the combined contribution rate could be reduced to around 25 per cent.

We would like to point out that the above estimations of contribution rates have not been endogenously calculated with our models [23] but, rather, they are the result of comparative-static calculations outside the applied models; [24] especially, these calculations do not take into account possible behavioural net-effects of winners and losers among economic actors (private households, enterprises) [25] that might be affected by the measures 1 to 3. Also, it must be mentioned that GDP and National Income are statistical items; in a legislative context, contribution rate calculations must, however, be based on primary incomes that are actually accessible in an administrative sense by the tax (contribution) collecting authorities. Furthermore, the estimations are valid only as long as the measures under 1 to 3 can be implemented without expenditure increases.

Social pension insurance

Broadening the financing base of the social budget without increasing expenditure (in comparison to status-quo) is, in the SPI, only possible if the inclusion of additional primary incomes is not equivalent with coverage of additional groups of persons; respective proposals have been intensely discussed in the respective literature («earmarked tax on the return on capital – Maschinenbeitrag», «contributions or earmarked tax on value-added - Wertschöpfungsabgabe»); meanwhile, the questions of their administrative applicability

[23] Especially, the estimations are not results of the applied pension and health insurance models.

[24] One might, therefore, interprete these contribution rates as materializing in a new equilibrium after implementation of the said measures – while the estimations disregard substitution effects on labor–, capital- and goods and services markets that might result from changed incentive structures.

[25] With respect to the inclusion of such effects, and their potential impacts, see, for example: Fehr, Hans und Heinrich Jess (2006): Health premiums or health contributions? An evaluation of health care reform options in Germany. Schmollers Jahrbuch (126.), Heft 1, S. 21-57.

appear to be solved.[26] Also, inclusion of additional primary incomes must not result in higher individual entitlements of the insured; basically this would probably require not only (partial) abolition of the equivalency principle between contributions paid and benefits received but also the stipulation of maximum benefits (e.g. by replacing present contribution assessment ceilings with *benefit assessment ceilings*). In the unemployment insurance problems would occur analogously.

Social health insurance/long-term care insurance

In SHI, solutions similar to SPI are considered possible. Indeed, it is much more difficult than under SPI for the legislator to foresee possible behavioural reactions of the insured and of service providers. Therefore, increases in health expenditure as a result of widening the financing basis of the health insurance cannot be excluded with the same theoretical rigour as under SPI. The tasks of controlling costs while improving services quality in the health system and, at the same time, provide equitable access to modern health services to all citizens may become more difficult as a result; it is expected, however, that the implementation in 2009 of the «health fund» in the long run contributes positively to those tasks. Therefore, we expect that broadening the financial basis (revenue) of the function health of the social budget is possible while parallel expenditure expansion can be avoided. With respect to the LTCI analogous considerations apply.

Unemployment insurance/function employment

Under UI a reduction of the contribution rate appears «inevitable». Broadening its financial basis would be necessary for systematic reasons in case respective steps were taken under SPI and SHI. Also, this issue emerges in case of an implementation of the flexicurity concept. For reasons described above its realization would inevitably lead towards higher expenditure – in comparison to our status-quo calculations of function employment – and result, accordingly, in a higher social expenditure ratio. Questions of equivalence between contributions paid and benefits received would play only a minor role (other than in SPI).

Well prepared for future reforms

The results of our calculations, and the above considerations, indicate that after the measures of financial consolidation taken in the past no further reforms are necessary that would require a net[27] reduction of existing benefit provisions.

To the contrary, measures that would result in increasing the social expenditure ratio appear financially possible; they should be oriented towards avoiding future poverty at old-age and / or respond to labour's enhanced income security needs under the flexibility requirements of changing labor markets.

However, priority should be given to reforms on the revenue side of Germany's social budget. Improvements of benefits seem not to be urgent in the short run.[28] Indeed, in the

[26] See, for example: Bussmann, Ludwig, Walter A.S. Koch and Perygrin Warneke: *Der Wertschöpfungsbeitrag zur Finanzierung der gesetzlichen Rentenversicherung*. Campus. Frankfurt/New York, 1992.

[27] In principle, we would not exclude reforms aiming at changing the structure of the social budget, for example by reducing the share spent on old-age in favour of the share spent on youth and children.

reality of the German social state revenue and expenditure of the social budget are intimately interwoven and, thus, a reform of the one is difficult to achieve without reforming the other. Nevertheless, new financing options should be explored.

Germany finds itself in a favourable strategic situation when compared to systems based only (or primarily) on private, fully funded schemes. On the one hand, the German PAYG system is secured by a continuously growing domestic tangible capital stock which, together with a well educated labor force, guarantees world-class production (and, thus, income); on the other, PAYG-systems are generally open to and easily accessible by short-term policy intervention; this means, legislation is always in a position to intervene directly with regard to the scheme benefit levels – not only in order to cut benefits but, when necessary, also through measures that increase benefits.

From the point of view of the ILO all reform measures are adequate and acceptable which guarantee also in future that Germany fulfills its obligations resulting from Conventions Nos. 102 and 128, especially with respect to old-age security, which Germany has both ratified. This includes, in principle, reforms aiming at fostering additional individual old-age savings on fully funded basis *as long as* these, together with the public system(s) *guarantee* compliance with the minimum standards as defined in the two conventions. The fulfillment of the requirements of Conventions Nos. 102 and 128 might in future require additional resources. Our calculations support the conclusion that the future development of Germany's social budget might make that possible.

[28] We are talking here about structural improvements; where considered appropriate, short-term indexation of benefits, for example under social assistance or under "Hartz IV", in reaction to the most recent increases of the prices of food and energy should of course be possible. The rules as legislated under SPI should be followed.

Zusammenfassung der wichtigsten Ergebnisse [29]

Die im Sozialbudget [30] zusammengefassten Sozialleistungen der Bundesrepublik Deutschland betrugen 2006 etwa 700,2 Mrd € oder rund 8500 € je Einwohner. [31] Dies entsprach einer *Sozialleistungsquote* von 30,3 Prozent. [32]

Zur Finanzierung wurden rund 730,3 Mrd € oder rund 8865 € je Einwohner aufgewendet. Dies entsprach einer Beanspruchung des Bruttoinlandprodukts (BIP) in Höhe von rund 31,5 Prozent und einem Finanzierungsüberschuss von 30 Mrd € oder gut 1 Prozent des BIP.

Historisch gesehen ist die Quote damit relativ hoch, gleichzeitig befindet sie sich aber bereits in einer Phase zyklischen Rückgangs, dessen Dynamik bei den Langfristberechnungen dieses Projekts im wesentlichen durch den angenommenen weiteren Rückgang der Arbeitslosigkeit bis auf einen Sockelbetrag, bei gleichzeitigem Beschäftigungsanstieg, der mittel- bis längerfristig (nur) durch das Erwerbspersonenpotential begrenzt wird, berücksichtigt wurde.

Die Leistungen des Sozialbudgets

Langfristig wird der *Verlauf* der Sozialleistungsquote wesentlich von den strukturellen Wirkungen bestimmt, die von den Reformen in der Sozialgesetzgebung während der ersten Hälfte des laufenden Jahrzehnts, und teilweise im Jahrzeht davor, ausgehen und im Rahmen der angenommenen demografischen und ökonomischen Annahmen abgegriffen werden (drei Szenarien).

Einzelheiten werden im Hauptteil des Berichts beschrieben. Einen ersten Ueberblick der Ergebnisse vermittelt Grafik 1.

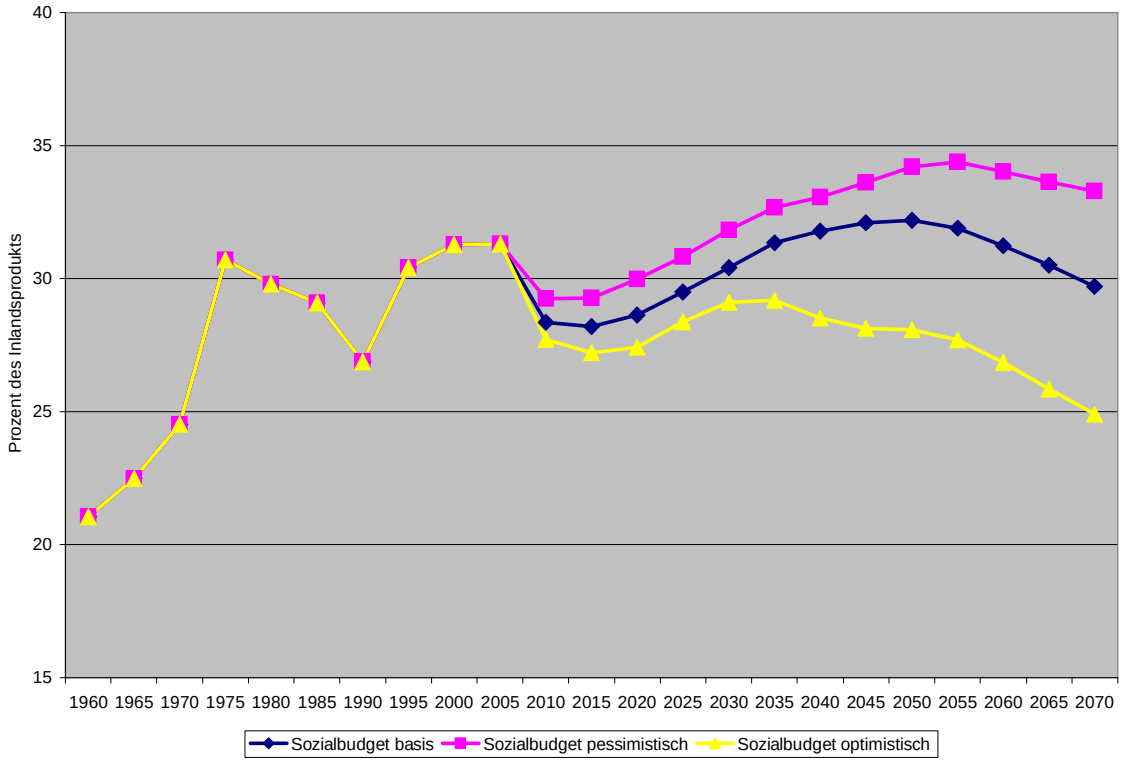
[29] Alle Berechnungen unterstellen Fortgelten des gesetzlichen Status-quo vom 31. 12. 2006; wesentliche sozialbudgetwirksame Beschlüsse der Bundesregierung, soweit bis Herbst 2007 bekannt, sind berücksichtigt. Dies bedeutet u.a., dass die jüngsten Beschlüsse zur vorübergehenden Aussetzung des «Riesterfaktors» bei den Rentenapassungen 2008 und 2009 nicht in die Berechnungen eingegangen sind; die Grössenordnung sich dadurch ergebender Abweichungen bei der Berechnung des gesamten Sozialbudgets liegen langfristig allerdings im Bereich üblicher Prognoseungenauigkeiten.

[30] Methodische Erläuterungen befinden sich im *Glossar* am Ende dieses Berichts.

[31] Bundesministerium für Arbeit und Soziales (Hrsg.): Sozialbudget 2006 Tabellenauszug. Eigenverlag. Mai 2007. http://www.bmas.bund.de (download).

[32] Leistungen des Sozialbudgets in Prozent des Bruttoinlandprodukts.

Grafik 1. Entwicklung der Sozialleistungsquote von 1960 bis 2070 – drei Szenarien



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b-p-o*].

Zusammengefasst zeigen unsere Ergebnisse, dass die Sozialleistungsquote

- In der Basisvariante langfristig eine Tendenz zur Stabilisierung etwas oberhalb historisch bekannter Niveaus aufweist. Diese Variante ist gekennzeichnet durch eine mittlere Arbeitsproduktivitätsannahme, einen historisch moderat angesetzten jährlichen Wanderungssaldo[33] von plus 100,000 Personen und eine Konvergenz der Geburtenrate gegen 1800 Kinder je 1000 Frauen;

- Sich im pessimistischen Szenario, gekennzeichnet durch eine etwas niedrigere Arbeitsproduktivität, niedrige Nettozuwanderung (plus 50,000 Personen p.a.) und Stabilisierung der Geburtenrate auf gegenwärtigem Niveau, etwa 2 bis 3 Prozentpunkte über derjenigen der Basisvariante einpendelt; und

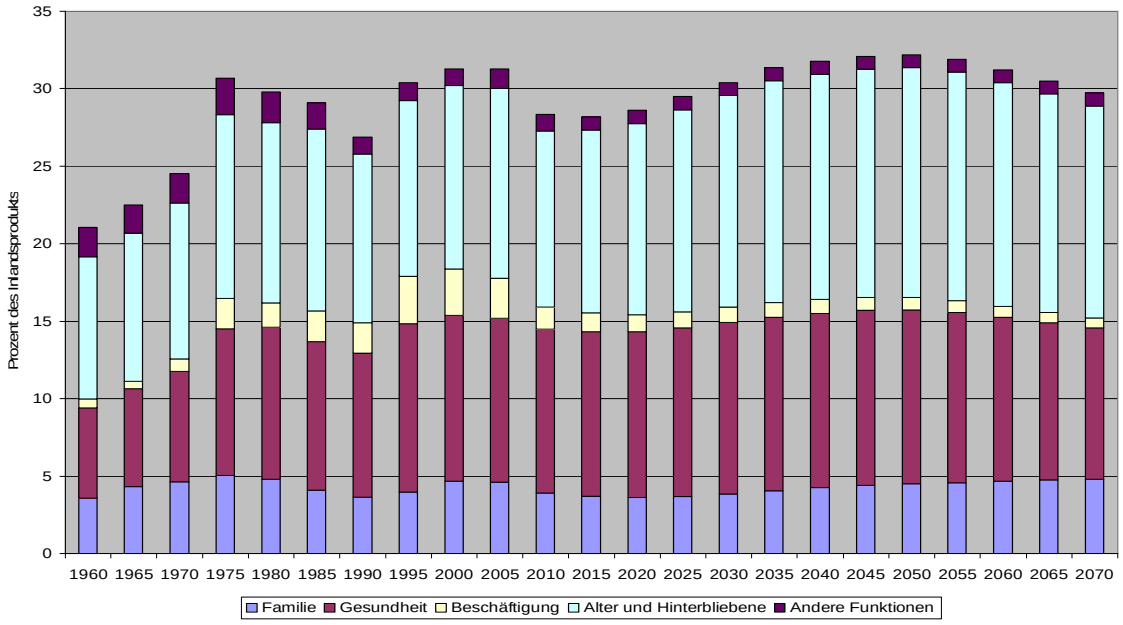
- Nur im optimistischen Szenario, das eine vergleichsweise hohe Arbeitsproduktivität und einen jährlichen Wanderungsüberschuss von 200,000 Personen bei gleichzeitiger

[33] Das ILO Bevölkerungsmodell verarbeitet die Wanderungsannahmen in allen Varianten derart, dass überwiegend Personen im arbeitsfähigen Alter zuwandern, diese gleichzeitig eine gewisse Anzahl von Kindern mitbringen, alte Zuwanderer das Land (netto) wieder verlassen. Die unterschiedlichen Fertilitätsannahmen beziehen sich auf die Kohorte der Frauen im Alter 15 bis 49 Jahre; in allen drei Bevölkerungsvarianten wird von identischer künftiger Entwicklung der Mortalitätsraten ausgegangen. Weitere Erläuterungen zu den gesetzten Annahmen folgen weiter unten und im Hauptteil des Berichts. Siehe International Labour Office: *The ILO Population Projection Model (ILO-POP).* A Technical Guide (Version 1.1. 8/2002). The International Financial and Actuarial Servic (ILO-FACTS), Financial, Actuarial and Statistical Services Branch, Social Protection Sector, International labor Office, Genva, 2002.

Konvergenz der Geburtenrate zum Reproduktionsniveau (2100 Kinder je 1000 Frauen) unterstellt, klar fällt und sich deutlich von den Entwicklungen in den beiden anderen Varianten unterscheidet.

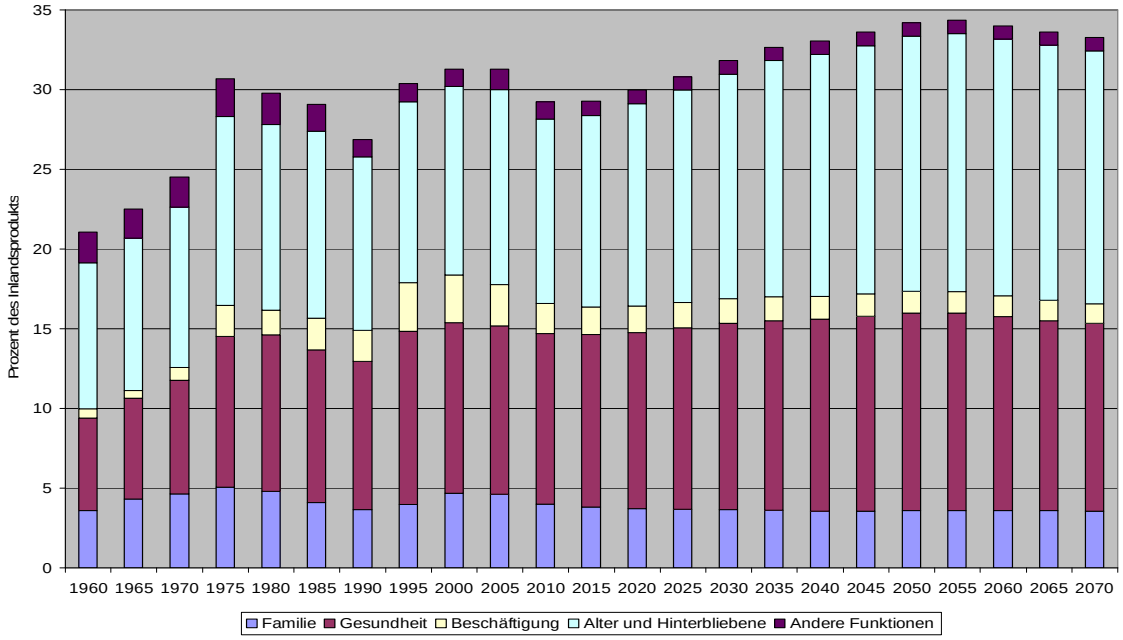
Die folgende Sequenz von Grafiken (2a, 2b, 2c) stellt die oben aufgezeigte summarische Entwicklung nach den einzelnen grossen Ausgabenblöcken des SB dar:

Grafik 2a. Entwicklung der Sozial*leistungs*quote nach Komponenten von 1960 bis 2070 – Basisvariante



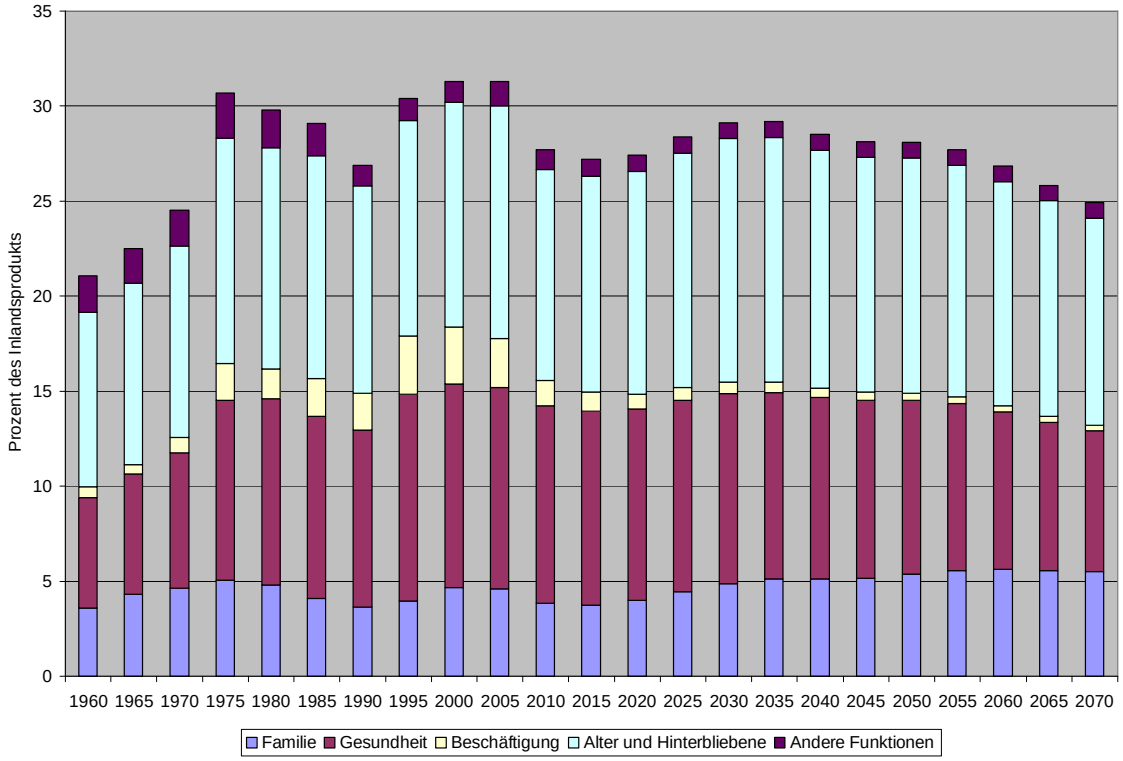
Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b*].

Grafik 2b. Entwicklung der Sozial*leistungs*quote nach Komponenten von 1960 bis 2070 – Pessimistisches Szenario



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-p*].

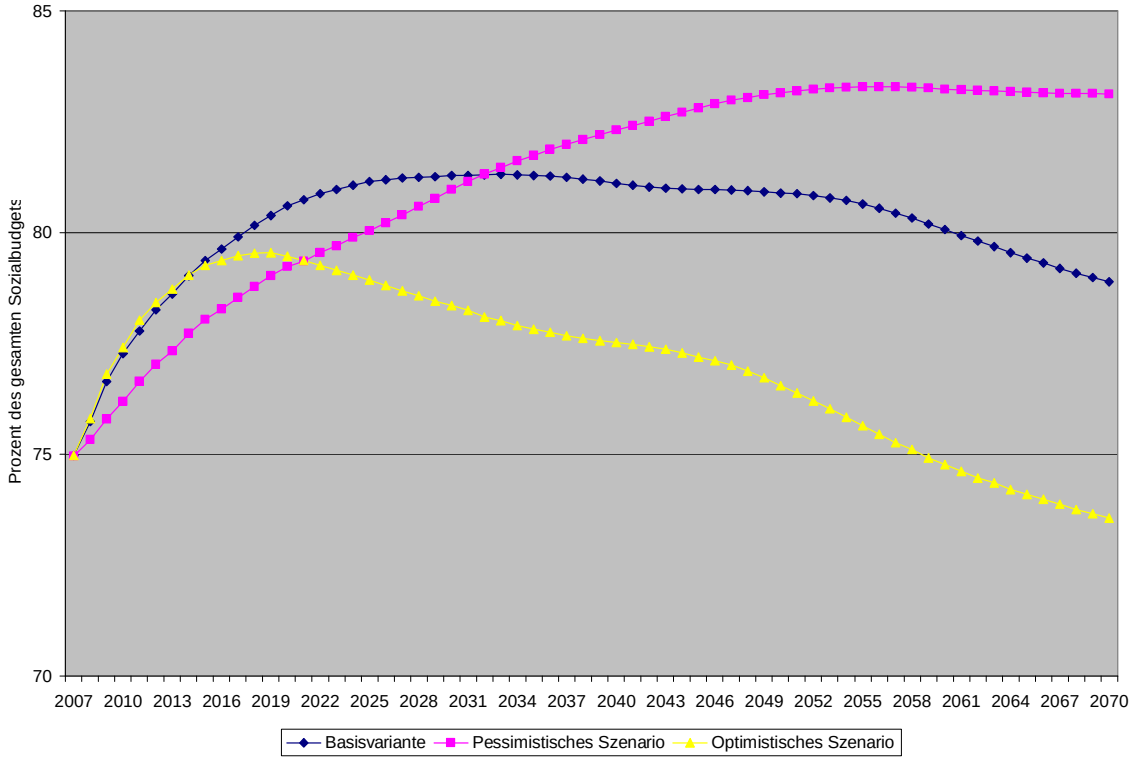
Grafik 2c. Entwicklung der Sozial*leistungs*quote nach Komponenten von 1960 bis 2070 – Optimistisches Szenario



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-o*].

Die drei Varianten implizieren erheblich unterschiedliche Entwicklungen des finanziellen Gewichts des jeweiligen Politikbereichs: während in der Basisvariante die beiden seit je her in Deutschland (wie auch international) dominierenden Bereiche Gesundheit und Alter mit einem Anteil von z. Z. etwa 75 Prozent am Gesamtbudget auch langfristig dominieren und auf etwa 80 Prozent des SB zunehmen, sinkt dieser Anteil im optimistischen Szenario, nach vorübergehendem Anstieg, deutlich auf unter 75 Prozent ab und gibt sozusagen Raum für Leistungsverbesserungen oder Praeferenz für andere sozialpolitische Bereiche; im pessimistischen Szenario steigt der Anteil der beiden dominierenden Programme langfristig auf fast 85 Prozent Anteil am SB an. (Grafik 3)

Grafik 3. Anteil der Funktionen «Gesundheit» und «Alter und Hinterbliebene» am Gesamtbudget



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart5*].

Uebersicht 1 zeigt anhand qualitativer Indikatoren die langfristig zu erwartenden relativen Veränderungen der finanziellen Gewichte der vier wichtigsten Politikbereiche des Sozialbudgets. (siehe auch Tabellen 4d bis 4f im Anhang)

Uebersicht 1. Langfristige Veränderung des finanziellen Gewichts der wichtigsten sozialpolitischen Politikfelder (im Vergleich zu den je anderen Szenarien)

Politikfeld	Basisvariante	Pessimistisches Szenario	Optimistisches Szenario
Familie	+	- -	+ +
Gesundheit	**0**	+ +	- -
Beschäftigung	-	+ + +	- - -
Alter und Hinterbliebene	**0**	+ +	- -

Quelle: IAA.

Lesehilfe zu Uebersicht 1:

0	Politikfeld *behält* sein finanzielles Gewicht langfristig
+	Politikfeld *erhöht* sein finanzielles Gewicht langfristig
+ +	Politikfeld erhöht sein finanzielles Gewicht langfristig *stark*
+ + +	Politikfeld *erhöht* sein finanzielles Gewicht langfristig *sehr stark*
-	Politikfeld *reduziert* sein finanzielles Gewicht langfristig
- -	Politikfeld *reduziert* sein finanzielles Gewicht langfristig stark
- - -	Politikfeld reduziert sein finanzielles Gewicht langfristig *sehr stark*

jeweils *im Vergleich zu den beiden anderen Szenarien.*

Die Einnahmen des Sozialbudgets

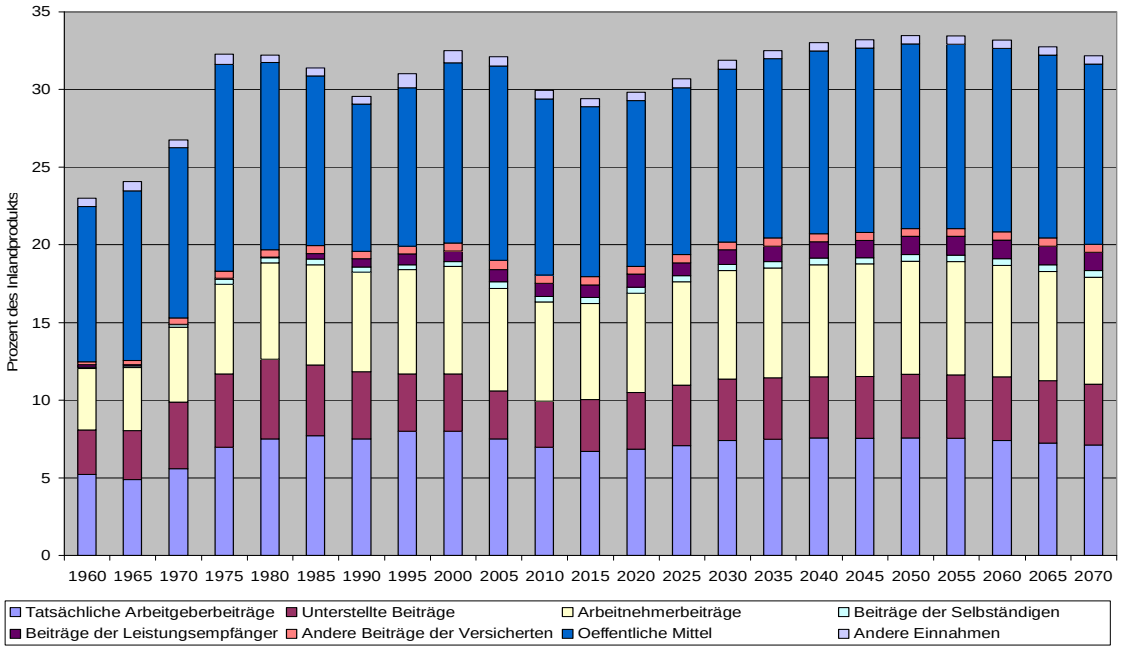
Die Einnahmenstruktur des Sozialbudgets stellt die spezifisch drittelparitätische Finanzierungsphilosophie des deutschen Sozialstaats in besonders deutlicher Weise dar. Wie Deutschland konzentrieren mehr oder weniger alle Länder, die über eine nennenswerte Sozialgesetzgebung verfügen, diese auf die Bereiche Gesundheit, Alterssicherung, Familienleistungen und finanziell weniger wichtige Bereiche (wie Arbeitslosigkeit oder einzelfallorientierte Armutsvermeidung); die relativen Gewichte der Einzelbereiche sind dann auch denjenigen des deutschen Sozialbudgets nicht unähnlich. Auf der Finanzierungsseite gibt es z.T. aber doch deutliche Unterschiede, die manchmal, keineswegs immer, durch das politische Ziel zu erklären sind, die gesamtwirtschaftlichen Produktionsfaktoren anders mit den Kosten der sozialen Sicherung zu belasten als dies in Deutschland der Fall ist.

Tatsächlich wurde das deutsche Sozialbudget in der Vergangenheit in etwa zu je einem Drittel aus Versichertenbeiträgen, Arbeitgeberbeiträgen und staatlichen Zuschüssen finanziert. Dabei ist der Anteil der Arbeitgeberbeiträge an der gesamten Finanzierung des Sozialbudgets in den letzten Jahren etwas zurückgegangen, während die Versichertenbeiträge in etwa stabil blieben (beides entgegen dem europäischen Trend) und die öffentlichen Zuschüsse relativ zunahmen.

Es wird angemerkt, dass das deutsche Sozialbudget in der Vergangenheit immer einen positiven Finanzierungssaldo (Ueberschuss) aufwies. Nach den auf unseren demographischen und ökonomischen Annahmen beruhenden Berechnungen verfügt das Sozialbudget auch in Zukunft immer über ausreichende Einnahmen, deren Niveau dem vorausgeschätzten Ausgabenniveau folgt. Dabei liegt die Sozial*einnahmen*quote immer mindestens etwa ½ bis 1½ Prozentpunkte höher als die Leistungsquote. Insofern wird auf die Ausführungen zur Sozial*leistungs*quote verwiesen (s.o.).

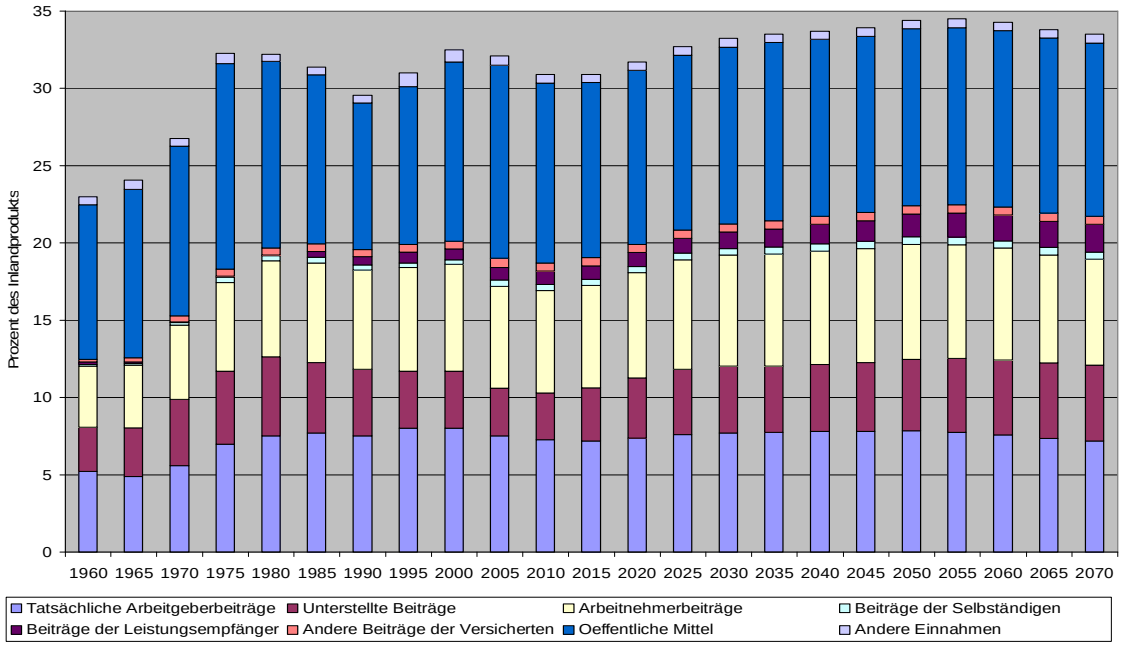
Einen Ueberblick zur langfristigen Einnahmenentwicklung nach Struktur und Dynamik vermittelt die folgende Sequenz von Grafiken (3a, 3b, 3c):

Grafik 3a. Entwicklung der Sozial*einnahmen*quote nach Komponenten von 1960 bis 2070 – Basisvariante



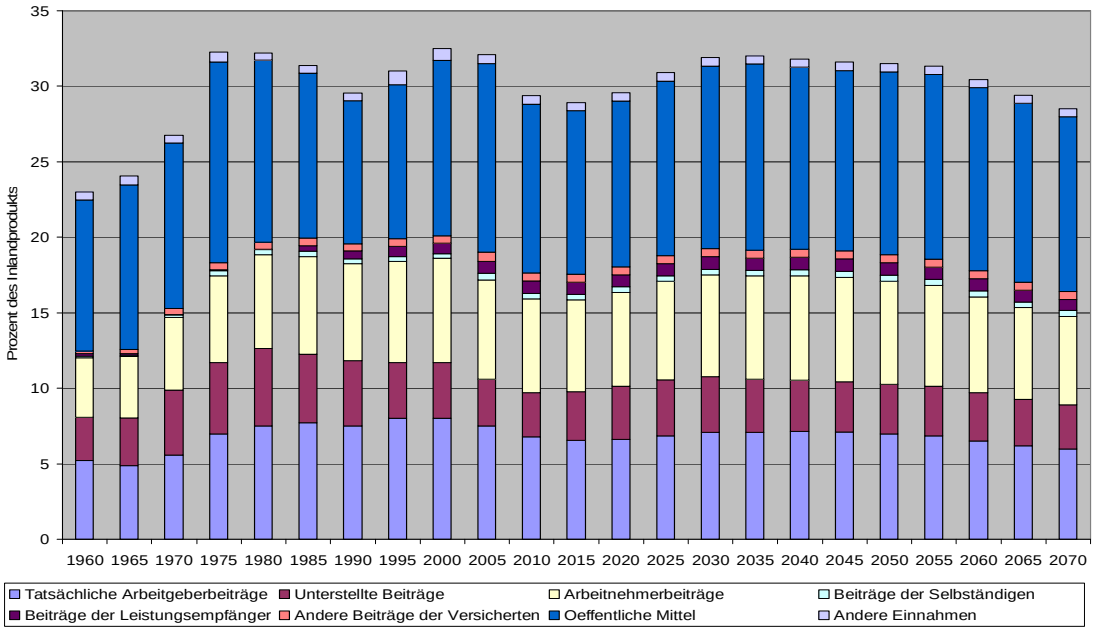
Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart6*].

Grafik 3b. Entwicklung der Sozial*einnahmen*quote nach Komponenten von 1960 bis 2070 – Pessimistisches Szenario



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart7*].

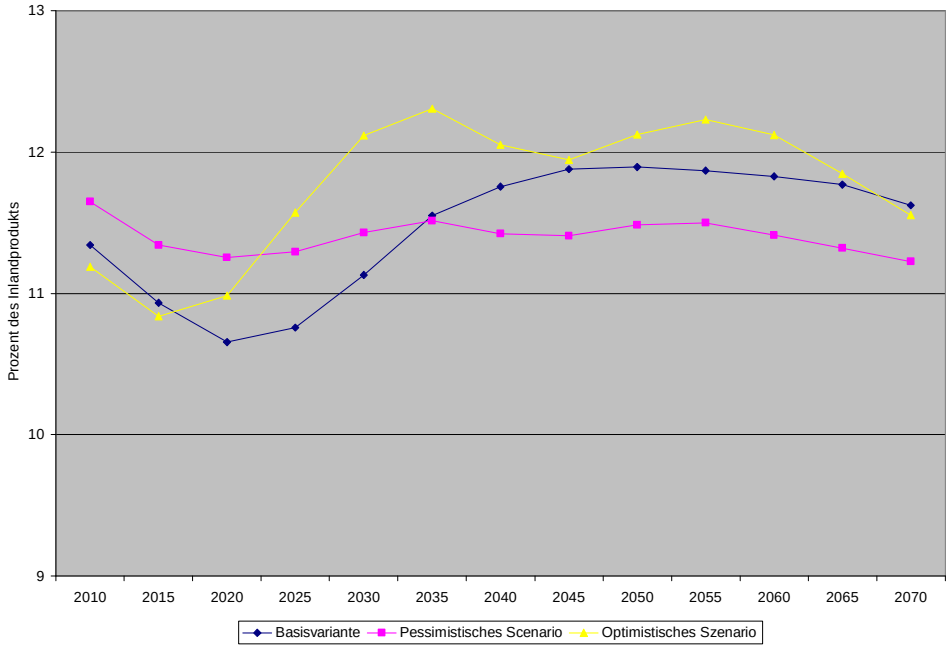
Grafik 3c. Entwicklung der Sozial*einnahmen*quote nach Komponenten von 1960 bis 2070 – Optimistisches Szenario



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart8*].

Dabei verharren die staatlichen Zuschüsse an das Sozialbudget bei etwa 11 bis 12 Prozent des BIP, zeigen aber, je nach Szenario deutlich unterschiedliche Dynamiken im Detail, die (im wesentlichen) nur aus dem Zusammenspiel der Zuschuesse an die allgemeinen Systeme (GRV, GKV) und der steuerfinanzierten familienpolitischen Leistungen, die jeweils von den gesetzten Rahmenannahmen (Demographie, Oekonomie, Arbeitslosigkeit) stark abhängig sind, erklärt werden können (Grafik 4).

Grafik 4. Entwicklung der staatlichen Zuschüsse an das Sozialbudget – Alle Szenarien



Quelle: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart9*].

Ergebnisinterpretation: Leistungen des Sozialbudgets

Aus makro-fiskalischer und makro-ökonomischer Perspektive sind die Ergebnisse unspektakulär: bezieht man sich auf die Basis- bzw. pessimistische Variante, so wird die Sozialleistungsquote der Bundesrepublik Deutschland auch weiterhin um ein Niveau von etwas über 30 Prozent schwanken, Werten also, die auch im Zeitraum 1975 bis 2005 durchaus üblich waren. Die gesamtwirtschaftlich erbrachte Leistung (BIP) wird also weiterhin zu erheblichen Teilen für sozialpolitische Einkommens- und Sachleistungen verwendet; und sie wird weiterhin in einem Ausmass für solche Zwecke verwendet, mit dem die deutsche Volkswirtschaft in der Vergangenheit gut zurecht gekommen ist. Im optimistischen Szenario geht die Sozialleistungsquote zurück, was Möglichkeiten eröffnen könnte, bei günstiger Bevölkerungsstruktur und anhaltend positiver wirtschaftlicher Entwicklung Leistungen zu verbessern.

Auch zeigen unsere Ergebnisse keine fundamentalen Ungleichgewichte zwischen demographischer Entwicklung und der Allokation von Leistungen. Mit anderen Worten, die Resourcen des Sozialbudgets werden angemessen auf diejenigen Altersgruppen verteilt, die sie benötigen. Um dies näher zu untersuchen, wurde das Sozialbudget mittels Hilfsrechnungen den Altersgruppen 0 bis 19 Jahre, 20 bis 64, und 65+ (Tabelle 1) zugewiesen, wobei die Gruppe der

- 0 bis 19jährigen diejenigen Personen repräsentiert, die speziell auf Familien- und verwandte Leistungen,
- 65+ diejenigen, die speziell auf Alterseinkünfte angewiesen sind, und
- die Gruppe der 20 bis 64jährigen diejenigen repräsentiert, die das gesamtwirtschaftliche Einkommen (BIP) erzeugen.

Alle Gruppen konsumieren, mit unterschiedlicher Intensität, Gesundheitsleistungen (chapter 4).

Die angewandte Methode erlaubt es, die Nettosoziallast der «aktiven» Gruppe der 20 bis 64jährigen abzuschätzen. Die Nettosoziallast is definiert als die Sozialleistungsquote minus derjenige Anteil des Sozialbudgets (in Prozent des BIP), der den Aktiven zufliesst. Die Nettosoziallast repräsentiert dann denjenigen Betrag, der tatsächlich von den Aktiven zu den Nicht-Aktiven umverteilt wird, den sie also im Rahmen der Sozialgesetzgebung vom erzeugten Gesamtprodukt «abgeben».

Es is uns bewusst, dass die Wahl der drei Gruppen einer gewissen Willkür unterliegt; z.B. werden Familienleistungen auch an Personen gezahlt, die älter als 19 Jahre sind und Altersrenten werden auch an Personen gezahlt, die jünger sind als 65 Jahre. Entsprechend enthält unser Ansatz starke normative Elemente, die Antworten auf Fragen wie «Wie sähe die Altersallokation des Sozialbudgets aus wenn *alle* Leistungen mit einer ausschliessenden Altersbedingung (der gewählten Art) gezahlt würden?» Insofern, als die Zahlung von Leistungen in Wirklichkeit von den gewählten Altersgruppierungen abweicht, sind unsere Ergebnisse unscharf. Dennoch glauben wir, dass die Ergebnisse sinnvoll sind, als (1) die genannte Unschärfe in vielen Fällen nicht sehr gross sein dürfte und (2) die Regierung bereits Schritte unternommen hat, Leistungen stärker auf die genannten Altersgruppen zu fokussieren (Beispiele sind: Familienleistungen (Kindergartenplätze); Beschäftigung (Reduzierung von Arbeitsmarktmassnahmen); Alter (Anhebung des Rentenalters)). Hinsichtlich der Allokation von Gesundheitsleistungen auf Altersgruppen basieren unsere Schätzungen auf detaillierten Informationen über die Nutzungsraten des Gesundheitssystems durch die Bevölkerung nach Altersgruppen.

Unsere Berechnungen zeigen, dass zwischen 2010 und 2040, d.h. während der Periode grösster demographischer Veränderung:

- Im Basisszenario sowohl Nettosoziallast als auch der Anteil der Bevölkerung in den Gruppen 0 bis 19 und 65+ um 26 Prozent zunehmen;

- Im pessimistischen Szenario, die Nettosoziallast um 28 Prozent und der Anteil der auf Sozialtransfers angewiesenen Bevölkerung (0 bis 19 und 65+) um 24 Prozent zunehmen;

- Im optimistischen Szenario, die Nettosoziallast um 15 Prozent zunimmt und der darauf angewiesene Bevölkerungsanteil um 27 Prozent.

Mit anderen Worten: sowohl im Basis- wie auch im pessimistischen Scenario nehmen die relativen Sozialleistungen mit dem Anteil der auf sie besonders angewiesenen Personen in etwa parallel zu; das Ergebis im optimistischen Szenario bestätigt, dass bei Eintreffen seiner demographischen und ökonomischen Annahmen Spielraum für Leistungsverbesserungen bestünde (Uebersicht 2). Hinsichtlich weiterer Details wird auf die Tabellen 4q bis 4s im Annex verwiesen.

Tabelle 1. Sozialbudget nach Altersgruppen – drei Szenarien

Jahr	2010	2020	2030	2040	2050	2060	2070
Basisszenario	**Basisszenario**						
	Durch Sozialbudget umverteiltes BIP nach Altersgruppen						
SB verteilt auf Altersgruppe 0-19	4.1	3.7	3.9	4.3	4.4	4.6	4.6
SB verteilt auf Altersgruppe 20-64	8.4	7.3	6.7	6.3	6.1	5.9	5.8
SB verteilt auf Altersgruppe 65+	15.7	17.2	19.5	21.0	21.3	20.5	19.0
SB insgesamt in Prozent des BIP	28.2	28.0	29.9	31.3	31.6	30.7	29.2
Nettosoziallast der Altersgruppe 20 bis 64	*19.9*	*20.8*	*23.2*	*25.0*	*25.5*	*24.8*	*23.5*
	Altersgruppen in Prozent der Bevölkerung						
Altersgruppe 0-19 in Prozent der Gesamtbevölkerung	18.6	16.9	16.8	17.6	18.1	18.9	19.9
Altersgruppe 20-64 in Prozent der Gesamtbevölkerung	60.9	60.1	54.8	50.7	49.6	49.5	50.3
Altersgruppe 65+ in Prozent der Gesamtbevölkerung	20.5	23.0	28.4	31.7	32.3	31.5	29.8
Gesamtbevölkerung	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Bevölkerung in den Altersgruppen 0 - 19 und 65+	*39.1*	*39.9*	*45.2*	*49.3*	*50.4*	*50.5*	*49.7*
Pessimistisches szenario	**Pessimistisches szenario**						
	Durch Sozialbudget umverteiltes BIP nach Altersgruppen						
SB verteilt auf Altersgruppe 0-19	4.2	3.9	3.8	3.6	3.6	3.6	3.6
SB verteilt auf Altersgruppe 20-64	8.9	8.3	7.7	7.2	7.0	6.8	6.6
SB verteilt auf Altersgruppe 65+	16.1	17.8	20.4	22.3	23.6	23.6	23.1
SB insgesamt in Prozent des BIP	29.2	30.0	31.8	33.1	34.2	34.0	33.3
Nettosoziallast der Altersgruppe 20 bis 64	*20.3*	*21.7*	*24.1*	*25.9*	*27.2*	*27.2*	*26.7*
	Altersgruppen in Prozent der Bevölkerung						
Altersgruppe 0-19 in Prozent der Gesamtbevölkerung	18.6	16.8	15.6	14.5	14.0	13.9	13.9
Altersgruppe 20-64 in Prozent der Gesamtbevölkerung	60.9	59.9	55.1	51.6	50.4	49.7	49.9
Altersgruppe 65+ in Prozent der Gesamtbevölkerung	20.5	23.3	29.3	33.9	35.7	36.3	36.2
Gesamtbevölkerung	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Bevölkerung in den Altersgruppen 0 - 19 und 65+	*39.1*	*40.1*	*44.9*	*48.4*	*49.6*	*50.3*	*50.1*
Optimistisches szenario	**Optimistisches szenario**						
	Durch Sozialbudget umverteiltes BIP nach Altersgruppen						
SB verteilt auf Altersgruppe 0-19	4.1	4.1	4.9	5.0	5.2	5.4	5.2
SB verteilt auf Altersgruppe 20-64	8.2	7.1	6.5	6.0	5.9	5.6	5.4
SB verteilt auf Altersgruppe 65+	15.5	16.2	17.8	17.5	17.0	15.9	14.3
SB insgesamt in Prozent des BIP	27.7	27.4	29.1	28.5	28.1	26.9	24.9
Nettosoziallast der Altersgruppe 20 bis 64	*19.5*	*20.3*	*22.6*	*22.5*	*22.2*	*21.2*	*19.5*
	Altersgruppen in Prozent der Bevölkerung						
Altersgruppe 0-19 in Prozent der Gesamtbevölkerung	18.6	18.9	21.3	21.9	22.8	24.4	24.8
Altersgruppe 20-64 in Prozent der Gesamtbevölkerung	61.0	59.1	52.8	50.4	50.4	50.5	52.5
Altersgruppe 65+ in Prozent der Gesamtbevölkerung	20.4	22.1	25.9	27.7	26.8	25.2	22.7
Gesamtbevölkerung	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Bevölkerung in den Altersgruppen 0 - 19 und 65+	*39.0*	*40.9*	*47.2*	*49.6*	*49.6*	*49.5*	*47.5*

Source: Deutschlandmodell; siehe auch Tabellen 4q bis 4s im Annex.

Ergebnisinterpretation: Finanzierung des Sozialbudgets

Wegen der unterstellten zurückgehenden Arbeitslosigkeit wird der Beitragssatz zur Arbeitslosenversicherung mittelfristig deutlich zurückgehen; im pessimistischen Szenario wird er allerdings auf einem Niveau zwischen 3½ und 4 Prozent verharren.

Die Finanzierung der gesetzlichen Rentenversicherung wurde unter der Annahme berechnet, dass keine Anhebung des Beitragssatzes über 22 Prozent des beitragspflichtigen Entgelts hinaus erfolgt; dies hat, über die gesetzliche Rentenapassungsformel stabilisierende Wirkungen auf das Rentenniveau und bewirkt gleichzeitig höhere Bundeszuschüsse, die ein Teil aller ins Sozialbudget fliessenden öffentlichen Mittel sind.

Unter der Annahme, dass der Bundeszuschuss zur GKV entsprechend der gesamtwirtschaftlichen Entwicklung dynamisiert wird, zeigt der GKV Beitragssatz eine mittel- bis langfristig kaum zu vermeidende Aufwärtstendenz, die allerdings in beherrschbarem Rahmen bleibt und nicht zuletzt durch die implizit unterstellte Annahme einer stetigen Verbesserung der Leistungen des Gesundheitssystems relativiert wird. Ein ähnliches Ergebnis stellt sich für die PflV ein. Nur im optimistischen Szenario ist eine Tendenz zu allgemein fallenden Beitragssätzen bei der GKV (und PflV) zu erkennen.

Uebersicht 2 enthält eine Zusammenstellung der Beitragssatzentwicklungen in allen drei Szenarien.

Uebersicht 2. Beitragssätze der Allgemeinen Systeme – drei Szenarien

Jahr	Basisvariante				Optimistisches Szenario				Pessimistisches Szenario			
	GRV	GKV	PflV	BA	GRV	GKV	PflV	BA	GRV	GKV	PflV	BA
	Prozent des beitragspflichtigen Entgelts											
2010	19.9	14.9	2.1	2.4	18.9	15.0	2.1	2.1	20.0	15.0	2.1	3.7
2020	19.9	14.7	2.4	1.8	19.4	14.6	2.3	1.1	20.8	14.9	2.4	3.5
2030	22.0	15.6	2.5	1.9	20.6	14.6	2.3	0.9	22.0	16.3	2.6	3.7
2040	22.0	16.2	2.7	2.0	21.4	15.2	2.5	0.9	22.0	17.5	2.9	3.9
2050	22.0	16.7	3.0	2.0	21.1	15.2	2.7	0.9	22.0	18.0	3.3	4.0
2060	22.0	16.6	2.7	2.0	20.3	15.7	2.5	0.9	22.0	18.0	3.0	4.3
2070	22.0	16.0	2.2	2.1	18.9	15.7	2.1	1.1	22.0	17.8	2.5	4.7

Quelle: Deutschlandmodell.

Deutlich wird, dass bei gegebener Entwicklung der Bevölkerungsstruktur die Höhe der Beitragssätze von der wirtschaftlichen Entwicklung, und hierbei insbesondere von der Höhe und dem Beschäftigungsgrad des langfristigen Arbeitsangebots, abhängig ist, das im optimistischen Szenario besonders dynamisch zunimmt (bei gleichzeitig höherer Arbeitsproduktivität).

Unter den gegebenen Resultaten für die Beitragssätze werden die Staatszuschuesse bei der GRV entsprechend Gesetz bzw. (in der Phase des angenmommenen maximalen Beitragssatzes von 22 Prozent [vgl. Uebersicht 2]) durch zusätzliche Steuermittel, in der GKV entsprechend Annahme angehoben;[34] desweiteren werden die Staatszuschüsse im Sozialbudget stark durch die familienpolitischen Leistungen mitbestimmt, die im wesentlichen von den, je nach Szenario, unterschiedlichen Kinder- und Jugendlichenzahlen abhängen. Im Vergleich zur gesamtwirtschaftlichen Leistung (BIP) bleiben die aggregierten Staatszuschüsse langfristig insgesamt moderat, sodass für die Staatshaushalte[35] zusammengenommen solange keine besonderen Finanzierungsprobleme

[34] Bei der BA fallen keine Zuschüsse zur Defizitdeckung an. ALG2 wird aus Steuermitteln finanziert, geht aber mit der Arbeitslosigkeit in allen drei Varianten zurück (einschl. dem pessimistischen Szenario).

[35] Haushalte von Bund und Ländern.

auftreten sollten wie sich ihre Einnahmen am laufenden Inlandsprodukt orientieren. Auf Grafik 4 wird verwiesen (s.o.). [36]

Im Ergebnis wird sich somit die Einnahmenstruktur des Budgets, aufs Ganze gesehen, im Vergleich zur bisherigen Entwicklung seit der Wiedervereinigung nicht wesentlich ändern; die drittelparitätische Organisation des deutschen Sozialstaats spiegelt sich auch künftig in den Einnahmen des Sozialbudgets.

Auffällig ist jedoch die gravierende Diskrepanz zwischen gesetzlichen Beitragssätzen und den tatsächlich von Arbeitgebern und Arbeitnehmern gezahlten Beiträgen in Prozent der gesamtwirtschaftlichen Leistung (Uebersicht 3).

Uebersicht 3. Tatsächliche Arbeitgeber- und Arbeitnehmerbeiträge in Prozent des BIP – drei Szenarien

Jahr	Tatsächlich gezahlte Sozialbeiträge								
	Summe	Arbeit-geber	Arbeit-nehmer	Summe	Arbeit-geber	Arbeit-nehmer	Summe	Arbeit-geber	Arbeit-nehmer
	Basisscenario			Optimistisches Szenario			Pessimistisches Szenario		
	%								
2010	13.4	7.0	6.4	13.0	6.8	6.2	13.9	7.3	6.6
2020	13.3	6.9	6.4	12.9	6.6	6.2	14.2	7.4	6.8
2030	14.6	7.5	7.1	13.9	7.1	6.8	15.0	7.7	7.2
2040	14.9	7.6	7.3	14.1	7.2	7.0	15.3	7.9	7.4
2050	15.0	7.6	7.3	13.9	7.0	6.9	15.4	7.9	7.5
2060	14.7	7.5	7.2	13.1	6.6	6.5	14.9	7.6	7.3
2070	14.1	7.2	7.0	12.0	6.1	6.0	14.2	7.3	6.9

Quelle: Deutschlandmodell

Selbstverständlich abstrahiert der Vergleich der Werte in den Uebersichten 2 und 3 von vielen strukturellen ökonomischen Aspekten und von Gestaltungsprinzipien der Finanzierung des deutschen Sozialstaats; jenseits aller methodisch möglichen Einschränkungen zeigt der Vergleich der beiden Tabellen aber, dass die Sozialversicherungsbeitragssätze nur auf einen relativ kleinen Teil der gesamtwirtschaftlich erzeugten Einkommen zugreifen und es daher letztlich nicht überrascht, dass sie unter den Bedingungen veränderter Arbeitsmärkte (die die gegebene Finanzierungsbasis relativ verengen) und Demografie (die erhöhte Leistungen erfordert) steigen.

Auswirkungen auf Lohnstueckkosten und Netto(real)löhne

Die Wirkung der Beitragssatzentwicklungen auf die gesamtwirtschaftliche *Arbeitskostenentwicklung* ist ausgesprochen gering. Im Vergleich zu einem hypothetischen Szenario, in dem die Arbeitgeberbeiträge, in Prozent der Durchschnittslöhne, langfristig konstant angenommen wurden, entwickeln sich die Lohnstückkosten in allen drei Szenarien nur unwesentlich schneller: in allen drei Varianten bewegt sich die Abweichung gegenüber dem hypothetischen Szenario im Bereich von maximal ein bis drei Zehntelpunkten; in der überwiegenden Zahl von Jahren sind die Abweichungen kaum messbar (nahezu null).

[36] Neben den familienpolitischen Leistungen und anderen direkten und indirekten Zahlungen enthält Grafik 4 auch die Zuschuesse an GRV, GKV sowie ALG2-Zahlungen.

Insgesamt bleibt die gesamtwirtschaftliche Lohnquote (Beschäftigteneinkommen in Prozent des Bruttoinlandprodukts) in allen drei Szenarien bei 50 Prozent oder knapp darunter.

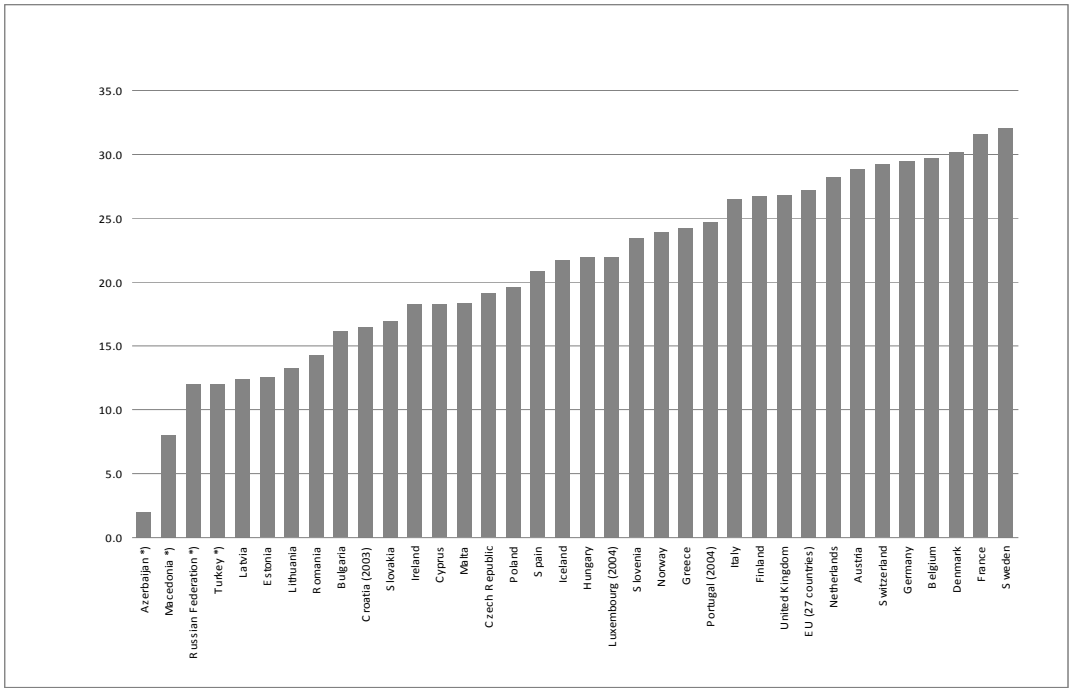
Bei angenommen konstanter Lohnsteuerquote der abhängig Beschäftigen wirken sich die simulierten Beitragssatzerhöhungen leicht dämpfend auf die *Nettolöhne* aus. Dabei ist insbesondere in der pessimistischen Variante nicht ausgeschlossen, dass die Nettoreallöhne über weite Perioden hinweg weiterhin, so wie in den vergangenen Jahren, negativ tendieren. Dies könnte insbesondere dann der Fall sein, wenn die GKV gezwungen sein sollte, von der Möglichkeit, Eigenbeiträge der Versicherten zu erheben, Gebrauch zu machen – ein Szenario, das nicht durchgerechnet wurde.

Schlussfolgerungen zur Leistungsseite des Sozialbudgets

Aus finanzwirtschaftlicher Sicht ist das deutsche Sozialbudget (auf der Ausgabenseite) konsolidiert. Leistungseinschränkungen mit dem Ziel zusätzlicher gesamtwirtschaftlicher Kosteneinsparungen erscheinen auf der Basis unserer Ergebnisse nicht notwendig und könnten insgesamt auch binnenwirtschaftlich kontraproduktiv sein. [37]

Zwar sind die öffentlichen Sozialausgaben Deutschlands im internationalen Vergleich durchaus hoch; in Europa gehört Deutschland zu den zwölf Ländern, deren Sozialleistungquoten bei 25 Prozent und darüber liegen (Grafik 5). Die national wie im internationalen Vergleich *produktivitätserhöhenden und einkommensstabilisierenden Wirkungen* dieser Leistungen (einschliesslich ihrer Finanzierung) dürfen aber nicht gering geschätzt werden.

Grafik 5. Sozialleistungsquoten im internationalen Vergleich, 2005



Quelle: EUROSTAT; *) IAA Schätzungen. [*Eurostat Total social protection.xls, Chart1*].

[37] International Labour Office: *Social protection as a productive factor*. Governing Body Geneva, 294th Session, November 2005 (Committee on Employment and Social Policy ESP, GB.294/ESP/4).

Damit könnten Gesellschaft und Politik jetzt auf die Rationalität der getroffenen Massnahmen vertrauen und sich das Sozialbudget im Kern so, wie durch die Gesetzgebung eingestellt, entwickeln lassen.[38] Insoweit als die Massnahmen zur Stärkung der Eigenvorsorge in den Bereichen Alterssicherung und Gesundheit sowie die arbeitsmarktpolitischen Weichenstellungen mittel- bis längerfristig eine gewisse positive Wirkung entfalten (was zu beurteilen nicht Gegenstand dieses Berichts ist), könnte sich diese Strategie gewissermassen selbst rechtfertigen und einen Kompromiss zwischen wirtschaftlichen und sozialen Notwendigkeiten vor dem Hintergrund der sich verändernden Bevölkerungsstruktur darstellen.

Weiter zeigen unsere Ergebnisse, dass auch künftig finanzieller Spielraum für Leistungsverbesserungen bestehen könnte. Jedenfalls signalisiert die langfristige Zunahme des relativen gesamtwirtschaftlichen Umverteilungsvolumens durch das Sozialbudget keineswegs eine Ueberschreitung ökonomisch tragbarer Grenzen. Mögliche Handlungsfelder sind die Bereiche der Sozialbudgetfunktionen Alter und Beschäftigung.

Leistungsverbesserungen könnten im Bereich der *Alterssicherung* notwendig werden um zunehmende Altersarmut, die längerfristig nicht ausgeschlossen erscheint, zu vermeiden. Dabei wäre aber eine Abkehr von der eingeleiteten Politik, öffentliche Alterssicherungsleistungen zunehmend auf die höheren Altersjahrgänge der Bevölkerung zu konzentrieren,[39] kontraproduktiv. Leistungsverbesserungen sollten sich vielmehr darauf konzentrieren, dass die aus veränderten Arbeitsmärkten sich vermutlich zunehmend ergebenden unterbrochenen Erwerbsbiografien nicht zu Altersrenten unterhalb des Sozialhilfeniveaus (oder eines normativ zu definierenden *darüber*liegenden Niveaus) führen. Um dies zu erreichen, könnte auch daran gedacht werden, die Rentenformel durch Einführung einer substantiellen, für alle Rentenbezieher gleichen Basiskomponente, die mit der Preisentwicklung zu indexieren wäre, zu reformieren. Eine solche Reform müsste wegen der in Alterssicherungssystemen zu honorierenden üblicherweise langen Uebergangsfristen rasch in Angriff genommen werden, um ihre positiven Wirkungen für die jetzt in die Arbeitsmärkte eintretenden Personengruppen entfalten zu können.

Im Bereich der *Funktion Beschäftigung* könnte die Implementierung des *flexicurity* Konzepts einen Ausgleich zwischen den zeitlichen, räumlichen sowie ausbildungs- und kenntnisbezogenen Flexibilitätserfordernissen der Wirtschaft mit den Einkommenssicherheitsbedürfnissen der Beschäftigten herstellen (chapter 6). Eine solche Reform ist selbstverständlich primär «strukturell», wäre aber für sich genommen nicht kostenfrei zu haben; sie würde das in der Sozialbudgetfunktion Beschäftigung dokumentierte Umverteilungsvolumen nicht zuletzt deswegen erhöhen, weil (i) die ausserhalb der eigentlichen Beschäftigungszeiten gezahlten Einkommen deutlich über den jetzigen Arbeitslosengeldsätzen lägen (dies wäre sozusagen das pekuniäre gesellschaftliche Zugeständnis an die Beschäftigeten für deren höhere Flexibilität) und (ii) die zur Durchführung des *flexicurity* Konzepts vorzuhaltende (öffentliche) Infrastruktur nicht unerheblich wäre, da das flexicurity Konzept eine enge Verzahnung von Arbeitsplatzanbietern und –nachfragern sowie das Vorhalten von (öffentlichen) Ausbildungskapazitäten erfordert. Unter dem Aspekt der Finanzierung des Sozialbudgets ist das Konzept besonders deswegen interessant als es, je nach Ausgestaltung, *trotz sich*

[38] Die im Bereich der GKV vorgesehenen Massnahmen wurden in unseren Berechnungen – soweit die Wirkungen quantitativ greifbar erscheinen – berücksichtigt.

[39] Unsere Berechnungen zur künftigen Entwicklung des Rentenbestandes belegen, dass diese Politik unter den gegebenen gesetzlichen Regeln effektiv greifen wird.

flexibilisierender Arbeitsmärkte stetige Beitragszahlungen der Beschäftigten über ihre je individuellen aktiven Lebenszyklen garantieren würde. [40]

Schlussfolgerungen zur Finanzierungsseite des Sozialbudgets

Unabhängig davon, welcher der beiden obigen Schlussfolgerungen zur Leistungsseite des Budgets man nachgeht, in beiden Fällen stellt sich die Frage einer Finanzierungsreform des Sozialbudgets.

Der Grund für diese Einschätzung liegt letztlich in der Unsicherheit über die zukünftige Entwicklung der Struktur des deutschen Arbeitsmarktes in seiner Interdependenz mit anderen Märkten in einer globalisierten Welt.

Könnte man mit einiger Sicherheit davon ausgehen, dass die gesetzten Beschäftigungsannahmen unserer Modellrechnungen, hierunter insbesondere die Annahmen über die Zahler von Beiträgen aus Primäreinkommen, tatsächlich eintreffen, so könnte man die Beitragssatzentwicklung selbst im pessimistischen Szenario für durchaus vertret- und beherrschbar halten; aufs Ganze gesehen, ist ein sich über 40 Jahre aufbauendes Plus von 7 Beitragssatzpunkten nicht dramatisch, insbesondere wenn dies (i) aus zunehmend verbesserten Leistungen des Gesundheitssystems resultiert sowie (ii) dem demografischen Uebergang geschuldet ist, anschliessend sich also wieder Beitragssatzsenkungsspielräume eröffnen. Eine derartige Robustheit von Modellierungsannahmen erscheint heute aber insbesondere auch im Hinblick auf die Entwicklung der Arbeitsmärkte nicht länger gegeben.

Hinzu kommt, dass wir bei unseren Modellierungen angenommen haben, dass eine positive Korrelation zwischen Erhöhung des Rentenalters sowie Arbeitsangebot und Beschäftigung (Beitragszahlung) im Alter besteht; falls abweichend davon die Arbeitgeber weiterhin jugendliche Belegschaften bevorzugen sollten, dann ergäbe sich ein neues sozialpolitisches Problem, für das zusätzliche Resourcen bereitgestellt werden müssten. Ein anderes Problem hinsichtlich der Validität unserer Ergebnisse ergibt sich aus der Annahme «gesunden Alterns» im Gesundheitsmodell, aus welcher sich, bei nichteintreffen, auf längere Sicht modellendogen erheblicher zusätzlicher Ausgabendruck ergeben würde.

Desweiteren sind alle Ergebnisse stark von der Annahme (nominal) arbeitsproduktivitätsorientierter Lohnpolitik abhängig, die sich auf *alle* Beschäftigen bezieht. Würden Gewerkschaften und Arbeitgeberverbände eine solche Politik nicht gesamtwirtschaftlich verfolgen, sind die Ergebnisse unserer Berechnungen zur Beitragssatzentwicklung nicht zu halten, d.h. die Beitragssätze zur GRV wie auch zur GKV und PflV würden ansteigen, ohne dass höhere Leistungen gezahlt würden.

Schliesslich ist darauf hinzuweisen, dass die gesetzten Rahmenannnahmen in allen Varianten – selbst im pessimistischen Szenario – insoweit einen «optimistischen Bias» aufweisen, als sie von konjunkturellen Schwankungen oder grösseren wirtschaftlichen Strukturkrisen völlig abstrahieren. Solche Schwankungen und Krisen werden aber auch

[40] Es ist darauf hinzuweisen, dass das flexicurity Konzept nicht unumstritten ist. Als Alternative bieten sich Konzepte zur Stabilisierung und Mehrung beitragspflichtiger Beschaeftigungsverhaeltnisse an; das Konzept findet auch dort seine Grenzen, wo realwirtschaftlich an sich voll funktionsfaehige Volkswirtschaften durch exogene Einfluesse (etwa Fehlentwicklungen im Finanzsektor) in Krisen mit erheblichen strukturellen Verwerfungen am Arbeitsmarkt (Massenarbeitslosigkeit) getrieben warden.

künftig unmittelbare Auswirkungen auf die Finanzen des Sozialbudgets haben.[41] Simulationsrechnungen, wie sie für diesen Bericht durchgeführt wurden, können solche in der Wirklichkeit tatsächlich vorkommenden und auch künftig nicht auszuschliessenden Effekte nur schwer darstellen. Hinsichtlich der Nichtberücksichtigung eines expliziten Szenarios zur aktuellen globalen Finanzkrise wird auf die Ausführungen im Vorwort verwiesen.

Angesichts solcher Unsicherheiten erscheint es auch auf der Basis unserer Ergebnisse ratsam, über Finanzierungsgrundlagen des deutschen Sozialstaates nachzudenken, die für die nächsten Jahrzehnte potentiell robuster sind, als die bisherige überwiegende Fokussierung (lediglich) auf Teile des Arbeitseinkommens.

Finanzierungsalternativen

Als Finanzierungsalternativen stehen die folgenden Möglichkeiten zur Verfügung:

1. Einbeziehung zusätzlicher Primäreinkommensquellen in die Finanzierungsbasis des Sozialbdugets;

2. Abschaffung der Beitragsbemessungsgrenzen, da diese relativ egalitäre Primäreinkommensstrukturen widerspiegeln, die so nicht länger existieren, und in einer Welt zunehmender Primäreinkommensdisparitäten erheblich zum Anstieg der finanziellen Belastung der mittleren und niedrigen Lohneinkommen durch steigende gesetzliche Beitragssätze beitragen, während Bezieher von Einkommen oberhalb der Beitragsbemessungsgrenze gerade dadurch relativ entlastet werden;

3. Erhöhung des steuerfinanzierten Anteils der Sozialausgaben.

Beitragssatzsenkungspotentiale

Man kann erwarten, dass die genannten Massnahmen zusammengenommen ein *rechnerisch beachtliches Potential zur Senkung der gesetzlichen Beitragssätze* haben. Legt man als gesamtwirtschaftliche Finanzierungsgrundlage des Sozialbudgets das Volkseinkommen zugrunde, so würde der Gesamtbeitragssatz sowohl im Basis- wie auch im pessimistischen Szenario auf, im Maximum, etwas über 30 Prozent sinken – dabei ist angenommen, dass weiterhin etwa 1/3 aller Sozialausgaben aus Steuermitteln gedeckt würden. Unter der gleichen Annahme könnte sich der zusammengefasste Beitragssatz von Renten- Krankenversicherung auf etwa 25 Prozent reduzieren.

Es wird darauf hingewiesen, dass diese Beitragssatzabschätzungen nicht endogenes Ergebnis unserer Modelle sind,[42] sondern sich ohne Berücksichtigung der Nettoeffekte von

[41] Scholz, W., Drouin, A.: *Regular adjustment of financial parameters of social protection systems in volatile inflationary environments*. In: International Social Security Review, 1/98, Vol. 51, No. 1, 1998, pp. 47 to 71. Blackwell Publishers. Dieser Aufsatz beschreibt zwar eine extreme ökonomische Ausnahmesituation, in die soziale Sicherungssysteme geraten können; diese Ausnahmesituation tritt aber weltweit durchschnittlich jedes Jahr in ein oder zwei Ländern auf.

[42] Insbesondere sind die Beitragssatzabschätzungen also auch nicht Ergebnis der verwendeten Renten- und Gesundheitsmodelle.

wirtschaftlich relevanten Verhaltensänderungen[43] bei Gewinnern und Verlierern unter den Wirtschaftsakteuren (private Haushalte, Unternehmen), die von den unter 1. bis 3. genannten Massnahmen betroffenen wären, durch komparativ-statische Berechnungen ausserhalb der eingesetzten Modelle ergeben.[44] Auch ist anzumerken, dass es sich beim Volkseinkommen um eine statistische Grösse handelt während sich gesetzgeberisch belastbare Beitragssatzberechnungen auf Einkommensgrössen beziehen müssten, die der Abgabenverwaltung tatsächlich zugänglich sind. Schliesslich sind die vorgenommenen Abschätzungen *nur insoweit valide* als die genannten Massnahmen unter 1 bis 3 (im Vergleich zu status quo) ausgabenneutral, d.h. insbesondere ohne Mehrausgaben, verwirklicht werden könnten.

Rentenversicherung

Im Teilsystem Rentenversicherung ist eine Ausweitung der Finanzierungsgrundlagen unter Einhaltung der soeben genannten Bedingung der Ausgabenneutralitaet (gegenüber status-quo) nur möglich, wenn zwar zusätzliche Einkommen in die Finanzierung einbezogen, nicht aber neue Personenkreise Anspruch auf Leistungen erwerben würden; in der Vergangenheit sind hierzu Vorschläge unterbreitet worden die auf eine staerkere Orientierung an der gesamten Wertschoepfung, d.h. an Loehnen *und* Gewinnen, setzen; Fragen ihrer administrativen Durchführbarkeit scheinen inzwischen geklärt.[45] Auch dürften die zusätzlich einbezogenen Einkommen nicht zu höheren individuellen Ansprüchen der Versicherten führen, was wohl eine Lockerung des Prinzips der Aequivalenz zwischen individuell geleisteten Beiträgen und erhaltenen Leistungen erfordern würde, da Leistungsneutralität wohl nur (u.a.) durch die Einführung von Leistungsobergrenzen (z.B. Höchstrenten) garantiert werden könnte (z. B. könnte dies durch Umwidmung der Beitragsbemessungsgrenzen in *Leistungsbemessungsgrenzen* geschehen)[46]. Für die Arbeitslosenversicherung stellten sich die Probleme analog.[47]

[43] Zu Einbeziehung und potentiellem Ausmass solcher Effekte vgl. z. B. Fehr, Hans und Heinrich Jess (2006): Health premiums or health contributions? An evaluation of health care reform options in Germany. Schmollers Jahrbuch (126.), Heft 1, S. 21-57.

[44] Insoweit mag man die genannten Werte als Beitragssätze interpretieren, die sich in einem neuen Gleichgewicht nach Einführung der genannten Massnahmen ergeben würden – unter Vernachlässigung der durch die veränderten Anreizstrukturen ausgelösten Substitutionseffekte auf den Arbeits-, Kapital- und Gütermärkten.

[45] See, for exampleZum Beispiel: Bussmann, Ludwig, Walter A.S. Koch and Perygrin Warneke: *Der Wertschöpfungsbeitrag zur Finanzierung der gesetzlichen Rentenversicherung*. Campus. Frankfurt/New York, 1992.

[46] In der Praxis bedeutete dies, dass zur Finanzierung der Renten alle Primäreinkommen (bei reduziertem gesetzlichem Beitragssatz) herangezogen würden, diese Einkommen bei der Rentenberechung aber nur bis zur (heutigen) Beitragsbemessungsgrenze berücksichtigt würden. Auf der Leistungsseite würde sich *insoweit* also nichts ändern. Auf unseren obigen Vorschlag einer Reform der Rentenformel wird verwiesen.

[47] Die Einbeziehung weiterer *Personenkreise* in das allgemeine soziale Sicherungssystem ist allerdings dann sinnvoll, wenn ihre Zahl derart zunimmt, dass sie die existierenden Beitragszahler (Versicherten) relativ verdrängt und insoweit das allgemeine soziale Sicherungssystem sowohl auf der Finanzierungs- wie auch der Leistungsseite in Frage stellt.

Krankenversicherung / Pflegeversicherung

In der Krankenversicherung ist prinzipiell eine Lösung wie bei der Rentenversicherung denkbar. Mögliche Verhaltensreaktionen von Krankenversicherten und Gesundheitsdienstleistern können durch den Gesetzgeber zwar viel weniger klar abgeschätzt und kontrolliert werden als mögliche entsprechende Reaktionen in der Rentenversicherung. Daher sind Ausgabensteigerungen im öffentlich finanzierten Gesundheitsbereich als Reaktion auf eine Ausweitung der Finanzierungsgrundlagen nicht in gleicher Weise theoretisch ausschliessbar wie im Bereich der Rentenversicherung. Die Aufgabe, Kosten und Qualität bei den Dienstleistern des Gesundheitswesens zu kontrollieren und allen Bürgern gleichberechtigten Zugang zu modernen Gesundheitsleistungen zu garantieren, ist allerdings eine dauernde Aufgabe; es wird dabei erwartet, dass die die Einführung des Gesundheitsfonds 2009 begleitenden Probleme kurzfristiger Natur sind, er auf die lange Frist aber eine erhöhte Kosten- und Qualitätskontrollkompetenz im Gesundheitswesen bewirkt. Wir gehen daher davon aus, dass im Bereich der Funktion Gesundheit eine Verbreiterung der Finanzierungsgrundlagen durchaus möglich ist, ohne dass dadurch Leistungsausweitungen ausgelöst werden. Analoge Ueberlegungen gelten für die Pflegeversicherung.

Arbeitslosenversicherung / Funktion Beschäftigung

In der Arbeitslosenversicherung ist ein Absinken des Beitragssatzes absehbar. Eine Verbreiterung der Finanzierungsgrundlagen wäre wohl aus systematischen Gründen notwendig, wenn entsprechende Schritte in der Renten- und Krankenversicherung unternommen würden. Auch stellte sich die Frage neu, wenn das flexicurity Konzept realisiert würde. Es würde aus den o.g. Gründen unweigerlich zu Mehrausgaben – im Vergleich zu unseren Status-quo Berechnungen –, und damit (für sich genommen) zu einer Erhöhung der Sozialleistungquote führen. Anders als bei Ausweitung der Finanzierungsgrundlagen der Rentenversicherung, würden sich Fragen der Aequivalenz zwischen Beiträgen und Leistungen bei Realisierung des flexicurity Konzepts allenfalls nachrangig stellen.

Für künftige Reformen gut aufgestellt

Die obigen, auf unseren Berechnungen basierenden Darlegungen legen den Schluss nahe, dass nach den Konsolidierungsschritten der vergangenen zwei Jahrzehnte künftig Reformen, die (netto)[48] weitere Leistungs*einschränkungen* zum Ziel hätten, nicht notwendig sind.

Im Gegenteil, Leistungs*ausweitungen* (Erhöhung der Sozialleistungsquote) erscheinen finanziell möglich, sind aber prinzipiell so zu orientieren, dass sie Altersarmut vermeiden bzw. mit den erhöhten Einkommenssicherheitserfordernissen der Beschäftigten under den Flexibilitätserfordernissen der sich verändernden Arbeitsmärkte kompatibel sind.

Zunächst gilt es aber, sich auf die Reform der Finanzierungsseite zu konzentrieren. Zwar sind in der Realität des deutschen Sozialstaats Finanzierung und Leistung eng miteinander verwoben und insofern die Reform des einen nur schwer ohne eine Reform des anderen zu haben. Aber hier gilt es, alte Knoten zu durchschlagen.

[48] Prinzipiell nicht ausgeschlossen werden Reformen, in denen bisherige Leistungen abgeschafft und durch neue ersetzt werden; etwa könnte man prinzipiell an einen Ressourcentransfer von den «Alten» zu den «Jungen» denken.

Insgesamt befindet sich Deutschland dabei in einer durchaus vorteilhaften Ausgangslage im Vergleich zu Systemen, die ausschliesslich oder primär auf privater, finanzkapitalgedeckter Vorsorge beruhen: Die Leistungen aus dem deutschen Umlageverfahren sind einerseits durch den (wachsenden) gesamtwirtschaftlichen Kapitalstock mehrfach gesichert; gleichzeitig ist das Verfahren kurzfristigen gesetzlichen Eingriffen leicht zugänglich; d. h., der Gesetzgeber ist immer in der Lage, unmittelbar in das Leistungsniveau des sozialen Sicherungssystems einzugreifen – und zwar nicht nur konsolidierend, sondern, wenn notwendig, auch leistungsverbessernd.

Aus Sicht der IAO sind alle Reformen auf der Finanzierungsseite des Sozialbudgets zielführend, die auch in Zukunft garantieren, dass Deutschland seine Leistungsverpflichtungen aus den Uebereinkünften 102 und 128, und hierunter insbesondere diejenigen im Bereich der Alterssicherung, erfüllt. Dazu gehören prinzipiell auch Reformen, die zusätzliches privates Alterssparen auf kapitalgedeckter Basis solidarisch unterstützen, *falls* sie in Kombination mit den öffentlichen Alterssicherungssystemen die in den genannten Uebereinkünften definierten Mindeststandards garantieren. Insofern als die Erfordernisse aus den Uebereinkünften 102 und 128 zusätzliche gesamtwirtschaftliche Resourcen erfordern sollten, legen unsere Berechnungen den Schluss nahe, dass der notwendig Spielraum jedenfalls nicht durch die künftige Entgwicklung des Sozialbudgets (unter status quo) beschränkt wird.

1. Introduction

This report is based on comprehensive methodological, statistical, legal and policy information concerning Germany's social budget. Only where deemed necessary for a better understanding of our results we analyse and comment on past developments; in their main orientation, the results of this report aim to look into possible developments of Germany's social budget over the medium and long-term future. Statistical base year is 2005, partially 2006; we terminate the projections in 2070 in arguing that by then, latest, the ageing process of Germany's population, resulting from increasing longevity and reduced fertility, should have revealed its full potential dynamic and structural impacts on the social budget.

Much care was taken in order to make the long-term assumptions consistent with recent demographic, labour supply and economic developments. It must be understood, however, that the core assumptions had to be fixed during 2006/2007, with some few technical adjustments only made in early 2008. The nature of problems arising is well known to all modelers: at the time when the final comprehensive calculations with respect to the social budget could be undertaken some of the assumptions (e.g., in the area of demography, or medium term economic prospects) turned «outdated» and new statistical results had changed the basis from which to start. We solved the resulting consistency problems by taking into account as much information as possible and available at institutional level for the social budget, while calibrating, to the extent possible, the outer framework models (demography etc.) to most recent reality (= statistical time boundary). Still, almost all values shown in tables and charts for the years 2007 and 2008 are projections, not statistics; it can be assumed, however, that most of these values are close to actual developments.

Also, it must be emphasized that although we consider our macro-economic, demographic and other assumptions realistic within a possible range of outcomes, the results of our social budget calculations are basically of a «what-if»-nature and, accordingly, must be interpreted with the usual caveats. A number of specialists have been involved in the respective calculations and much care was taken by ILO-SEC/SOC in order to minimize possible inconsistencies and errors.

In line with ILO-SEC/SOC's social budgeting approach the following chapter 2, first, describes the demographic, labour supply and economic (incl labour demand) assumptions underlying the assumed set of three scenarios. In chapter 3 we present in greater detail the projected results for the single expenditure functions of the social budget – old-age and survivors, health, employment, family and others –, which is completed, in a separate section, by the results on the budget's revenue side. It follows, in chapter 4, an interpretation of the results under macro-economic aspects. In the next chapter 5, we present – and interpret – the results of a methodological and statistical experiment in which we allocate Germanys' social budget, tentatively, onto three age groups of the population; the results allow for additional insights and, so we hope, adds some fresh thought to Germany's general social policy discussion. We complement all findings with a final chapter 6, which draws a number of conclusions and adds some recommendations from the perspective of an international organization's department that has seen many social protection systems in distress and values high Germany's social protection system not only because of its benchmark function for other countries, in the past, but also, in its possible new (reformed) shape, in future.

The report contains annexes which are understood as integral parts of the overall report.

2. The assumed demographic, labour market and economic frames

The long-term calculations with respect to Germany's social budget finance (expenses, revenue) depend on two core sets of exogenous inputs: demographic assumptions, and economic assumptions. Labour market supply depends in the long run on the demographic development (level and structure of population), labour market demand on GDP growth (net investments, labour productivity).

For the purposes of this report it was agreed between ILO-SEC/SOC and the DGB to model Germany's social budget under three different scenarios, which – for convenience – have been tagged «pessimistic», «probable» and «optimistic» (Table 1). [49]

We consider the probable and pessimistic scenarios reflecting relatively well a corridor of presently prevailing outlooks of many economists and demographers on Germany's econo-demographic future; in comparison, the optimistic scenario might be considered an «outlier», especially with respect to its migration assumptions, as it goes well beyond public perceptions presently prevailing in Germany, and in Europe more generally. It must be stressed that the purpose of the undertaken calculations was *not* to assess most realistically future demographic and economic developments, but rather, to show the impact of different *possible* such developments on the German social budget under status-quo legislation. In order to make sure that the results for the social budget would sufficiently differ from each other, the three sets of scenario assumptions had, within acceptable limits, to be distinguished from each other as much as possible. We succeeded in doing so with respect to the optimistic scenario, less so however with respect to the probable and the pessimistic scenarios, which, in their outcomes, come relatively close.

Over most of the projection period the relative shares in GDP of the most important programs included in Germany's social budget follow similar development paths (with only small mutual deviations) under the pessimistic and the probable scenarios – demographic and economic assumptions more pessimistic (or more optimistic) than assumed would not add substantial insight to possible conclusions to be drawn and policies to be recommended. It is only in the optimistic scenario that, at the far end of the projection period (after around 2050), the financial situation of Germany's social budget tends significantly «lighter» than in the two other scenarios – i.e., only as of then more children, more immigration and higher productivity would substantially improve the financial situation of Germany's social protection system.

Meanwhile, taking most recent German migration statistics and the current international climate and energy debates into account, one might be inclined to calculate also «super-pessimistic» scenarios; we declined this option because we do not think that such calculations would add insight to the trends and problems of Germany's social budget, and to possible solutions.

The following sub-sections provide more explanations with respect to the assumptions made, and their interdependencies.

[49] Alternatively one might call the scenarios «low», «medium» and «high».

Table 2. Demographic and macro-economic assumptions for scenario modelling

Item		Pessimistic	Probable	Optimistic
		Scenario		
Demography				
Fertility	Births per 1000 women during re-productive period	Present value unchanged	Present value increases to 1800 (in 2025), then constant	to 2100 (in 2015), then constant
Net immigration	Persons per year	50 000	100 000	200 000
Growth components				
BIP per hour worked	Annual average growth rate	1.5	1.7	2.5
Working time	Hours per year	Decline beyond past trend	Past trend	Increase beyond past trend
Labour market				
Marginal jobs (incl. „1€" jobs)	Persons per year	Continued dynamics with ceiling at ~ 5.5 million	Continued dynamics with ceiling at ~ 5.5 million and reversal to target ~ below 3 million	~ less than 1 million
		Correlated with assumption on unemployment rate		
Unemployment rate	ILO definition	8	5	3
Wages	Real national average wage	Growth slightly below productivity	Growth identical with productivity	
Labour market participation rate	ILO definition	Male : female rates ~ 1 : 0.85	Male : female rates ~ 1 : 0.925	Male : female rates ~ 1 : 1
		Transition period dependent on UE rate		

Source: Deutschlandmodell.

2.1 Three population scenarios

The population projections are based on the following definition equation:

$$Pop_t = Pop_{t-1} - Deaths_{[t-1,t]} + Births_{[t-1,t]} + Nmig_{[t-1,t]}$$

Where

Pop_t =: Population in t,

Pop_{t-1} =: Population in t-1,

$Deaths_{[t-1,t]}$ =: Deaths between t-1 and t,

$Births_{[t-1,t]}$ =: Births between t-1 and t, and

$Nmig_{[t-1,t]}$ =: Net migration (= Immigration minus emigration) between t-1 and t.

The 101 × 1 population vector is being moved over time by single ages xi (i = 0, 1, 2, …, 100) and sex (male, female), where mortality and fertility rates create the deaths and the female and male children, respectively.

The projection results over the period 2006 to 2070 are steered by exogenously set assumptions on mortality rates (which determine life expectancy), fertility rates and net migration, which, except for mortality, vary with the three scenarios (see Table 1).

In more detail, the assumptions were set as follows.

Table 3. Assumptions for population model

			2005	2010	2020	2030	2040	2050	2070
Basic Scenario									
Life expectancy	Male	Years	76.2	76.8	78.0	80.5	82.1	83.5	85.0
at birth	Female	Years	82.1	82.9	84.2	85.5	86.8	88.0	90.0
Fertility rate		Children*)	1.37	1.37	1.37	1.80	1.80	1.80	1.80
Net immigration		1000	150	100	100	100	100	100	100
Optimistic Scenario									
Life expectancy	Male	Years	76.2	76.8	78.0	80.5	82.1	83.5	85.0
at birth	Female	Years	82.1	82.9	84.2	85.5	86.8	88.0	90.0
Fertility rate		Children*)	1.37	1.37	2.10	2.10	2.10	2.10	2.10
Net immigration		1000	150	200	200	200	200	200	200
Pessimistic Scenario									
Life expectancy	Male	Years	76.2	76.8	78.0	80.5	82.1	83.5	85.0
at birth	Female	Years	82.1	82.9	84.2	85.5	86.8	88.0	90.0
Fertility rate		Children*)	1.37	1.37	1.37	1.37	1.37	1.37	1.37
Net immigration		1000	150	50	50	50	50	50	50

Source: Deutschlandmodell. *) Per women during fertile life time.

While the future development of the German population's life expectancy is assumed to be scenario-neutral the two important sets of assumptions determining future long-term population growth are fertility and migration.

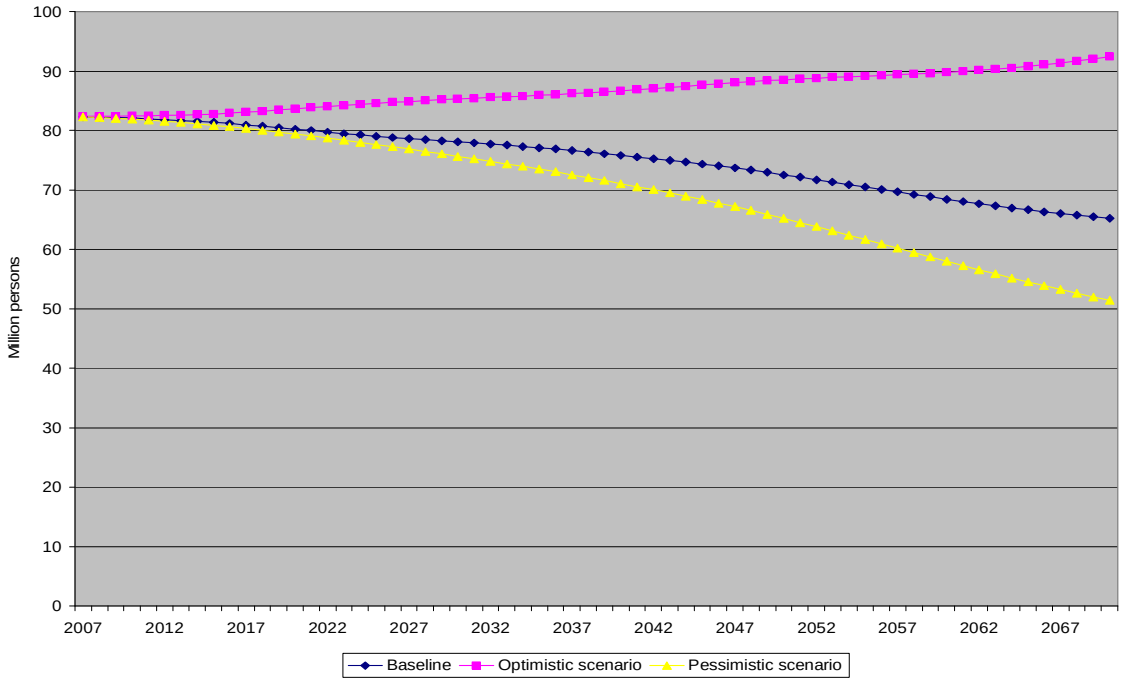
Fertility is set as follows: in the *basic scenario*, we assume that the fertility rate, which defines the average number of babies born per woman during her fertile life period of 35 years (from age 15 to age 49), remains at its present low level of around 1.4 over the next around 20 years and then increases to 1.8 – which is still below replacement (requiring a fertility rate of around 2.1).

In the *optimistic scenario*, the fertility rate bounces back, from present low levels, to replacement level, 2.1, within relatively short period of time, i.e. already in 2020.

The *pessimistic scenario* assumes that fertility rates remain at present low levels.

All projections start with the initial population of 82.477 million persons in 2005. In the baseline scenario the population declines to 65.2 million persons in 2070, in the pessimistic scenario to 51.4 million, and in the optimistic scenario it increases to 92.4 million persons (Figure 6).

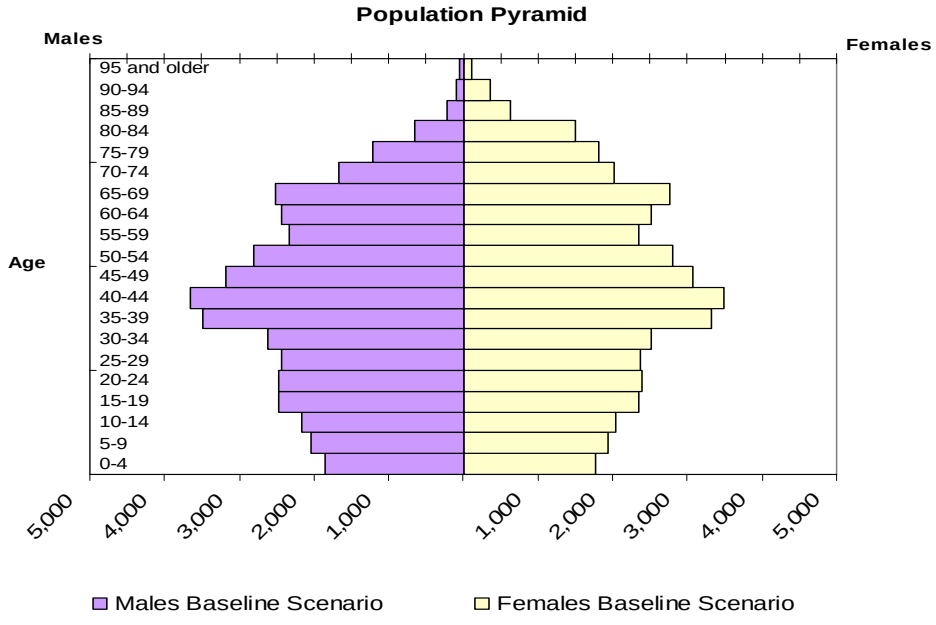
Figure 6. Population Germany; three scenarios



Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart7*].

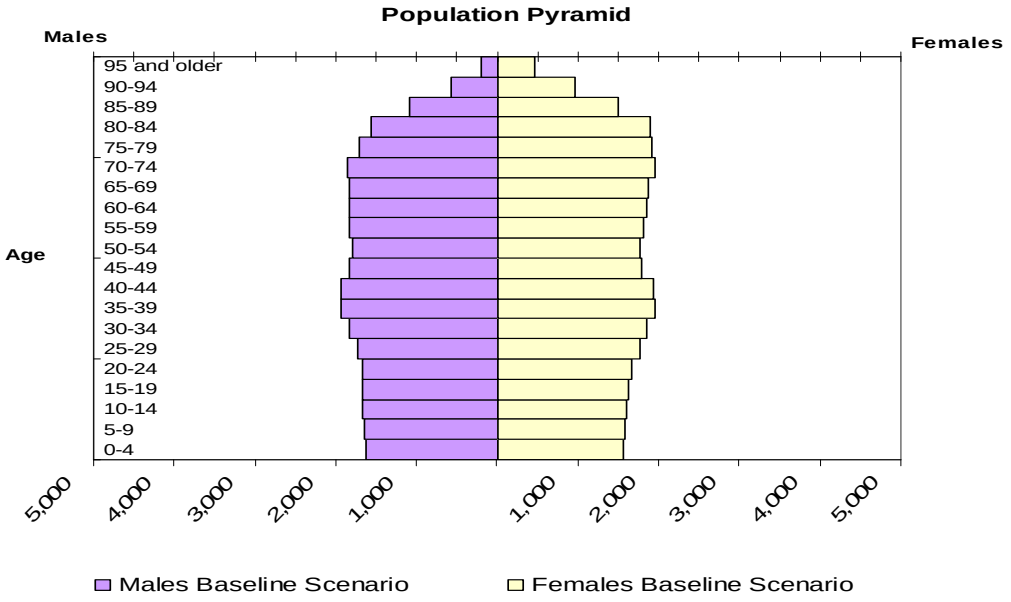
The underlying change in the structure of the population in the three scenarios can be seen by comparison of the sequence of *figures 7 to 10*, below.

Figure 7. Population Germany; pyramid 2005



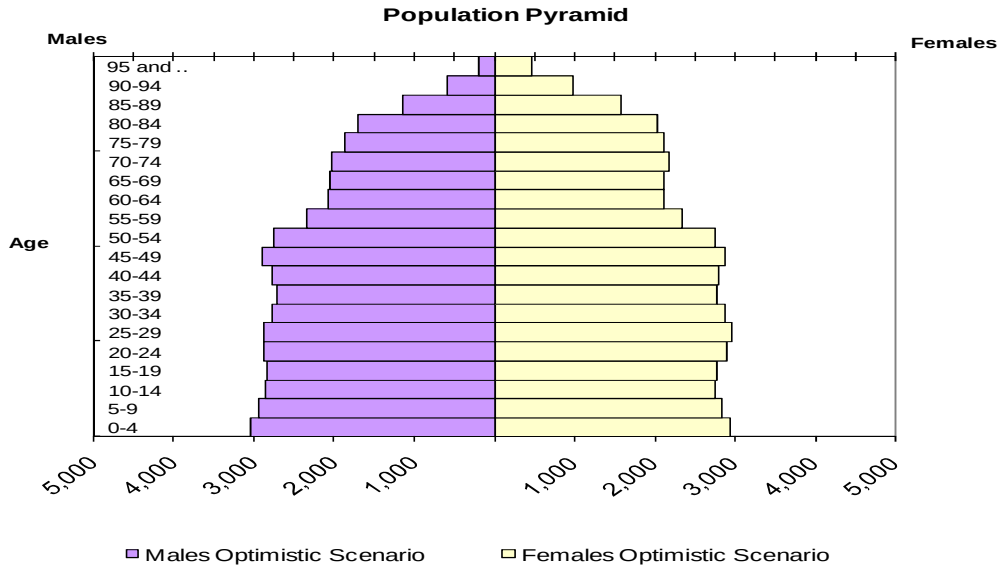
Source: Deutschlandmodell [*Result Sheets.xls, PopPyramid*].

Figure 8. Population Germany; pyramid 2070, *baseline scenario*



Source: Deutschlandmodell [*Result Sheets.xls, PopPyramid*].

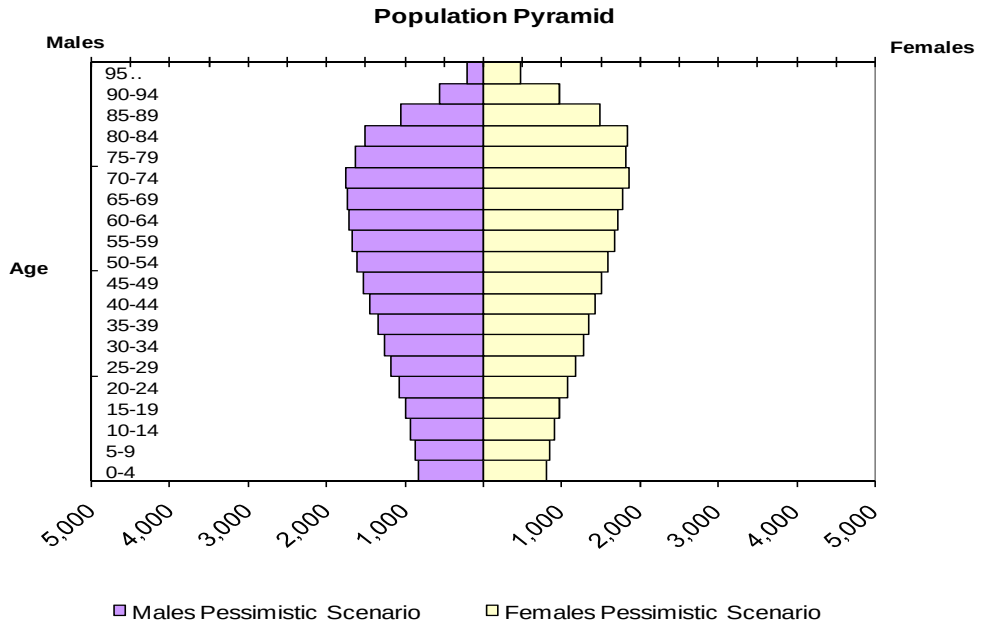
Figure 9. Population Germany; pyramid 2070, *optimistic scenario*



Sourc

e: Deutschlandmodell [*Result Sheets.xls, PopPyramid*].

Figure 10. Population Germany; pyramid 2070, *pessimistic scenario*

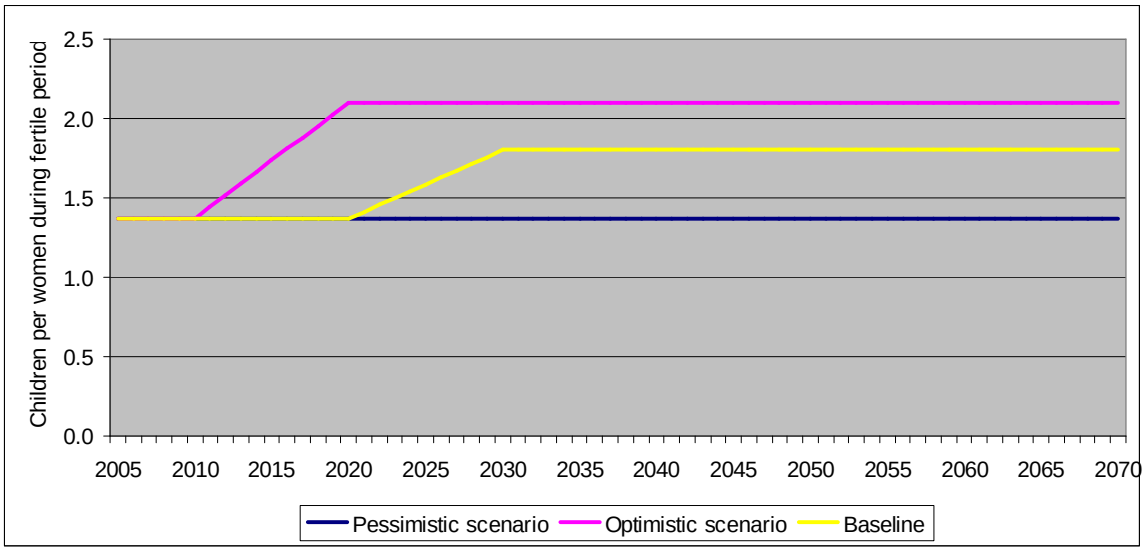


Source: Deutschlandmodell [*Result Sheets.xls, PopPyramid*]

Fertility

The baseline scenario assumes a constant fertility rate of 1.37 until 2020, followed by a linear annual increase until 2029 reaching a value of 1.8 in 2030, which is kept constant until 2070. The optimistic scenario assumes the same initial rate of 1.37 until 2010, then a linear increase to 2.03 in 2019, followed by a constant rate of 2.1 until 2070. A constant rate of 2.1 implies reproduction of the German population in the long run. In the pessimistic scenario the fertility rate of 1.37 is set unchanged until 2070.

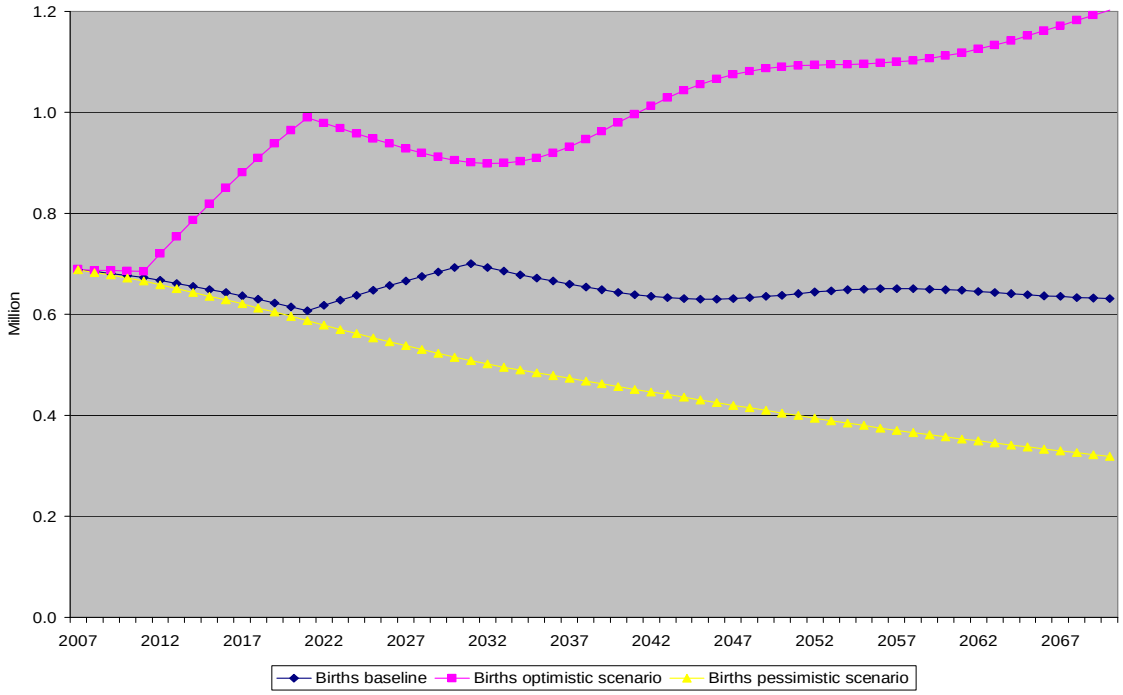
Figure 11. Population Germany; fertility rate, three scenarios



Source: Deutschlandmodell [*Blueprints.xls, Chart1*].

The resulting number of babies born is reflected in figure 12.

Figure 12. Population Germany: births, three scenarios



Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart2*].

The number of births is indicative for the future public resources needed for family benefits to be paid under the different demographic assumptions;[50] their impact on the financial situation of pension and health systems follows only with long time-lags (contributors, pensioners).

Mortality

The assumptions about mortality rates play a significant role in determining future pension and health expenses as they directly determine the number of a society's aged persons.

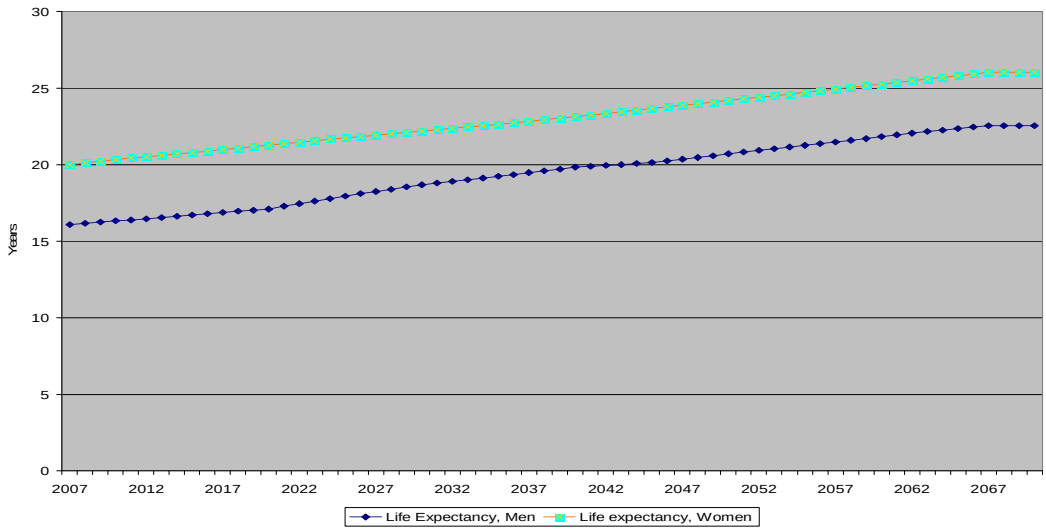
The mortality rates have been assumed indifferent with respect to the three scenarios. The reason is that there is no commonly accepted theory at hand that would allow for linking the rates with, for example, economic growth assumptions. Implicitly, thus, we argue that the assumed trend in increasing life expectancy (= reduction in mortality) is «autonomously» induced by factors alien to the analytical framework underlying this study. Assumed mortality reduction implies a long-term increase of male life expectancy at birth of almost nine years, of female life expectancy of almost 8 years – thus, there is a slight assumed convergence of male and female life expectancy (Table 3).

For the calculation and analysis of old-age incomes provided under the German social budget life expectancy at age of retirement is more indicative than life expectancy at birth. We have chosen life expectancy at age 65 as an indicator for the average time during which retirement income systems in Germany will pay, over the long-term future,

[50] The social budget, by methodology, only includes current cash- and in-kind payments, however excludes investments for example into infra-structure like kindergarten buildings or youth centers.

individual retirement benefits. On this basis, for both sexes a gain in life expectancy of 6 years was calculated for the end of the projection period (in comparison to present estimates); this is, for men a plus of 40 per cent, for women of 30 per cent.

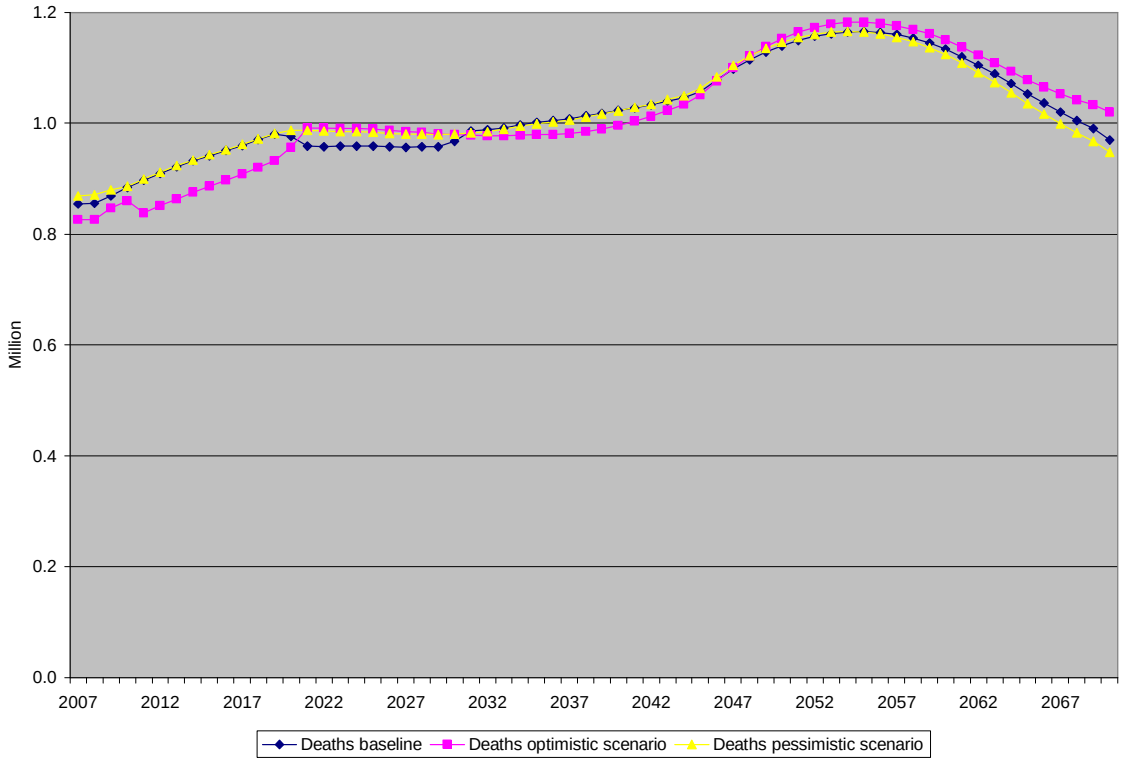
Figure 13. Population Germany: life expectancy at age 65, three scenarios



Source: Deutschlandmodell [*Blueprints 2.xls, Chart1*].

The number of deaths, in line with the mortality assumptions, develops as reflected in the following figure 14.

Figure 14. Population Germany; deaths, three scenarios



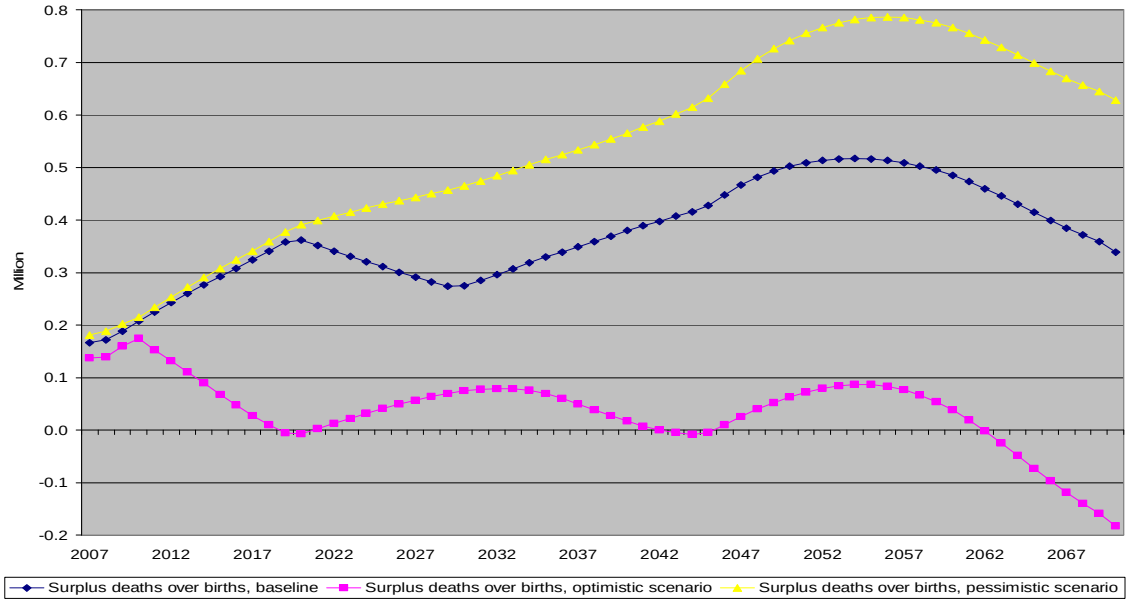
Source: Deutschlandmodell [Tabellenanhang Demography.xls, Chart1].

It appears paradox, at a first glance, that the number of deaths in the optimistic scenario, at the beginning of the projection period, is lower than in the other two scenarios; instead, one would expect a positive correlation (higher population = more deaths; given the identical mortality rates under the three scenarios). The explanation is that the ILO population model allocates the net-immigrants, entering Germany, over the single ages 0, 1, 2, …, 100 by assuming that immigration mainly takes place through persons in their active ages, who – simultaneously – bring a certain, constant quota of children; in the older ages, however, it is assumed that net-immigration is negative, i.e. persons aged around 60 and above leave the country. Accordingly, Germany's elder population (and, thus, the number of deaths) declines as a result of higher net-immigration. This technical reaction of the model is, of course, arguable but the resulting effect is small and does not affect the validity of the results, including related interpretation and impacts on the social budget. (Also see *net migration*, below.)

Figure 15 shows that over the full projection period the natural balance of population development (= births minus deaths) remains negative, i.e the number of deaths is in almost all years higher, in the baseline and the pessimistic scenario significantly, than the number of births. This observation is explained by two consequences of the model assumptions: first, net immigration under the baseline and the pessimistic scenarios are not sufficient to compensate for the high differential between mortality and fertility; second, the increases in fertility take a long time before the accumulated additional population numbers start having significant impacts on the total population: only, after the first generation of «additional» female babies has entered their reproductive age they will themselves have more babies at meanwhile higher fertility rates.

The balance is relatively low only in the optimistic scenario (but over most of the projection period still not zero or positive): first, fertility rates are assumed to reach reproduction level soon, i.e. the additional propensity towards children feeds relatively fast through the society (the population in their reproductive ages); second, the assumed net-immigration level is high enough to out-balance the still positive natural balance of population development, and thus increases the overall population.

Figure 15. Population Germany: excess of the number of deaths over the number of births, three scenarios



Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart3*].

Net migration

The above results depend on the migration assumptions: the model assumes that immigrants of period *t* assume already in t+1 the same reproductive behaviour as the resident population in t.

All scenarios assume positive net migration to Germany, i.e. it is assumed that Germany remains an «in-taking» country.

The baseline scenario assumes a slow increase in net migration to a level of 100,000 persons by 2010, leaving this level annually constant over the full projection period, i.e. until 2070.

The pessimistic scenario assumes an initial decrease until 2010 and a constant level of 50,000 persons after.

The optimistic scenario assumes a relatively strong increase in net migration until 2010, then leaving the level at 200,000 persons per year.

The migration assumptions, including the one under the «optimistic» scenario, are relatively conservative. In an earlier study, focused mainly on population development and migration policies, the *Immigration Commission* recommended that Germany should shape its demographic future also by allowing for a pro-active immigration policy, i.e. actively aiming at permanent settlement.[51] The calculations of the commission concluded that an initial net migration of 100,000 persons per year, a gradual increase to 150,000 in 2020, followed by a further increase to 300,000 persons would achieve the highest economic growth.[52] Our calculations, in principle, confirm those calculations (see economy, below).

Demographic dependency ratios

We define three demographic dependency ratios:

1. the ratio of the number of persons aged 65 and above over those aged 20 to 64, labelled «old-age dependency ratio»;

2. the ratio of those aged 19 and younger over those aged 20 to 64, labelled «youth dependency ratio», and

3. the ratio of the sum of the above ratios over those aged 20 to 64, labelled «total dependency ratio».

We do not consider these ratios, in a strict operational sense («technically»), indicators for concrete policy decisions.[53] However, they (or similar) ratios have been used nationally

[51] Unabhaengige Kommission Zuwanderung (2001), *Bericht der Unabhängigen Kommission 'Zuwanderung'*, Zuwanderung gestalten, Integration foerdern, July, 4th.

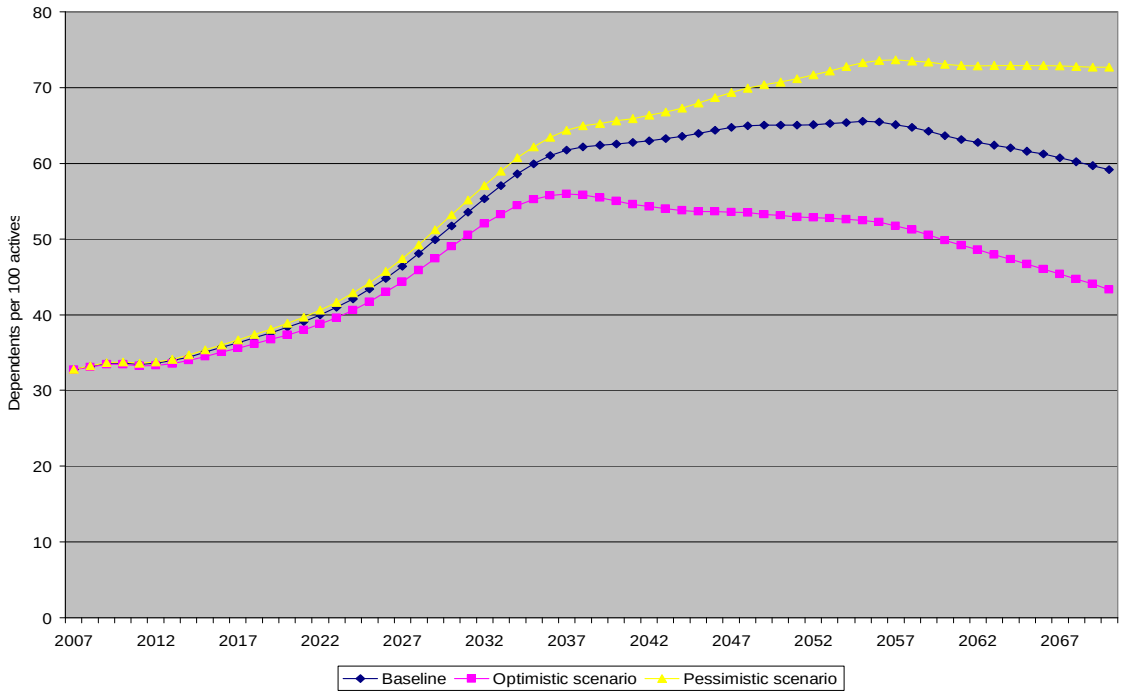
[52] Ibid. p. 72. The commission's report, furthermore, recommends targeted economic migration. Potential migrants would qualify using a points system with bonuses for their skills, qualifications and language ability.

[53] Better indicators, for policy decisions, are system-dependency ratios, calculated as scheme specific beneficiaries divided by scheme specific contributors.

and internationally in similar studies[54] as indicators demonstrating problems of financing social benefits that result from shifts in population structures.

The following three figures describe the shift in the population structure in terms of classical demographic dependency ratios. Figure 16 depicts the ratio of the number of the population aged 65 and above to the number of the population between 19 and 64 years old, i.e. the so called demographic old-age dependency ratio.

Figure 16. Old-age dependency ratio



Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart4*].

Figure 17 represents the ratio of the number of the population aged 19 and below to the number of the population in the active age group (19 to 64 years old), i.e. the so-called demographic youth dependency ratio.

[54] See most recently, for example, Cok, Mitja and Joze Sambt: *Long-Term Sustainability of the Slovenian Pension System*. Forthcoming.

Figure 17. Youth dependency ratio

Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart5*].

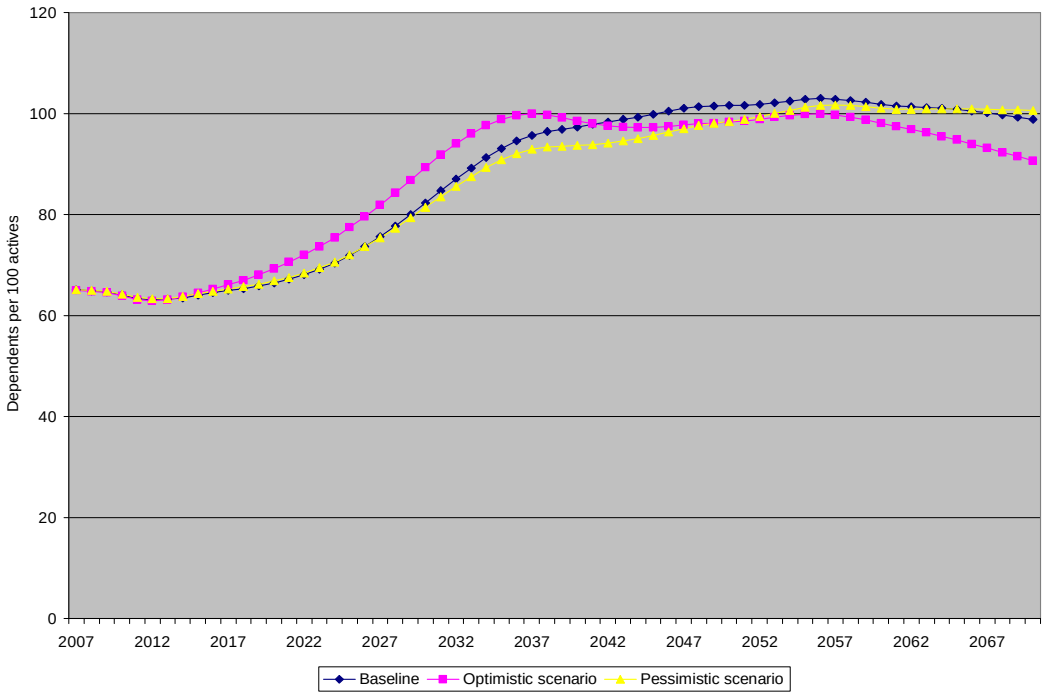
Figure 18 represents the total demographic dependency ratio, which is the sum of the previous two ratios.

In summarizing, the results broadly indicate that any structural problems of financing Germany's retirement income and health services systems, as far as they result from demographic developments, cannot be overcome, within the next 25 to 30 years, by pro-natal or active immigration policies: under all three scenarios, the old-age dependency ratios develop quite similarly until the early 2030s, then begin to deviate more significantly; the youth dependency ratios increase fast with assumed increased fertility rates and increased immigration. The total dependency ratio, however, is almost identical in all three scenarios. At the same time, the results indicate that demography-induced financial problems of Germany's social system increase with delaying further the political decisions required for the implementation for explicit pro-growth immigration policies.

The total dependency ratio shows that, in case Germany's social system would allocate the same level of benefits to persons aged 0 to 19 as it does to those aged 65 and over (which, for various reasons, is not the case)[55], then society's future relative financial burden would be, with respect to spending on these two groups, almost identical. Of course, as all scenarios differ with respect to economic developments, carrying the burden would be easiest under the optimistic scenario (see table 1, above; see chapter 2.3: Three economic scenarios).

[55] It must be taken into account that the social budget, by methodology, subsumes, under the family function, current spending on kindergartens, on youth aid, on spouses («tax splitting»), and on child benefits, whereas it does *not* include all public spending on education (schools, universities).

Figure 18. Total dependency ratio, three scenarios



Source: Deutschlandmodell [*Tabellenanhang Demography.xls, Chart6*].

2.2 Three labour supply scenarios

In modelling terms, the outer boundary for labour supply is determined by the number of persons, that can potentially be assumed undertaking economic activities (activities of income generation). International practice sets these limits at the ages 15 (lower limit) and 69 (upper limit), respectively. In Germany, practice of statistical *publication* differs to some extent, fixing these ages at 15 and 64; this is based on the fact that in Germany labour market participation above 64 is (still) only marginal.

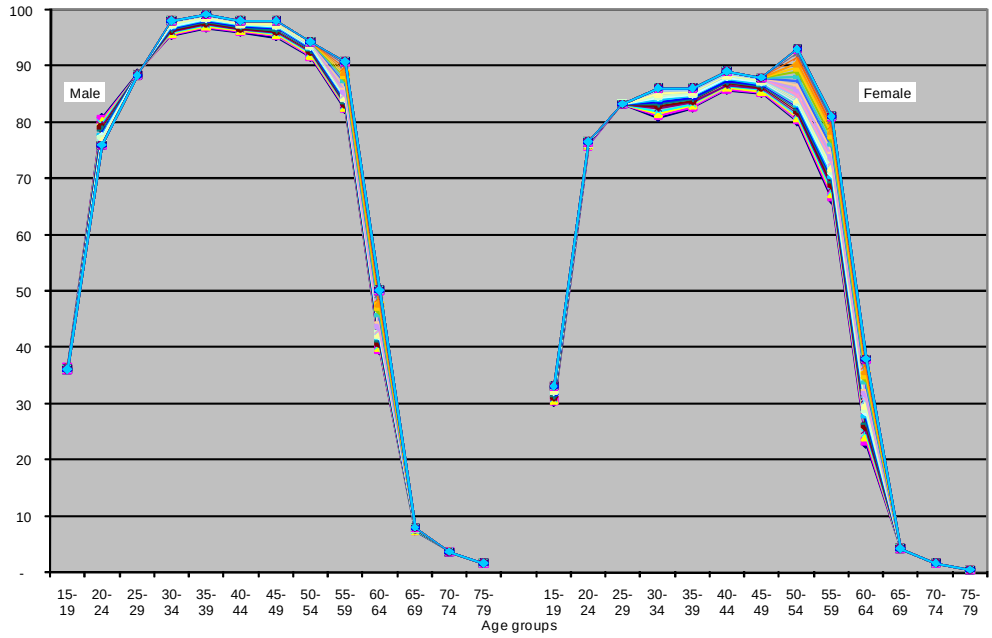
The total labour force (labour supply) comprises all persons actually active on the labour market (= employed or unemployed)[56]; statistical information is available for five-year age-groups between 15 and 79. Out of this information, labour market participation rates, by single age groups, can be calculated. Labour market participation rates are, for each age group, equal to the total number of persons offering labour over the total potentially active persons in that same age group, expressed as a percentage. The following labour market participation rates were assumed (Figure 19).

Figure 19 reflects, for men and women separately, the sequence of labour market participation rates assumed for the years 2007 to 2070. As can be seen, a slight increase in participation rates was assumed in all age groups; it was considered reasonable to assume some additional increase in the age groups 50 to 64 where especially women might wish to participate more in future.

[56] The labor force concept is based on the definition of the ILO, which is accepted and applied in almost all countries.

Anyway, as German participation rates are in most age groups already high,[57] room for expansion, on the basis of a pure headcount, is limited. More significant expansion of labour supply can, thus, only be organised by an expansion of working time. (See chapter 2.3)

Figure 19. Labour market participation rates by age group (male, female), 2007 to 2070



Source: Deutschlandmodell [*Blueprints 2.xls, Chart2*].

In recent decades, labour force participation rates for women increased, whereas the rates of elder male workers fell.[58] At the same time, prolonged unemployment has discouraged labour market participation. It is expected that recent labour market reforms reverse these trends.

Multiplication of the population (by age groups) by the labour market participation rates (by age groups) renders total labour supply. In formal terms:

$$TLF\ t = \sum_{x,s} (POP\ t,x,s * LFPR\ t,x,s)$$

where

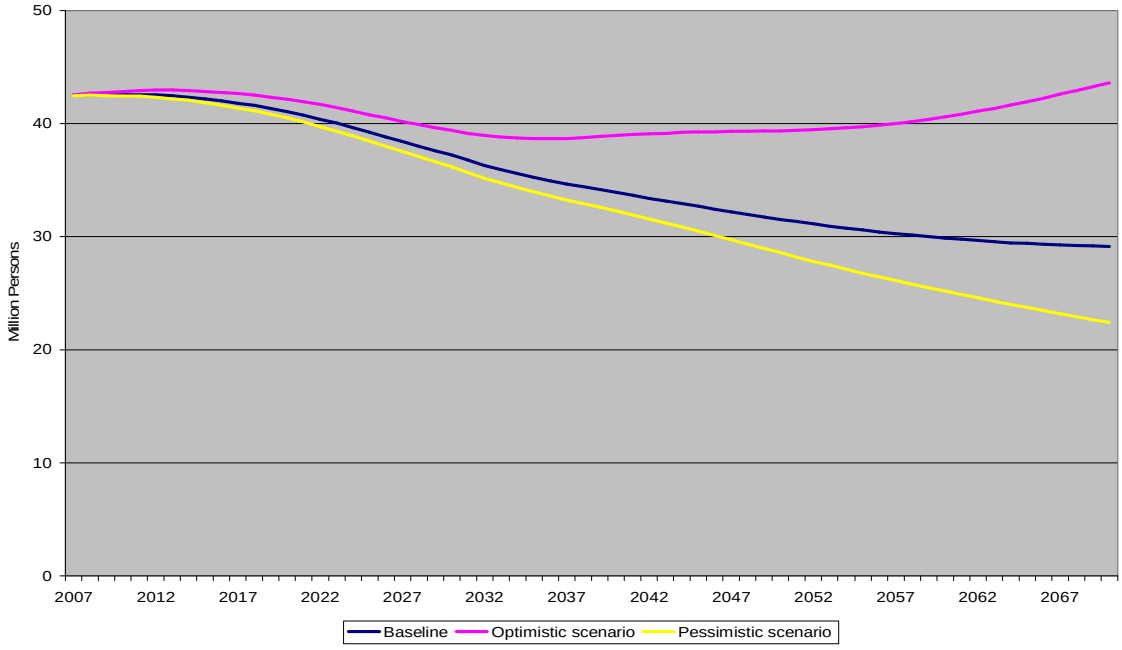
TLF =: Total labour force in year *t, and*

LFPR *t,x,s* =: Labour force participation rates by sex *s* and age *x* in year *t*

[57] In the age group 15 to 19 participation might even be considered too high.

[58] International Labour Office: *Key Indicators of the Labour Market* (2003-2004). Geneva, 2003.

Figure 20. Total labour force development – three scenari

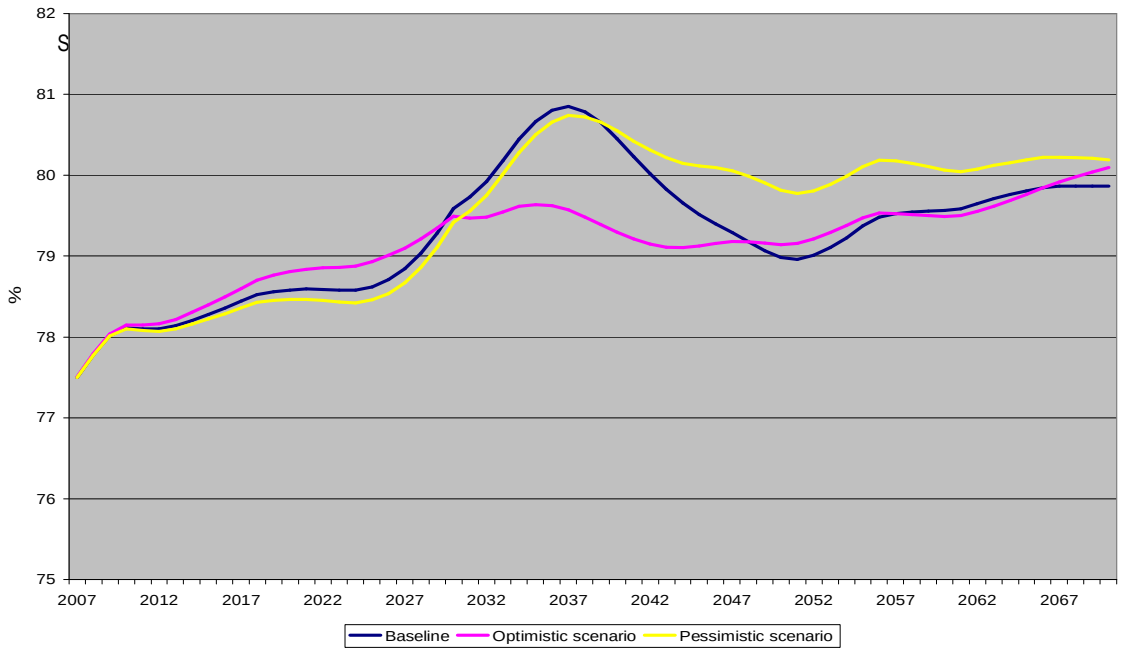


Source: Deutschlandmodell [*Tabellenanhang Labour Force.xls, Chart2*].

While only in the optimistic scenario the number of persons in the labour force broadly remains at present levels, it declines, in the baseline, by about 13.5 million persons (to 29 million in 2070); and by about 20 million persons in the pessimistic scenario (to only 22.5 million in 2070).

As a result of the above calculations the overall labour market participation develops as follows (Figure 21).

Figure 21. Labour market participation rate – three scenarios



Source: Deutschlandmodell [Tabellenanhang Labour Force.xls, Chart1]

It is obvious that these different population and labour force scenarios must have greatly diverting impacts on the range of Germany's possible overall economic developments, which, in turn, will determine the number of persons actually employed and, especially, those contributing to the social protection system, and acquiring rights (entitlements). The labour market balance, which takes account of both, labour supply and labour demand, is being described and explained in the following chapter 2.3.

2.3 Three economic scenarios

The economic model that was employed for the purposes of this study is a definition equation model – the definitions obeying the rules of the UN System of National Accounts; definition equation models are usually used in case of very long-term (demography-lead) projections; the model employed serves the only purpose to produce three mutually consistent sets of nominal macro-economic outputs that feed into the social sub-models, which represent the financial development of Germany's social budget.

The economic model focuses on a set of core variables, among these the

- labour force (see previous chapter) with an exogenously set unemployment rate;
- annual working time, and labour productivity per hour worked;
- prices are being represented by the GDP deflator, which is exogenously set at low inflation levels (below 2 per cent p.a.) and kept invariant with respect to the different real growth paths under the three scenarios.

Alternatively, all calculations could have been undertaken without any price assumption (i.e. in real terms only) – the reason for the explicit inflation rate assumption made (GDP-deflator) is owed to standard practice, which presents re-distributive flows of funds (social benefits) at macro-level only in nominal terms.

Nominal GDP (GDP in current prices) is, thus, the product of:

- the employed labour force,
- the working time per employed,
- the productivity per hour worked, and
- the GDP deflator.

The three economic scenarios differ mainly in their labour force development (as described in the previous chapter), in the working time development per employed, in the output per hour worked (labour productivity), and in the assumed unemployment rate.

Working time

Setting working time developments in an acceptable manner over a future period of almost 65 years is at least as challenging as setting productivity rates. The trends as reflected in table 2 (above) were agreed upon with the steering committee that accompanied this study. We applied those, in a first preliminary modelling round until 2070, as agreed. However, we did not consider the resulting rates for economic growth, under the hourly productivity assumptions made, reasonable in the longer run; in other words, we introduced to the model, exogenously, a counter-reaction of the labour markets to negative GDP growth rates and, thus, a reversal of the present average working time trends. More precisely, we

assumed in all scenarios, first, a trend decline of average annual working time of the employed (= self-employed and employees) until 2030, followed by a turn around (average working time *increase*) thereafter; as a result, average annual working time is assumed to have «bounced back» in 2070 to the levels that had been realized by the beginning of the 2000s. The trend-decline until 2030 can be justified by the inertia of present societal and technological trends but, also, by the assumed increase in fertility rates, which might trigger further openness to sharing of family responsibilities, which results in a further decline in the measured volume of the overall working time volume. Following the general logic of the set scenarios working time grows fastest, at the far end, in the optimistic scenario, while growing slowest in the pessimistic scenario. (Also see table annex.)

Labour productivity

Assumed model input is the growth rate of labour productivity per hour worked. It was set, over the full projection period:

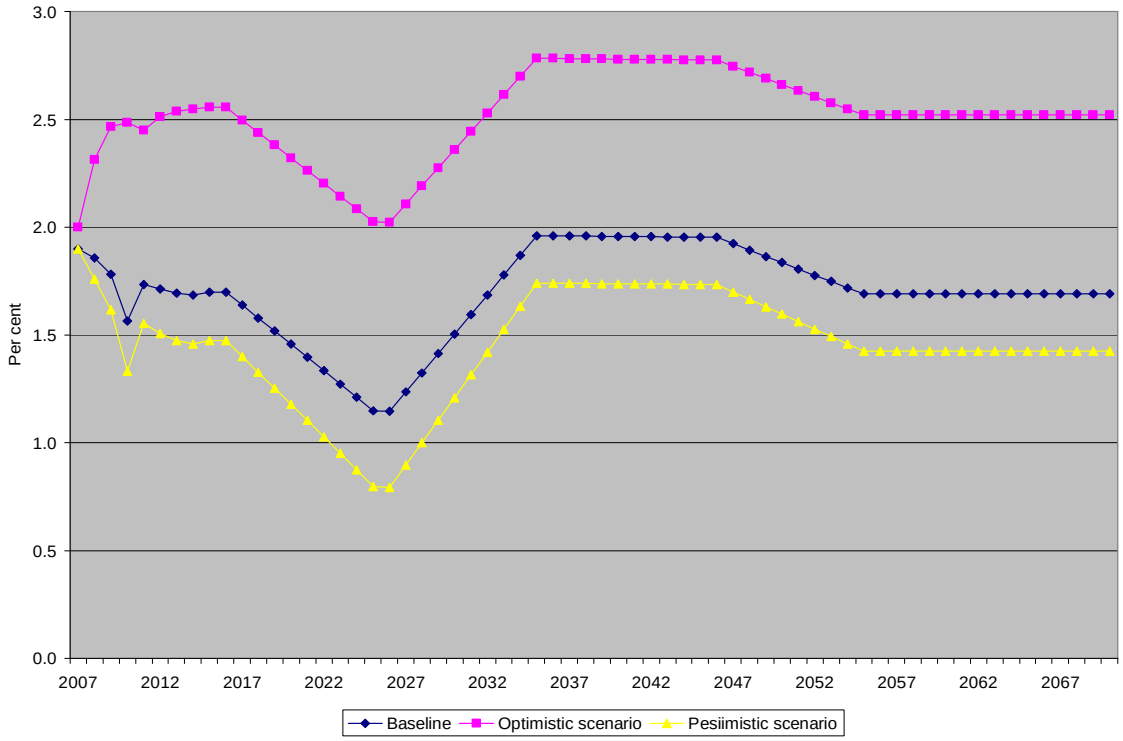
- 1.7 per cent p.a. in the baseline,
- 1.5 per cent p.a. in the pessimistic scenario, and
- 2.5 per cent p.a. in the optimistic scenario.

The rates in the baseline and in the pessimistic scenario can be interpreted as prolongation of past observed trends. By contrast, the optimistic productivity assumption can be considered reflecting a «full modernization» scenario, which we consider possible (under all demographic scenarios), but only if the necessary sustained steps are being consistently taken. In this context, international experience indicates that the role of the state in creating economic success may have to be re-considered. [59]

Output per employed is a result of the assumptions on working time development, on productivity per hour, and on unemployment (see below). Figure 22 shows the resulting growth rates under the three different scenarios.

[59] See, for example, Heilmann, Sebastian: *Die Volksrepublik China als lernendes autoritäres System. Experimentierende Staatstätigkeit und wirtschaftliche Modernisierung*. In: NZZ Online, 28 Juni 2008.

Figure 22. Output per employed – three scenarios*)



*) Original values smoothed (MA[9])

Source: Deutschlandmodell [*Tabellenanhang Economy Part 1 new.xls, Chart2*].

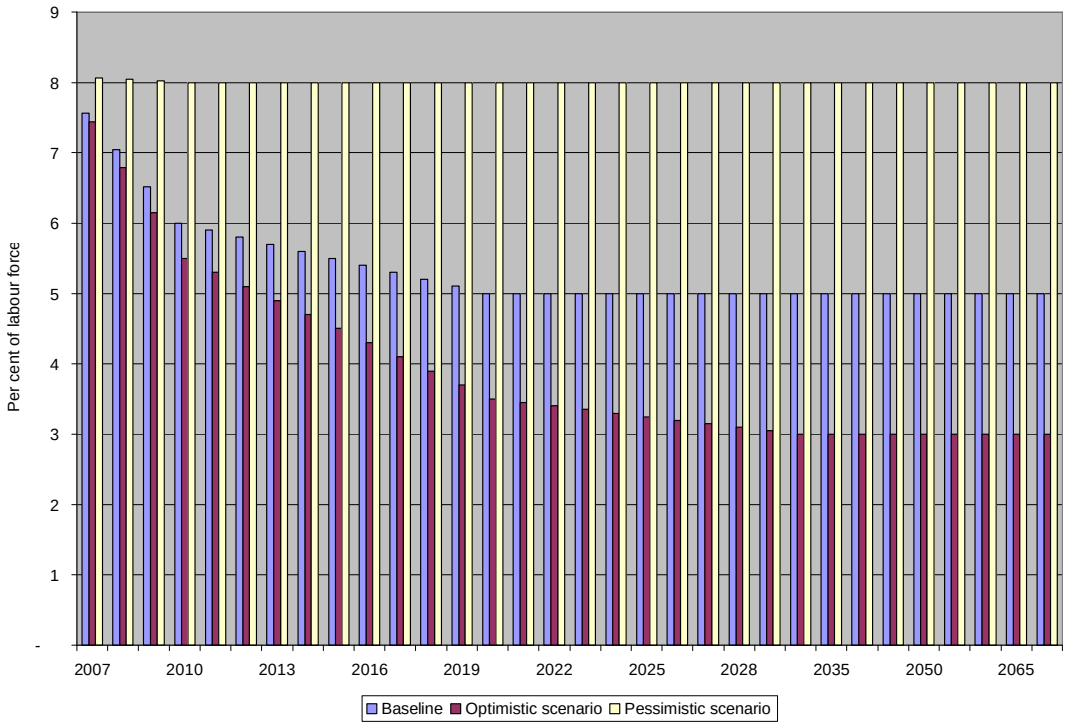
At constant hourly productivity growth rates the values in figure 22 mainly reflect the assumed working time trends.

Unemployment and contributors to social security

The model functions on the basis of assumed unemployment rates that differ by scenario: under the baseline we assume the rate converging towards 5 per cent, under the optimistic scenario to 3 per cent, while it remains at 8 per cent in the pessimistic scenario. The unemployment rate is defined according to the internationally accepted (and applied) definition of the ILO, i.e. as a percentage of the labour force.

Figure 23, below, provides a graphical presentation of the assumed rates.

Figure 23. Unemployment rate – three scenarios

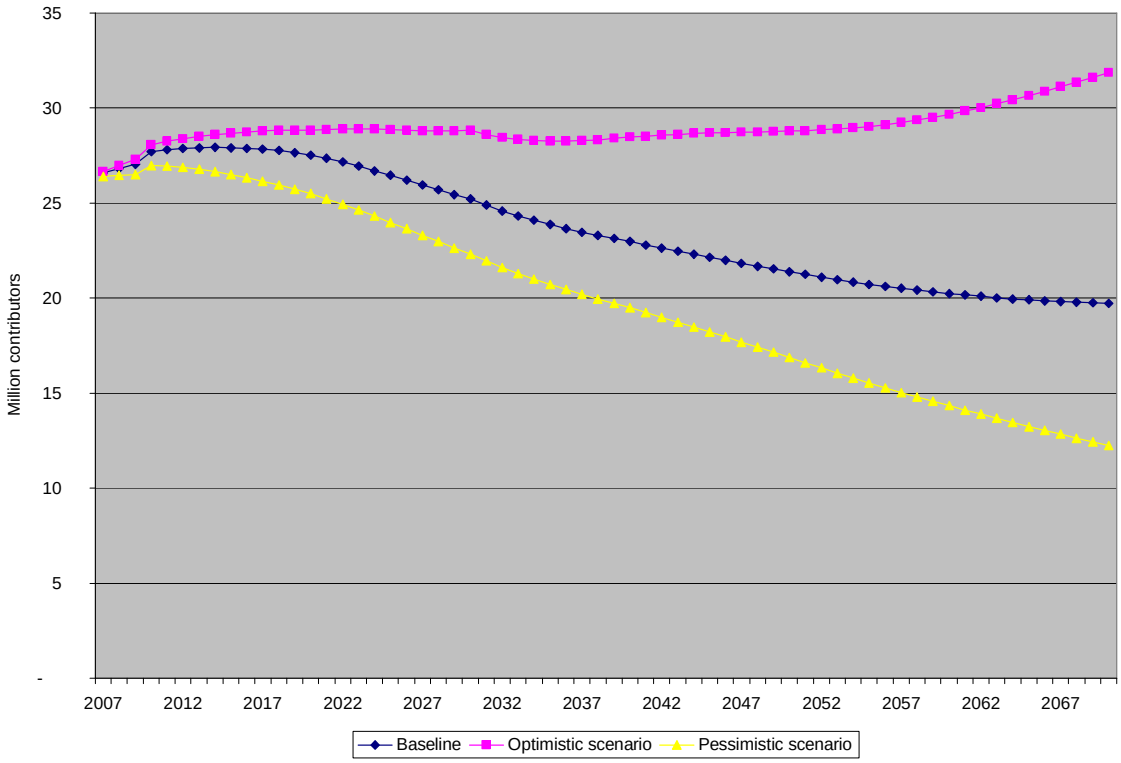


Source: Deutschlandmodell [*Tabellenanhang Labour Force.xls, Chart3*].

Multiplying the labour force, which was calculated in the labour supply model, by the employment rate (= 100 minus unemployment rate) renders total employment, i.e. the demand side of the labour market balance. Total employment is allocated to the self-employed, civil servants, contributors to the social security system (among which we specify the contributors to the social health insurance), and to other employees (marginal employment and others). The number of contributors who pay contributions out of earned primary income is of major interest for the social budget calculations; it is calculated as a residual, after fixing exogenously the number of self-employed (differing slightly by scenario), civil servants (assuming a constant relation of the number of civil servants to the total population), and of «other» employees (differing by scenario). We abstain here from describing in detail the technical assumptions made. Details can be found in tables 2g to 2f, in the annex.

The number of contributors develops as shown in the following figure 24; the number of contributors to the social health insurance hovers around slightly above 90 per cent of the total number of contributors.

Figure 24. Number of contributors to social security – three scenarios



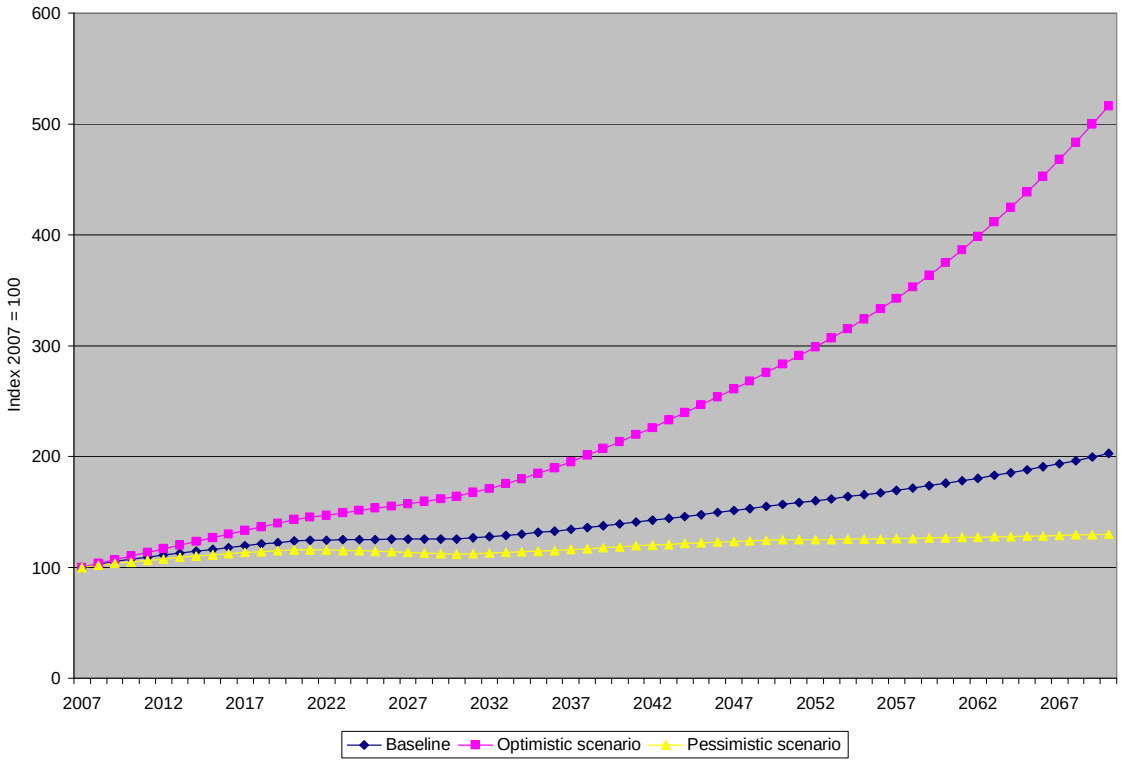
Source: Deutschlandmodell [*Tabellenanhang Labour Force.xls, Chart4*].

It should be mentioned that in all scenarios the number of contributors could be at least by around three million higher, in the pessimistic scenario by at least 4.5 million, if, at given unemployment rates, labour markets would allow to transform the number of «other» employees into contributors. Whether this actually happens depends on the structure of future economic growth and the correlated future development of the structure of the labour markets, and on labour market legislation. We refrained from setting the labour market assumptions to such extremes in order to maintain a prudent position within the respective scenarios. However, additional contributors would, *ceteris paribus* (*and under status-quo legislation*), have a decreasing impact on the contribution rates of social health and unemployment insurance (see below, results for the social budget); the impact on the contribution rate of the social pension insurance would be limited as additional contributors by the beginning of the projection period would imply additional pensions by its end.

Results for macroeconomic aggregates

Real GDP develops significantly different under the three scenarios: under the baseline it doubles by the end of the projection period (2070) in comparison with the first projected value (2007); in the pessimistic scenario, it continues to grow slowly, reaching a level of 30 per cent above 2007; in the optimistic scenario GDP develops exceptionally faster and reaches a level 5 times as high as the one of 2007 (Figure 24, below). Nominal GDP values differ between scenarios only with respect to the development of the GDP deflator.

Figure 25. Real GDP, 2007 = 100 – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Economy Part 1 new.xls, Chart1*].

The other important aggregate influencing the social budget and, thus, the results of this study is labour income. Labour income [60] is of special interest in social systems, like the German, where the larger parts of social expenditure are being financed through employer and employee contributions. Both are accounted for in labour income; accordingly, at given contribution rates, there are more financial resources available for financing social expenditure the higher the labour income share in GDP, and vice versa. Also, a given social budget can be financed at lower contribution rates the higher the labour income share in GDP, and vice versa. [61]

With meanwhile less than 50 per cent, Germany's labour income share in GDP has since a few years joined the ranks of most other countries in the Euro area, which, other than Germany, have kept their respective labour income shares stable (figure 56). The calculated future level-development (hovering between 47 and 51 per cent of GDP (figure 26)) is a result of the assumptions that future nominal hourly wage increases parallel nominal hourly labour productivity increases and that annual gross wages strictly correlate with working time; in combination, this implies significant changes in wage settlements among and between trade unions and employer organisations as well as between non-organized labour and non-organized employers. We consider the assumption justified as it is not realistic to assume that Germany's labour income share falls behind European

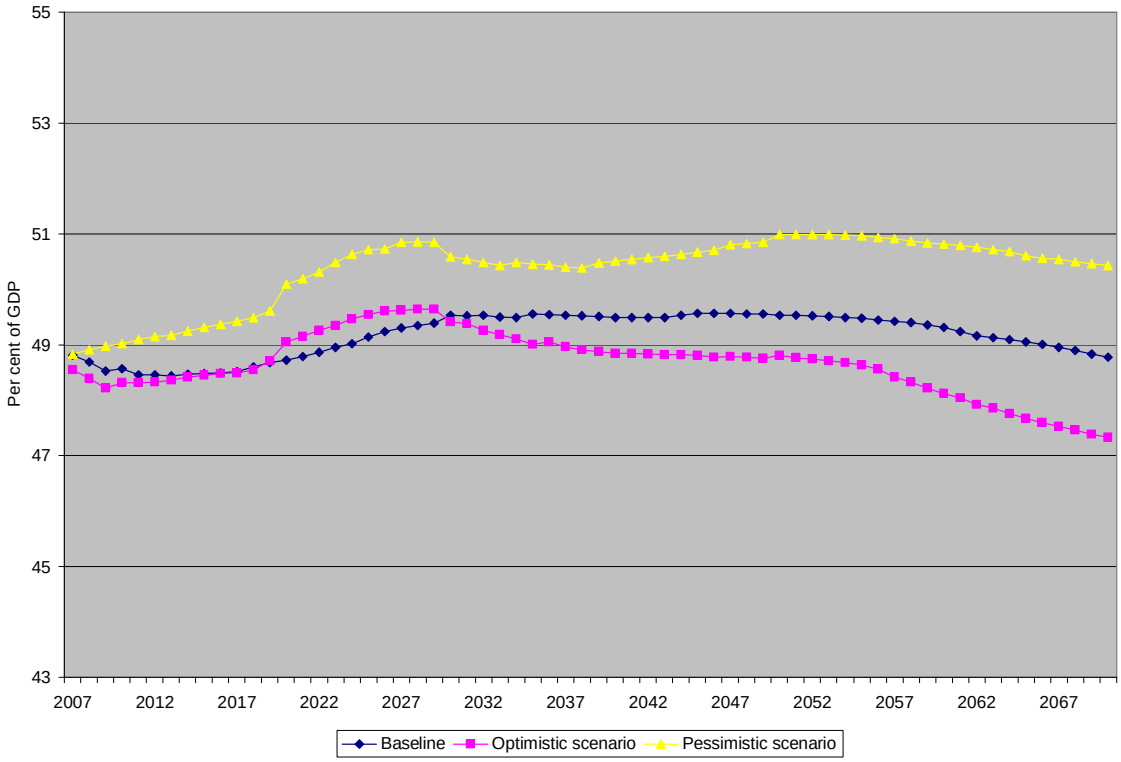
[60] Compensation of employees.

[61] Though arithmetically correct, the policy implications and practical validity of this consideration depends, inter alia, on whether a higher labor income share is the result of higher average wages at given employment levels or of higher employment levels at given average wages.

average. [62] Technically, the future development of the labour income share is influenced by the different future contribution rate developments under the three scenarios; however, our calculations show that these rates will have only limited impacts on employer contributions.

More macro-economic implications of the social budget calculation results are described in chapter 5 after a detailed description of the social budget projection results.

Figure 26. Labour income share in GDP – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Economy Part 1 new.xls, Chart3*].

2.4 Assumptions specific to the social budget

In the previous sections we explained the demographic, labour market and economic assumptions underlying the three scenarios. All variables are either direct input to Germany's social protection system (as legislated), they serve as reference for such direct input-variables or they serve analytical purposes. For example assumed labour productivity serves the twofold purpose of generating GDP and per capita wages; the latter, in turn serve as input to indexation of benefits, as stipulated by law; nominal GDP serves as reference for analysis of the social budget's revenue and expenditure under a macro-economic perspective. The GDP deflator represents overall price development and serves as indexation reference where social legislation requires price-related indexation.

In this chapter, we address some of the specific assumptions required for the calculations *within* the various functions of the social budget (or within an institutional context), i.e. assumptions that come «on top» of the assumptions explained thus far.

[62] European average calculated as indicated in figure 56.

Function health

The expenditure on function health consists of different categories, among which the most important are:

- health expenses of the social Health insurance (SHI);
- health expenses of the long-term care insurance (LTCI);
- health expenses under the civil servants' medical benefits scheme (CSMBS);
- continued payment of wages and salaries in case of sickness (CPW),
- health spending under other public schemes.

Expenses and revenue for SHI, LTCI, CSMBS and CPW were calculated on an institutional basis, health spending of all other schemes was calculated residually.

In line with international practice expenses of the SHI were calculated by splitting members into in- and outpatients. Male and female utilization rates, for in- and outpatients, were estimated and applied to the results of the population model. With respect to the future development of utilization rates under a regime of growing life expectancy we employed a «middle» assumption in form of the *dynamic equilibrium* («*healthy aging*») *hypothesis*, which posits, that the absolute number of life-years lived in bad health remains constant in the wake of increased longevity. This hypothesis was complemented by a *death-cost* modelling approach, which makes use of the observation that a very high share of the available health care resources spent on an average person during his/her life-time is concentrated on the final life years, thus suggesting to separate the observed high health care costs of older people into a demographic component (where mortality rates are calculated net of those cases close to death) and a «closeness to death» component. In a *death costs scenario*, thus, the whole population (by sex and single ages) is split into two further vectors: survivors and decedents. As a result, the financial impact of the ageing of a population is less profound than in a «standard» projection design.

Further specifications, e.g. with respect to the age-related price pattern of pharmaceuticals, were made. (For more details see section 3.2.1; annex 2 provides a wider description of the health model.)

Revenue for SHI was calculated on the basis of present legislation; special care was taken of the revised opting-out versus opting-back options introduced recently. It was assumed, however, that the federal transfer to SHI, planned to increase over the coming years (until 2016) continues to increase further over the full projection period in parallel to GDP.

While using LTCI specific data information, the calculations for the LTCI were based on a similar methodological approach. (Annex 2.)

The spending dynamics for the CSMBS is based on the per-capita spending development of the SHI, multiplied by the number of active and retired civil servants as projected under the model for the old-age pensions of civil servants. This is justified, as legislation on the SHI can usually be assumed to be applied consistently – in its dynamic elements – to the CSMBS scheme. (Annex 2.)

Spending under CPW depends on the annual number of sickness cases («Krankenstand») in relation to overall dependent employment. This relation was assumed constant for the projection period; accordingly CPW varies with the sum of wages under the three scenarios. (Annex 2.)

All other expenses under the function health were calculated as a constant relation to the above single scheme spending. (Chapter 3.2.)

Function old-age and survivors

The function old-age and survivors comprises all social spending going to persons who either have retired for good, or who are survivors (widows, widowers, orphans). While this function comprises the expenses of a range of institutions (including, e.g., spending of the pension schemes of the liberal professions, and the farmers pension scheme) we focused modelling efforts on the statutory pension insurance (SPI; «Gesetzliche Rentenversicherung») and on the civil servants pension scheme («Beamtenversorgung»). Both schemes were calculated on the basis of present statutory regulations. With respect to the SPI it was assumed that the contribution rate will in no scenario exceed 22 per cent of contributory wages. The impacts of this assumption on pension adjustment and on the federal subsidy were taken into account. (Annexes 3 and 4; chapter 3.3.)

It is important to note that the recently implemented voluntary retirement savings scheme («Riester»), although subsidized by public transfers, was not incorporated in our calculations. For the time being, under the regulation almost no payments are as yet being made, and analyzing existing contracts in order to estimate future annuities would have gone beyond the scope of the project.

All other expenditure under the old-age function was calculated as a constant relation to the above two schemes. As in Germany coverage for retirement incomes is practically 100 per cent the error made by this approach is considered relatively small as all systems are exposed to the same overall population ageing process; spendings to retired old persons under social assistance are included in this function.

Function employment

The function employment basically consists of the expenses of the federal employment agency (ALG1 and other expenditure) and spending on so-called ALG2.[63] Over the short term, we assume development broadly in line with the government's mid-term financial planning (as of 2007); in the long run we assume that most spending correlates with unemployment and per-capita wages, while ALG2 is being indexed with prices. (Chapter 3.4.)

Function family

The expenses under the function family mainly comprise child benefits (which, in Germany, are delivered in the form of (indirect) tax benefits (= foregone income tax)), expenses on kindergartens, expenses on youth aid, and a special tax reduction for married couples («splitting»).

As there is no legislated indexation rules for child benefits (the tax brackets) an assumption on future such indexations had to be taken; for this purpose we assumed that the population aged 19 years and younger can, in the long run, be taken as a representative for the total

[63] After the labour market reforms of the beginning of the 2000s, unemployment aid that had been paid, under certain conditions, after expiration of unemployment benefit, was replaced by «unemployment benefit 2» («ALG2»), which is based on a minimum household income (social assistance) concept, accompanied by active employment placement through the employment agency.

volume of child benefit cases. Further, it was assumed, that per capita payments (per capita amounts of tax reduction) grow with per capita gross wages. If, alternatively, one would assume child benefit indexation (per capita) related to price developments then the expenses would significantly decline over the long projection period, which does not appear probable.

Similar argumentation holds for kindergartens and youth aid, where we again used the population aged 19 and younger as indicator for the number of places to be provided, and per capita wages as the cost-driver per place.

A similar approach was used for the «splitting» of married couples' income tax.

Other functions

The remaining functions have been projected on the basis of appropriate (ad-hoc) assumptions. (Chapter 3.6.)

3. Germany's social budget: scenario results

This chapter presents the calculations for expenditure and revenue of Germany's social budget, resulting from the framework assumptions explained above. We start with a summarizing overview, in sub-chapter 3.1, below, and continue in the subsequent sub-chapters with detailed descriptions of developments in the more important schemes of the social budget.

3.1 Total social budget: expenditure

(Table annex: Tables 4a to 4c)

Expenditure of Germany's social budget [64] comprised in 2006 a total of round about 700.2 billion € or about 8500 € per inhabitant. [65] This was equivalent to a *social expenditure ratio* of 30.3 per cent. [66]

Financing the social budget absorbed resources (revenue) in the order of 730.3 billion € or 8865 € per inhabitant or about 31.5 per cent of GDP. Revenue minus expenditure rendered a surplus of 30 billion € or slightly above 1 per cent of GDP.

In historical comparison, the social expenditure ratio is currently relatively high; [67] at the same time, in 2006, it is already in a phase of cyclical decline, which is partially due to the growth of nominal GDP. The dynamics of the decline have been incorporated in our long-term calculations (1) through the assumed further reduction of the unemployment rates, especially in the baseline and the optimistic scenario, and (2) through a simultaneous increase of employment, especially of the number of contributors, limited only by labour supply.

Social budget expenditure

Over the longer run the future development of the social expenditure ratio is being determined, in essence, by population development and the impacts of the structural changes in social legislation that had been taken during the first years of the present decade.

A long-term overview on aggregate results is provided by figure 27.

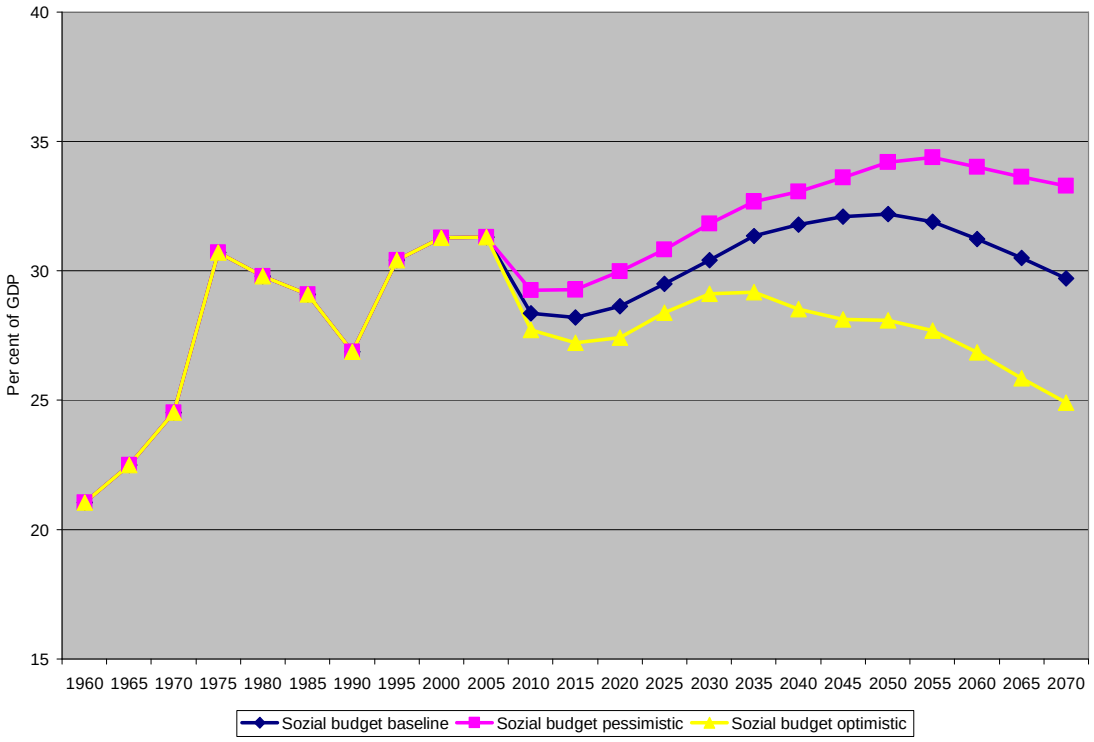
[64] Methodological explanations can be found in the glossary by the end of this report.

[65] Bundesministerium für Arbeit und Soziales (Hrsg.): Sozialbudget 2006 Tabellenauszug. Eigenverlag. Mai 2007. [Federal Ministry of Labor and Socail Affairs (ed.): Social budget 2006. Table excerpt. May 2007.] http://www.bmas.bund.de (download)

[66] Social budget expenditure in per cent of GDP in current prices.

[67] Among others, reasons for this observation are echo-effects of Germany's unification in combination with the economic problems during the years at the beginning of the present decennium.

Figure 27. Social expenditure ratio 1960 to 2070 – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b-p-o(2)*].

In summarizing, the results show that the social expenditure ratio:

- *in the baseline*, follows a long-term trend stabilising slightly above historically observed maximum levels. This scenario is characterized by mid-level labour productivity, low net migration of 100,000 persons annually, and birth rates converging towards 1800 children per 1000 women; [68]

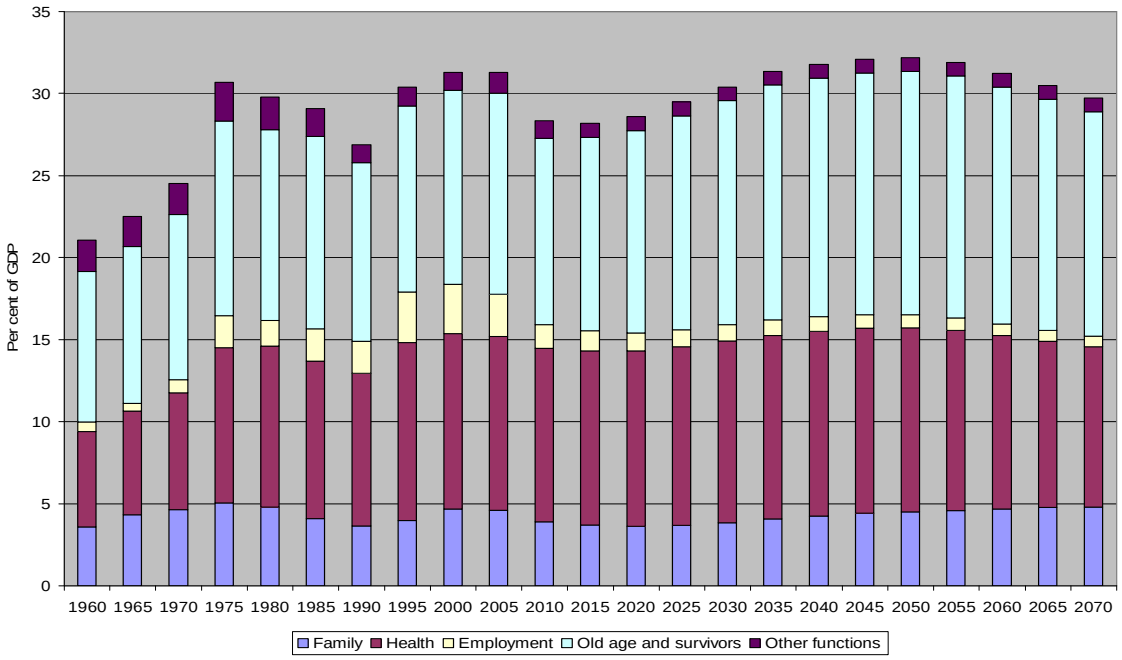
- *in the pessimistic scenario*, balances out at 2 to 3 percentage points above the levels of the baseline. This scenario is characterized by lower labour productivity, historically low (net) immigration (50,000 persons p.a.) and stabilization of fertility rates at present levels; and

- only *in the optimistic scenario*, while differing significantly from the other two scenarios, falls below historical levels. This variant holds comparatively high labour productivity, annual (net) immigration of 200,000 persons, and convergence of the fertility rate towards reproduction (around 2100 children per 1000 women).

The sequence of figures 28a to 28c shows the same aggregate developments desegrate by functional expenditure categories:

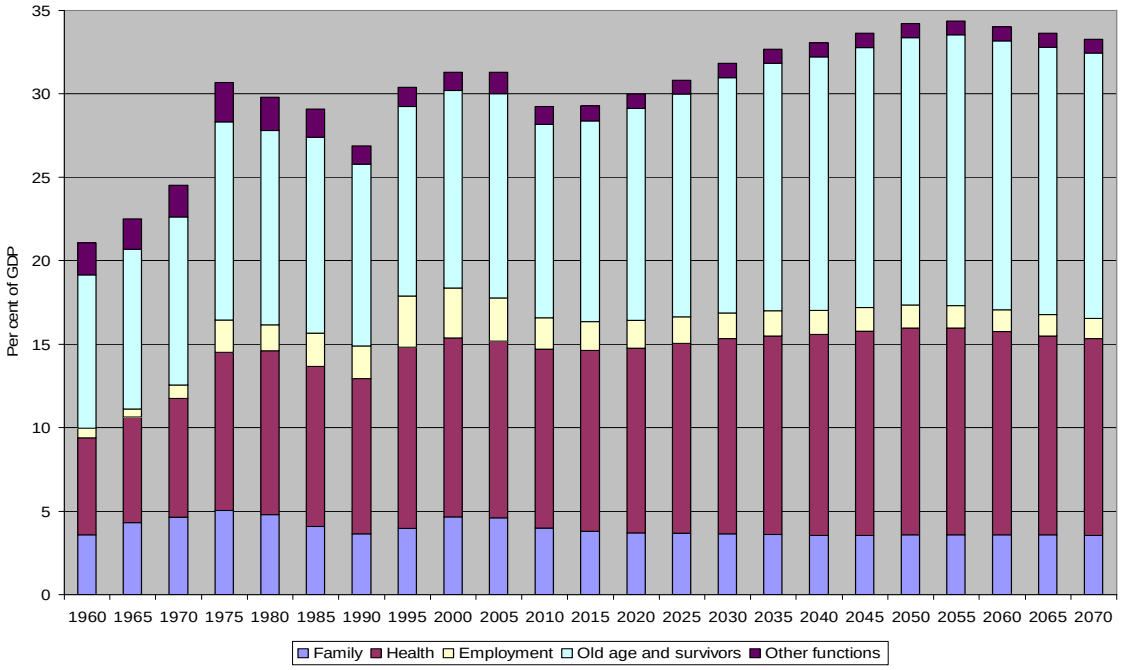
[68] The ILO population model incorporates the migration assumptions in all scenarios such that mainly persons in active ages migrate, which bring a certain number of children, while elder migrants (net) leave the country. Fertility assumptions relate to women aged between 15 and 49. Further explanations can be found in International Labour Office: *The ILO Population Projection Model (ILO-POP)*. A Technical Guide (Version 1.1. 8/2002). The International Financial and Actuarial Servic (ILO-FACTS), Financial, Actuarial and Statistical Services Branch, Social Protection Sector, International labor Office, Genva, 2002.

Figure 28a. Social expenditure ratio by functional categories 1960 to 2070 – baseline



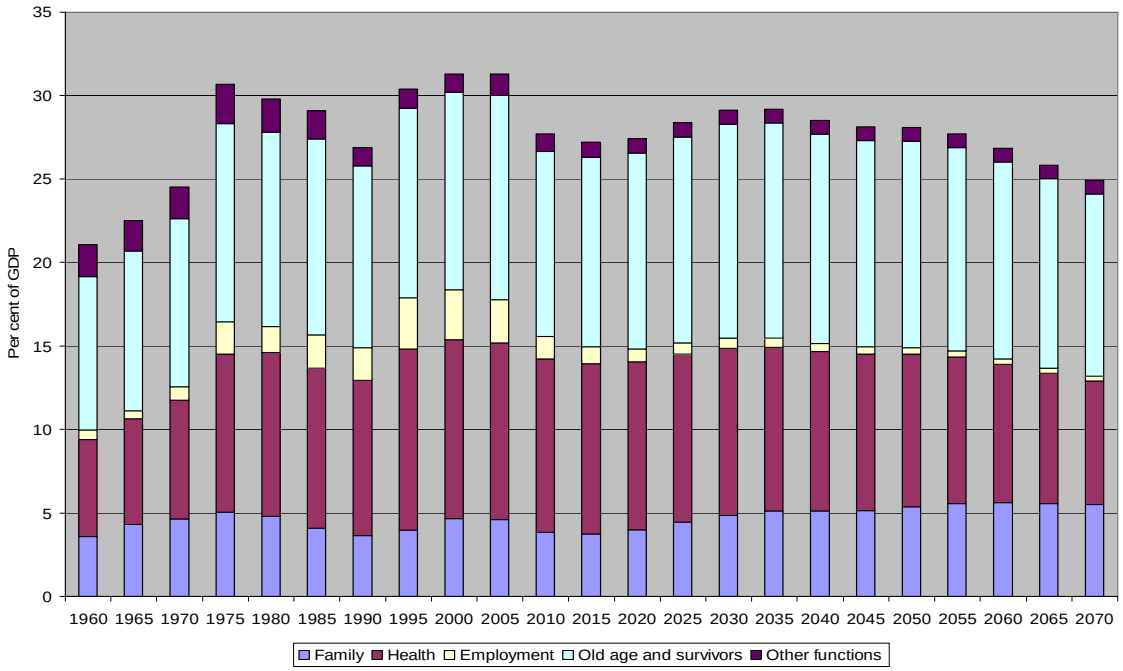
Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-b(2)*].

Figure 28b. Social expenditure ratio by functional categories 1960 to 2070 – pessimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-p(2)].*

Figure 28c. Social expenditure ratio by functional categories 1960 to 2070 – optimistic scenario

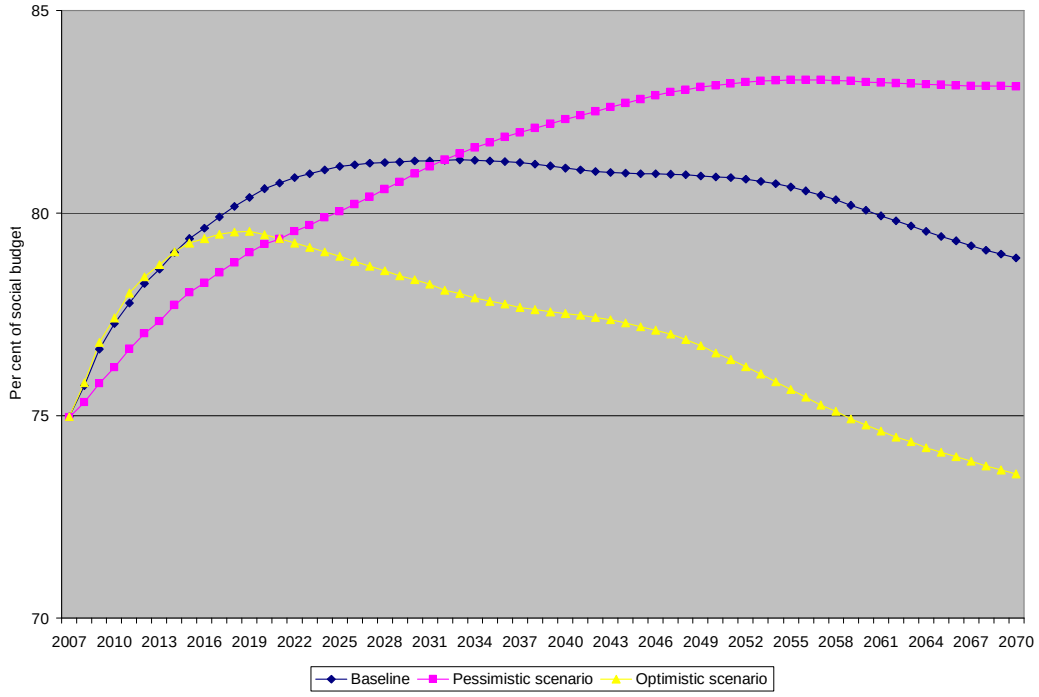


Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart1960-2070-o(2)].*

Significantly differing developments are being observed with respect to the relative weights of functional expenses (Figure 29):

- in the baseline, the two functions «health» and «old age», which traditionally dominate in Germany (as well as internationally), over the long run maintain and even increase their weight to around 80 per cent of the total social budget;
- in the optimistic scenario, their share falls to levels below 75 per cent (providing space for other social policy programmes);
- in the pessimistic scenario, the share of the two programs increases to almost 85 per cent of the total budget.

Figure 29. Functions «health» and «old age», aggregate share in total social budget – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart5(2)*].

3.2 Function health

Social spending under function health is allocated to four sub-functions, of which currently expenditure on (1) *prevention and rehabilitation* attracts 5 per cent, (2) *diseases* 68 per cent, (3) *work accidents and occupational diseases* 5 per cent, and *general invalidity* 22 per cent (all percentages 2007).

Under an institutional perspective health expenses of SHI, LTCI, CSMBS and CPW, together, represent about 83 per cent of total public expenses on health:

- SHI 61 per cent,
- CPW 10 per cent,
- LTCI 7 per cent, and
- CSMBS 5 per cent.

The remaining 17 per cent comprise payments of other schemes, like health-related spending of social assistance, or rehabilitation expenses of the social pension insurance.

Only for the pessimistic scenario our calculations show some long-term increase of the health expenditure share in GDP. In the base scenario the health expenditure share remains more or less stable, in the optimistic scenario it declines (Table 4; figure 30).

Table 4. Expenditure under function health in per cent of GDP

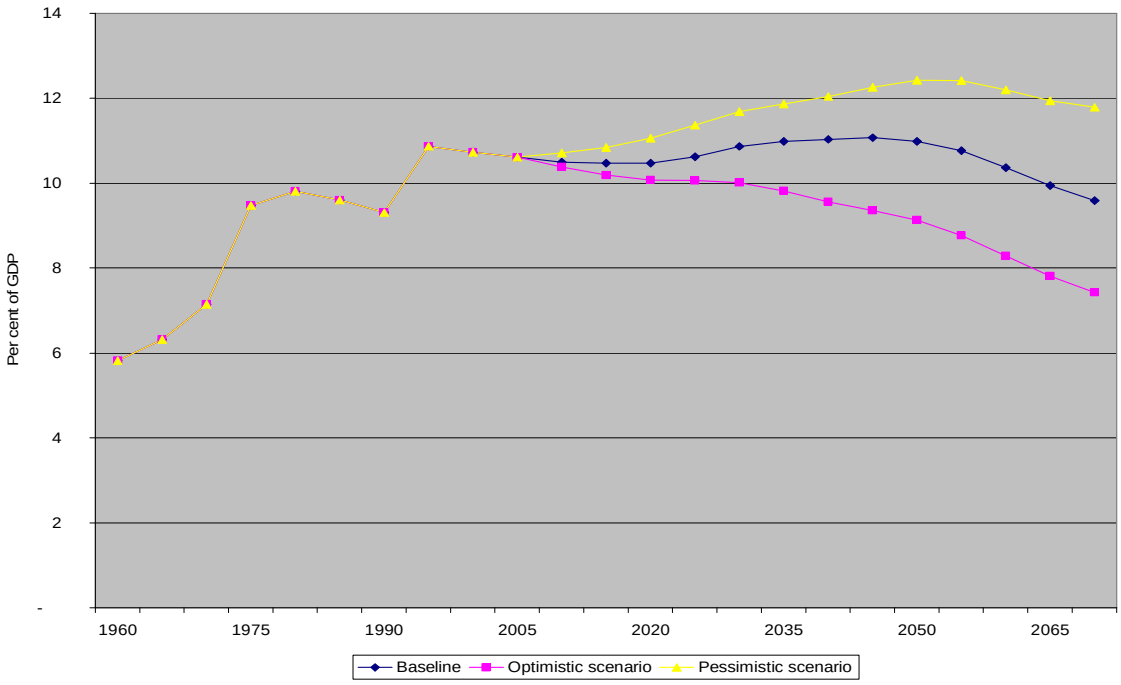
Year	Function Health		
	Baseline	Optimistic	Pessimistic
	Scenario		
	%		
2010	10.5	10.4	10.7
2020	10.5	10.1	11.1
2030	10.9	10.0	11.7
2040	11.0	9.6	12.0
2050	11.0	9.1	12.4
2060	10.4	8.3	12.2
2070	9.6	7.4	11.8

Source: Deutschlandmodell.

These results appear surprising as they do not confirm standard wisdom about the impact of ageing societies on health costs. Explanations are to be found in specificities of the German SHI that have been duely modelled. Also, certain hypotheses widely discussed in health politics have been applied in our modelling approach for the first time (chapter 3.2.1.).

Accordingly, public health finance has no severe expenditure control problems; to the contrary, it seems possible to keep costs under control despite the ageing of the German population (chapter 3.2.1.). This assessment does however not imply stable legal contribution rates, which continue to grow moderately. To the extent that the German society considers these increases as surpassing acceptable limits our results confirm that a reform of the financing basis of the German health system remains top on the social reform agenda.

Figure 30. Health spending share in GDP – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, ChartHealth*].

3.2.1 Social health insurance

National as well as ample international experience strongly indicates that health care costs can be expected, also in future, to grow *inherently* faster than societies' general incomes. There are mainly two reasons bolstering this assumption:

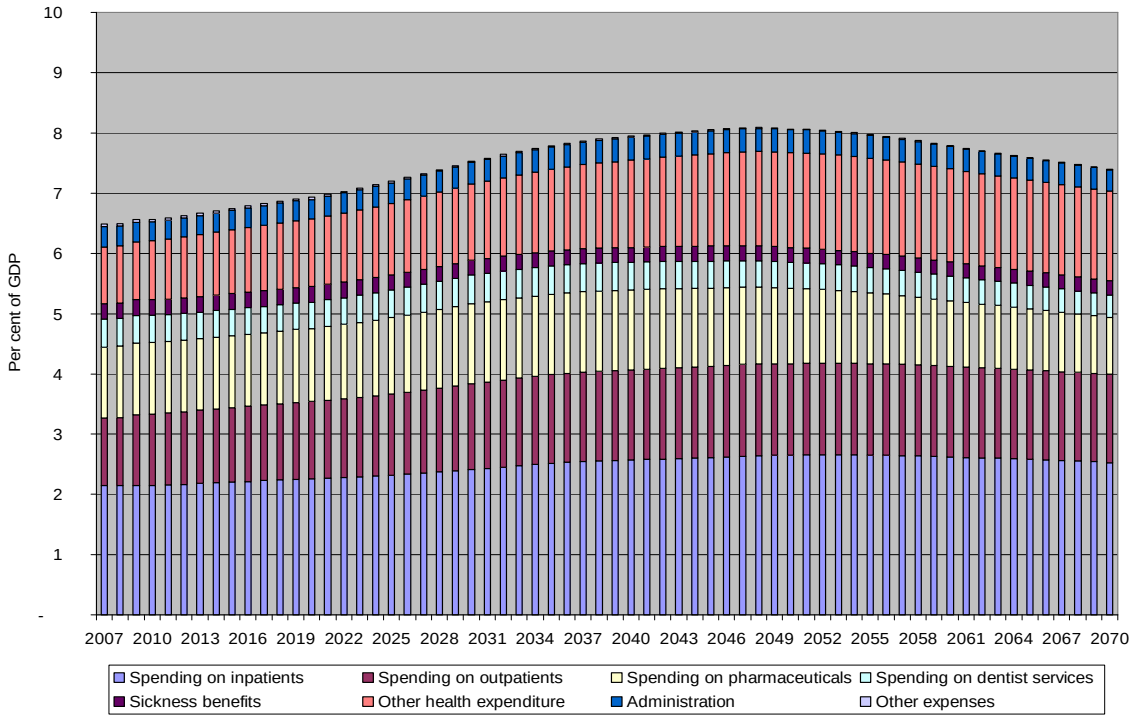
(1) technological progress increases also in future the variety and quality of products and treatments;

(2) even if technological progress were assumed cost-saving and reducing the relative prices of health products and services the overall expenditure may still rise because of the evidently high price elasticity of private households' demand for health care.

However, at the same time it has to be taken into account that the pressure through governments' *cost containment policies* increasing world-wide (i.e., not only in Germany) induces additional demand for cost-saving technologies and organizational structures.

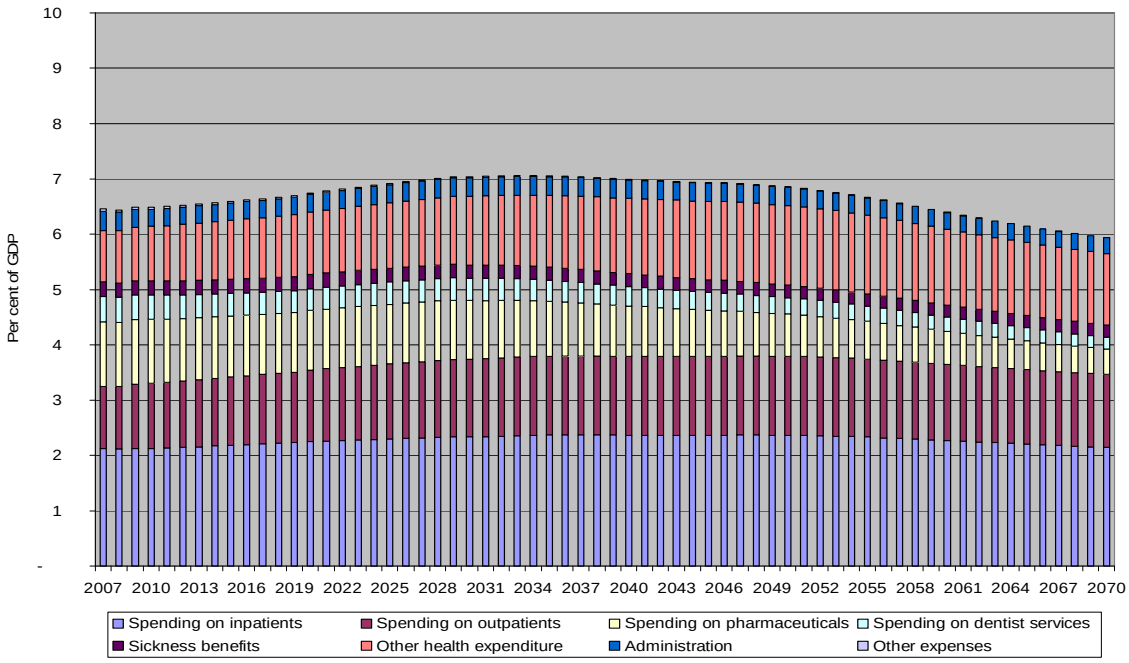
For Germany's SHI we expect the following developments of expenses in relation to GDP under the three scenarios (Figures 27a, 27b and 27c).

Figure 31a. SHI spending categories in per cent of GDP – baseline



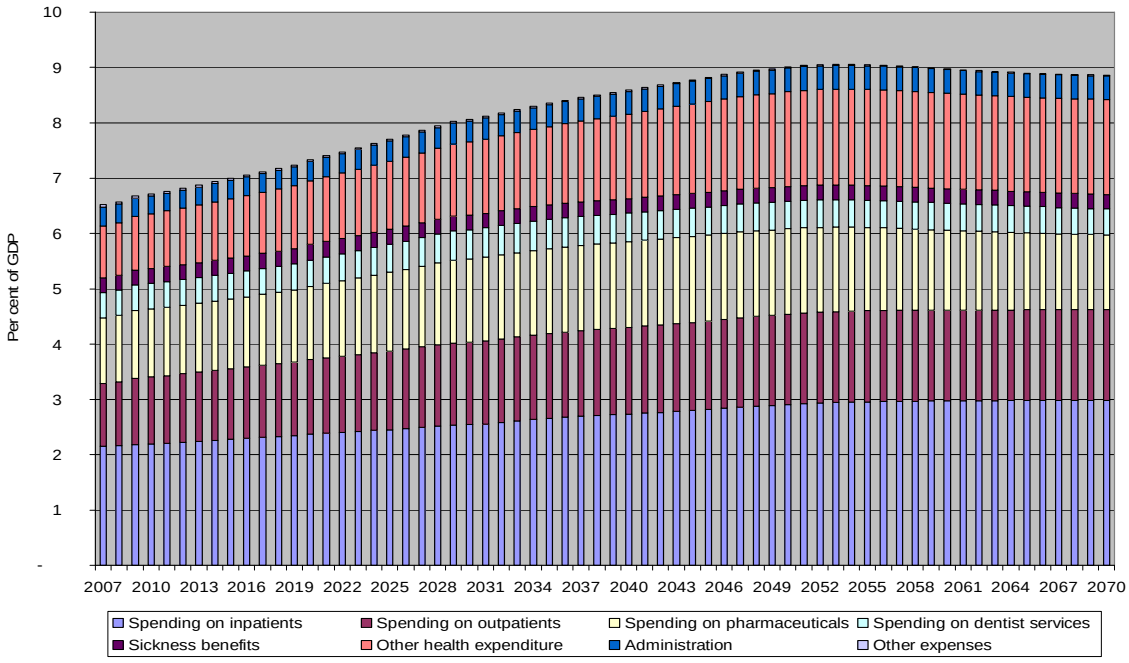
Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, SHI ChartBS*].

Figure 31b. SHI spending categories in per cent of GDP – optimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, SHI ChartOpt*].

Figure 31c. SHI spending categories in per cent of GDP – pessimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, SHI ChartPes*].

These results have been derived on the basis of the following specific characteristics of the health modelling approach applied (Annex 2), which, together, have substantial saving effects and, thus, moderate the overall health cost development:

Healthy ageing

The following three hypotheses on the relationship of technology and health status, discussed in literature, can be made reasonably operational in formal modelling contexts:

- the *compression of morbidity hypothesis* assumes, that an increase in longevity translates into an ever shorter share of life lived in relatively bad health;
- the *dynamic equilibrium* («healthy aging») *hypothesis* posits, that the absolute number of life-years lived in bad health remains constant in the wake of increased longevity;
- the *expansion of morbidity hypothesis* states that longevity translates into a higher share of life lived in relatively bad health, as older people become more vulnerable to chronic diseases and spend more time in ill-health.

We decided to apply the *dynamic equilibrium hypothesis* as it seems to be reflecting a middle path of future health cost implications of ageing societies. [69]

Death costs

There is strong empirical evidence that a very high share of an average person's life-time health care spending is concentrated on the final years of life. [70] In the SHI model the *death costs scenario* approach was taken into account by applying a technique which was developed for health care projections of EU member states in the European Policy Committee. In such a scenario the whole population (by sex and single ages) is split into two vectors: survivors and decedents (decedents = those who die, e. g., within a calendar year). Furthermore, the health care costs are separated into a demographic and a «closeness to death» component. As a result of such differentiation the *demographic* pattern of health care utilization, i.e. of those who survive is less steep; accordingly, the impact of the ageing of a population is less profound than in a less differentiated projection design.

Segmentation between SHI and PHI

In Germany's SHI, the share of privately insured is currently less than 5 per cent in the higher age groups of the population (80 years and above), whereas, for example, it is about 25 per cent among all men and 15 per cent among all women in the age group 40 to 44. The reason for this differentiation among generations is that in the past most persons, for cost reasons, switched from PHI to SHI once they reached higher ages (e.g., at retirement); as a result of such behavioural patterns, currently still the vast majority of older people is insured under SHI. (Figure 32)

[69] Adjustment of the model, and of its results, to the other two hypotheses is possible. However, the additional work required to modify the model, check results and offer proper interpretations, would have gone beyond the resources available under the project. Attached to this report is a CD that contains all modules used for our calculations. The interested reader / modeler is free to adjust those modules, and produce results, accordingly.

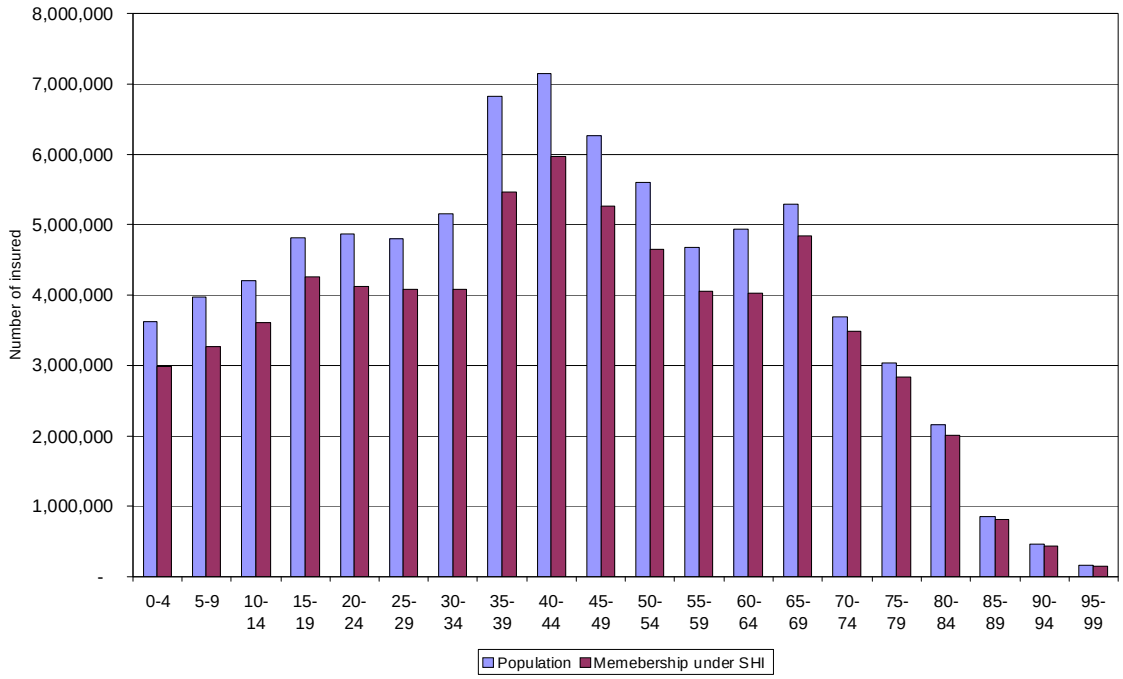
[70] This evidence must be taken into account under any of the three morbidity hypotheses.

This possibility of adverse selection – much to the advantage and profitability of the PHI (while putting the SHI under increasing financial pressure) – was abolished as a result of the various reform measures over the past 10 years: the way back to SHI has meanwhile been almost fully blocked for persons who had opted out (and chose joining PHI).

This important change in institutional regulation was taken into account in the here-applied model design. Accordingly, the share of privately insured elder persons within the total population increases over the next 40 years (and after) and reaches almost the same share that is currently observed among the cohort of persons aged 40-44: those who are currently privately insured will also be so in 40 years. The present PHI coverage of the age group of those 40-44 was chosen as a benchmark.

The financial implication is that in the decades to come a growing share of the health costs allotted to elder persons will be financed by PHI (which is not included in the social budget), and not any longer by SHI. As a result, the model correctly projects significantly less dynamic public health care expenditure than possibly suggested by other models which do not take account of those legislative changes.

Figure 32. Population and population covered under SHI - 2005

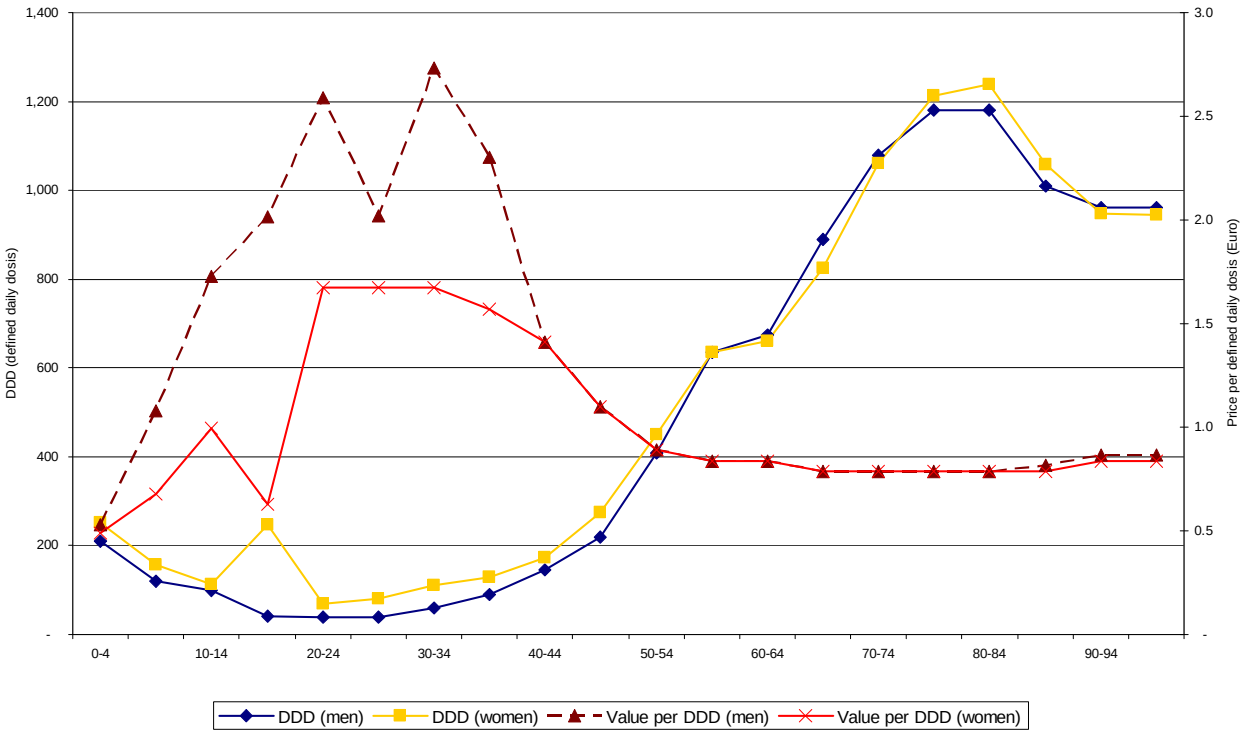


Source: Deutschlandmodell [*Health Module.xls, DIA Insured vs Population*].

Price vector of pharmaceuticals

To project the expenditure on pharmaceuticals an age-related *price vector* of pharmaceuticals (costs per *defined daily doses* (DDD) by sex and age group) has been applied; this approach is based on the observation that drugs prescribed for younger age-cohorts tend to be substantially more expensive than for older age-cohorts.

Figure 33. Prescribed defined daily doses (DDD) and average costs per DDD by sex and age group of population covered under SHI - 2005



Source: Deutschlandmodell; [*Result Sheets.xls, Graph Drugs(2)*].

Note: In 2005, on average per insured person, 8.4 packages of pharmaceuticals were described, presenting 413 defined daily doses. Accordingly, each package contained on average about 50 DDD.

At the same time, the age-related utilization pattern of prescribed drugs has the expected shape with an increasing number of prescriptions among the older age cohorts (typical J-curve).

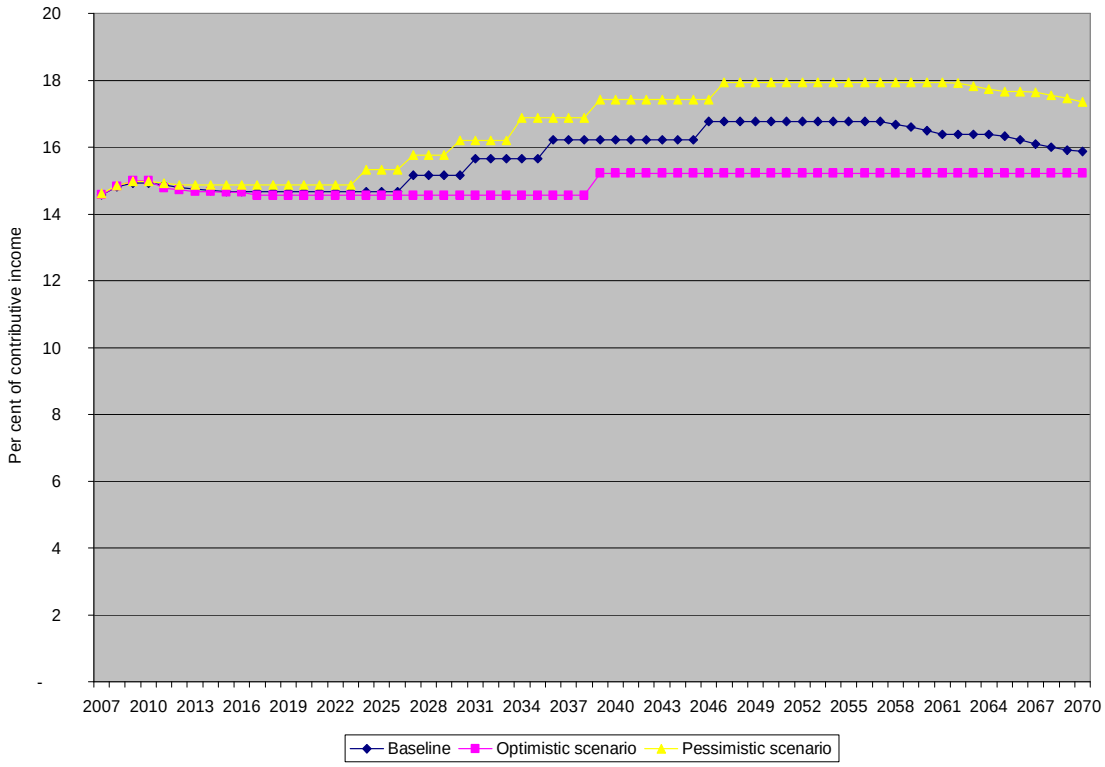
As a result, ageing has a cost-increasing impact on the financial projections of pharmaceutical spending through the utilization pattern, and a cost-saving impact through the price vector.

SHI revenue

At given average wages the total *income* of SHI is calculated as the sum of contributions and public subsidies. The contribution rate is calculated as a cost-covering PAYG-rate, i.e. after taking exogenous public transfers into account.

Despite the relative moderate expenditure development under all three scenarios, the impact on the legal contribution rate remains significant:

Figure 34. SHI legal contribution rate – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, SHI CR*].

While in all three scenarios the contribution rate can be kept in future for a number of years approximately at around the level reached in 2007 (14,6 per cent), from the mid-2020s onwards, it is only in the optimistic scenario that the rate can be stabilized at around 15 per cent. In the pessimistic case as well as in the baseline the health contribution rate reaches 18 per cent and (almost) 17 per cent, respectively, before both start decreasing slightly at the end of the projection period.

Stabilizing the contribution rate at 15 per cent would require, by the beginning of the 2020s additional public transfers to the SHI in the order of 0.5 (baseline) to 1.5 per cent (pessimistic scenario) of GDP.

Digression: The health fund

As of 1 January 2009 the Government introduced the so-called health fund. Its implementation has not, by itself, affected the calculation results as presented in this report; in other words: its introduction is neutral, at aggregate SHI level, with respect to expenditure and (resulting) contribution rates. However, the fund has changed significantly the financial architecture within the system of SHI, especially the provision of resources available to single public health insurances for their financial operations, as follows: [71]

[71] The following is only a rough description of a reform that was quite complex in its details. More information under:
http://www.bmg.de/cln_116/nn_1168682/SharedDocs/Standardartikel/DE/AZ/G/Glossarbegriff-Gesundheitsreform.html. (last visited 2008)

1. Insured contributors and employers pay contributions, calculated on the basis of a *uniform contribution rate*, into the fund. Also, public transfers are paid into the fund. This differs from the earlier regulation where all SHI organizations (institutions) collect their contributions directly on basis of their own specific contribution rates. The uniform contribution rate is now being fixed by the federal government in advance; the single SHI organizations lost authority of fixing the rate by themselves.

2. All SHI organizations receive their available resources from the fund as follows:

    a. a fixed, identical amount for each insured person covered by the respective organization; this amount does not vary among organizations;

    b. an additional amount, per insured person covered, that takes into account the different risks of the persons covered by the different organizations («risk adjusted component»); this amount can be positive or negative; risk adjustment is based on the following statistical indicators:

        - age of the insured;
        - sex of the insured;
        - morbidity of the insured: amounts reflecting special risks are paid in case of 80 highly cost intensive diseases, and for Disease Management Programmes.

With this financial management reform Germany joins the growing number of countries which base the allocation on service providers of available revenue of their public health systems on *capitation*.[72] Generally, capitation rates (= the amount of money to be allocated to service providers per insured person) can be interpreted as (risk adjusted) shadow contribution rates. Germany's health fund pursues a hybrid capitation approach in that it does not allocate available monies directly to service providers but to the public health insurers according to the health-risk structure of their insured members. Capitation systems are usually paid out of taxation and subject to standard (government) budget procedures. In their strictest versions, like for example in Thailand, capitation systems are based on closed-end budget principles, i.e. the health system (service providers) can expect as maximum public revenue the resources as stipulated in the budget. Germany continues to use its established and reliable contribution collection system as the main means for achieving the financial resources for the SHI; under the new rules a global budget for the health fund in year *t* is established by the end of year *t-1*; it is expected that this can usually be achieved, among others, by a point-forecast of the annual contribution rate to be applied in year *t* by the end of year *t-1* such, that it (together with other income, e.g. public transfers) covers total expenses, including the build-up of a cash (buffer) reserve in *t*.

The disadvantage of the new rule, from the point of view of public insurance, is that they are not able anymore to increase contribution rates autonomously; the advantage is that the budget (fund), once fixed, provides the public insurers with full income security – in years

[72] See Rice, Nigel and Peter Smith: *Approaches to Capitation and Risk Adjustment in Health Care*. An International Survey. The University of York. Centre for Health Economics. October 1999. Capitation rates can be interpreted as (risk adjusted) shadow contribution rates; see, for example, International Labour Office: *Thailand. Proposal for a Revised Capitation Calculation and Financial Equalisation System*. ILO component Financial Management of the Thai Health Care System (THA/05/01/EEC) under the Health Care Reform Project between the EU and the Kingdom of Thailand (THA/AIDCO/2002/0411); 2008.

when actual revenue collection falls behind the budgeted amount the opening gap will be covered (temporarily though) by a government loan, which is repayable in year t+1).

Another great advantage of the German health fund is that it allocates resources to providers on a (risk-adjusted) capitation basis; this measure, implicitly, aims at treating each patient (insured) on an equitable basis; it is hoped that this measure will have, over the long-term, positive health effects for the insured population.

International experience shows that allocation of resources to providers on the basis of *capitation is no guarantee* for effective health cost control, which has to be achieved by other, additional means of which some were being envisaged under the health system reform process. However, capitation opens the door to better balancing efforts aiming at enhancing *efficiency*, on which German health policies has been focused in the past, [73] with efforts aiming at guaranteeing *equitable* access to health services, an area where improvements are needed in future.

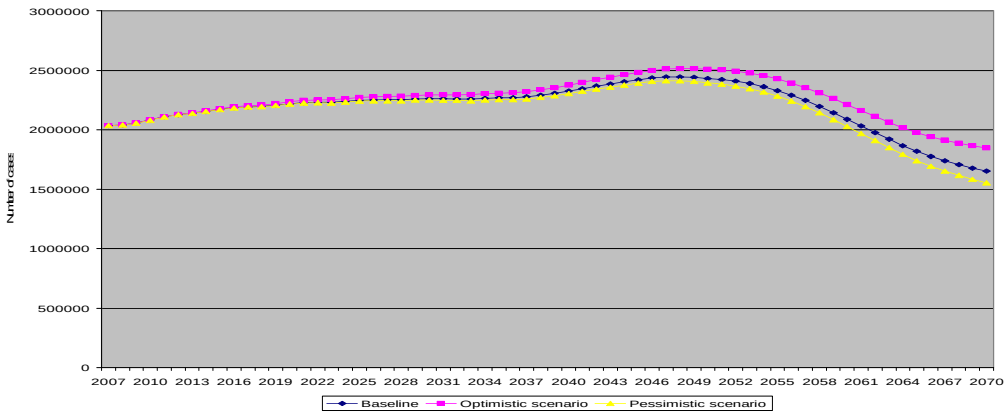
Despite some caveats, we believe that introducing the health fund (along with the accompanying risk adjustment measures) opens space for a unified design, on a scientific basis, of Germany's overall health system, which – while allowing the population to benefit maximally from medical and other health relevant progress – also offers options for needs-based steering of national health costs, and their control, accordingly. On this background, despite such hypothesis could neither explicitly nor implicitly be incorporated in the health sub-model, we expect that the health fund contributes in future to health cost containment (rather than the contrary).

3.2.2 Long-term care insurance

The calculations with respect to the LTCI are based on the same modelling principles, and the same hypotheses, as those for SHI (section 3.2.1). Accordingly, projections imply similar savings effects.

The number of cases under the LTCI increases, until around 2050, in all scenarios up to about 2.5 million, and then falls rapidly. This is basically a result of the population projection and the morbidity assumptions (as made in the SHI model). Due to the larger population, the number of cases is highest in the optimistic scenario.

Figure 35. Number of LTCI cases (inpatients and outpatients) – three scenarios



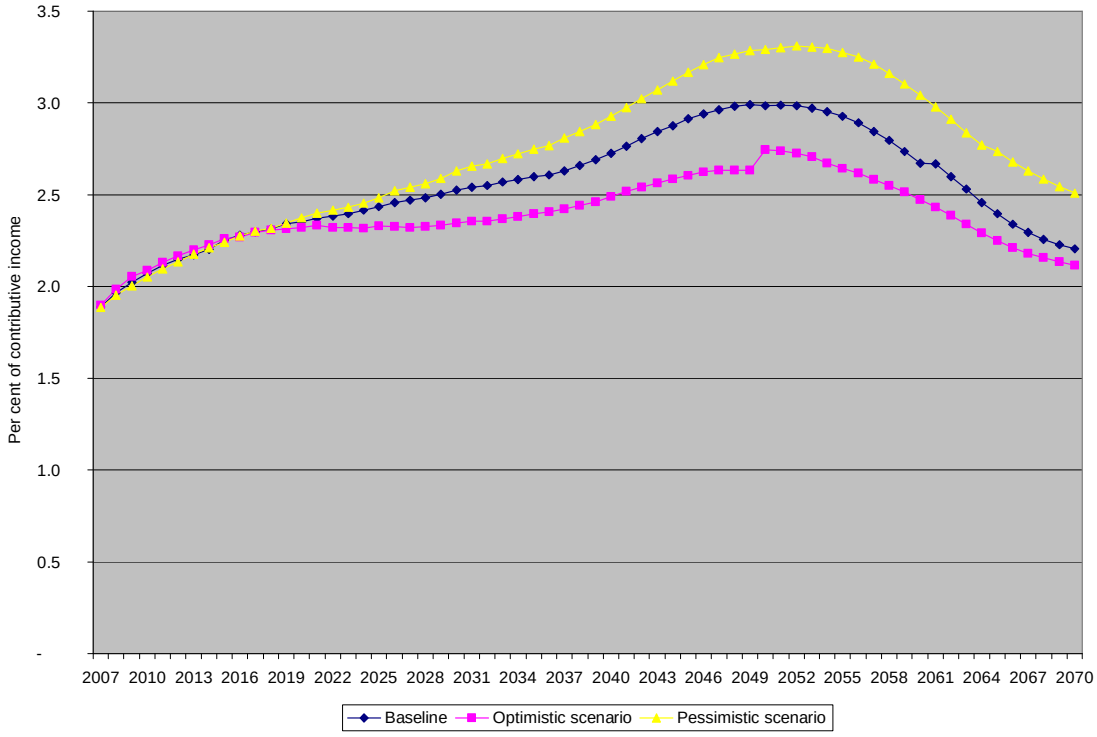
Source: Deutschlandmodell [*Result Sheets.xls, Chart2*].

[73] Rice, Nigel and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care. An International Survey. The University of York. Centre for Health Economics. October 1999.

LTCI expenditure per case in per cent of the national average wage («system replacement rate») increases from presently 35 per cent to between 38 and 40 per cent by 2020 (depending on scenario). In the subsequent years, it remains relatively stable, mainly as a result of the assumption that services provided are personal services and, thus, benefits per case are mainly driven by labour costs. (Annex tables 4g to 4i.)

On the basis of these calculations the contribution rate for the LTCI follows a development pattern similar to the one under SHI.

Figure 36. LTCI legal contribution rate – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, LTCI CR*].

3.2.3 Other health expenditure

Within expenditure of the function health we subsume, under *other health expenditure*, all spending not explained by SHI and LTCI. This includes, most prominently, CPW and spending under the CSMBS. [74]

[74] Function health also includes certain expenses of the occupational diseases and accident insurance; we assume that these spending are dominantly dependent, in their future development, by structural (sectoral) developments of the German economy, in general, and of the continued efforts of the employers to enhance work place safety. In the model approach used, it is implicitly assumed, that spending under the occupational diseases and accident insurance develops parallel to the spending under the SHI; to the extent that employers succeed in keeping the number of cases of occupational diseases and accidents low, and possibly even declining relative to general employment and production developments, the share of expenditure in GDP under the function health, ceteris paribus, would be (marginally) lower than calculated in the different scenarios of this report.

With respect to *CPW* we assumed the number of days of absence due to diseases in per cent of total working day volume constant over the full projection period. In other words, this benefit grows, in all scenarios, in parallel to the national sum of wages and salaries.

The payments under the CSMBS are dependent on the age structure of the civil servants, including retired civil servants. With respect to per-capita payments the expenses of the CSMBS follow – their dynamics - the same assumed rules and hypotheses as the ones developed under the SHI.

3.3 Function old-age and survivors

The function old-age and survivors mainly comprises expenditure under:

- the social pension insurance;
- the pension system of the civil servants;
- occupational pensions paid by enterprises,
- occupational pensions paid to former state employees.

These four programmes cover more than 90 per cent of the spending under this function. Special models were developed and applied to project the future expenses under the social pension insurance, and under the civil servants' pension system;[75] for occupational pensions no such model was developed. These two systems (social pension insurance, civil service pensions) explain more than 85 per cent of old-age spending in the German social budget. While projecting the total function we assumed that the occupational retirement income systems (and all other small items subsumed under the function) develop in parallel to the social pensions and the civil servants' systems. This might not be fully correct in all details; however, the systematic error made through using this approach is probably very small as all systems are facing more or less the same ageing problems.

Table 5. Expenditure under function old-age and survivors in per cent of GDP

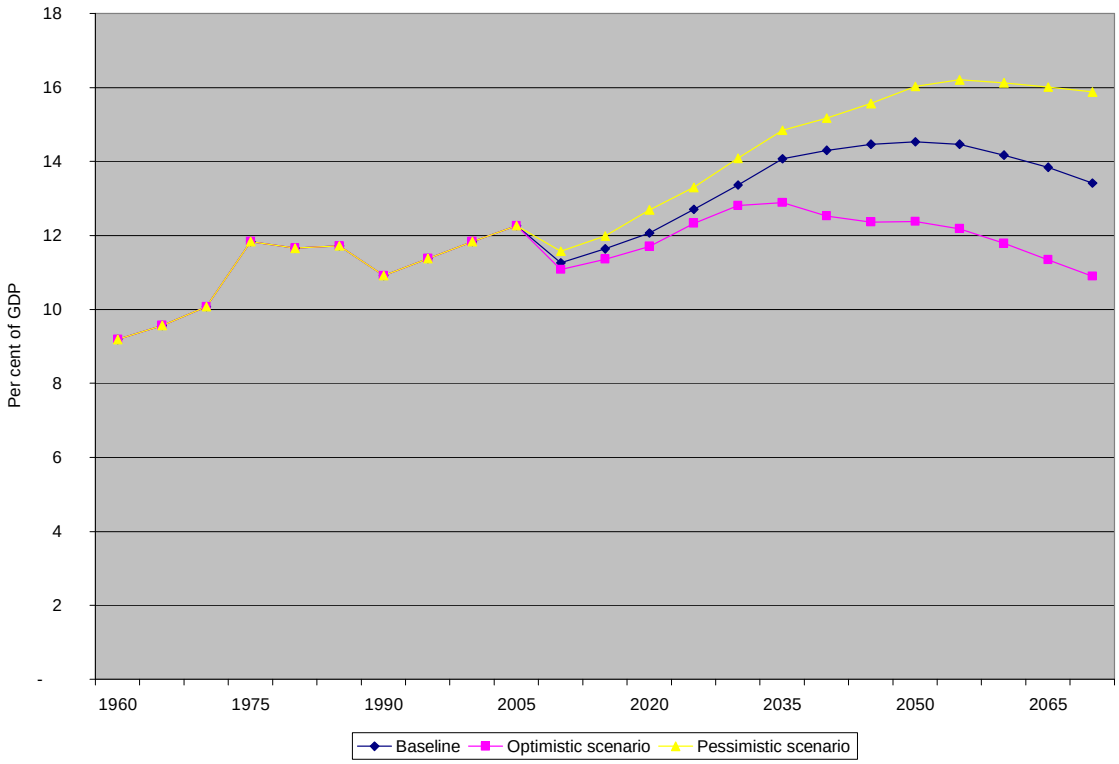
	Function Old-age and survivors		
	Baseline	Optimistic	Pessimistic
	Scenario		
Year	%		
2010	11.3	11.1	11.6
2020	12.1	11.7	12.7
2030	13.4	12.8	14.1
2040	14.3	12.5	15.2
2050	14.5	12.4	16.0
2060	14.2	11.8	16.1
2070	13.4	10.9	15.9

Source: Deutschlandmodell.

[75] The respective work was undertaken by Dr. Heinrich Jess, DRV-Bund, Berlin (for the social pension insurance, annex 3), and by Mr Harald Dalezios, University of Speyer (for the civil servants pension scheme, annex 4).

In all scenarios national spending on old-age and survivors relative to GDP increases to levels higher than during the past 40 years; in the pessimistic scenario, spending in relation to GDP after 2050 peaks at levels around 1/3rd higher than at present; in the baseline, the increase is half as high; only in the optimistic scenario levels remain broadly within earlier observed brackets. (Figure 37).

Figure 37. Spending on old-age and survivors, share in GDP – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Social Budget.xls, ChartOldAge*].

3.3.1 Social pension insurance (SPI)

The financial development of the social pension insurance (SPI) is determined by the number of pensions paid and by the average pension amount paid per case.

Figure 38 reflects the expected future number of pension cases. It stipulates that the number of pension cases over the next around 25 years is determined by the number and (age) structure of present contributors. In other words, whatever the assumed fertility rates and immigration assumptions, the magnitude of the number of future pensions will be affected only with a long time-lag. The same effects take place with respect to changes in the overall population development and its structure; figure 38 contains, for information purposes, the projected number of persons aged 65 and above in the total population. The observation that the number of SPI pension cases will be – for the next 25 years – substantially higher than the number of persons aged 65+ is owed to the fact that current pensioners include many cases of persons that retired before the age of 65, also it contains widow / widower and orphans' pensions, which – obviously – can be paid at younger ages.

However, the difference between the number of persons aged 65+ and the number of pension cases paid will gradually taper off and even change sign in around 2035; this development has the following reasons.

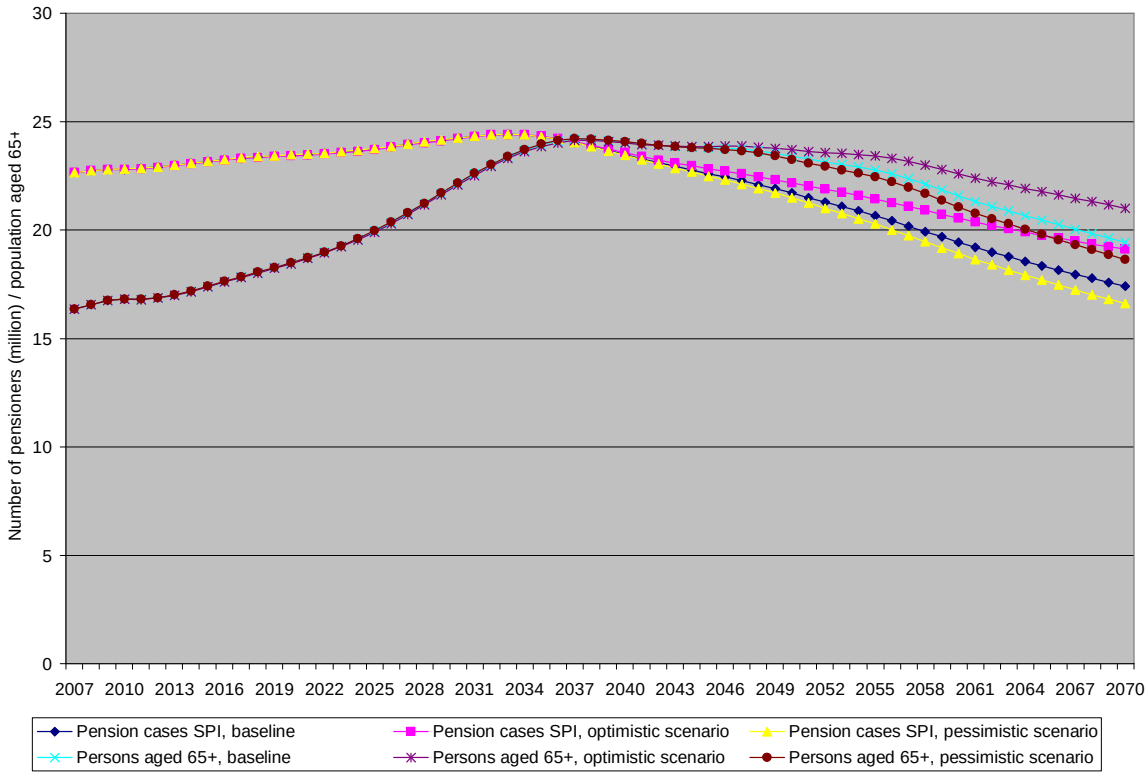
Because of relatively generous early retirement conditions in the past (incl. occupational incapacity) the number of pensioners is currently significantly higher than the population aged 65 and above. Until the mid-2030s the «baby boomers» will retire, however, as induced by the reform measures of the 1990s (1992, 1996), at higher average retirement ages than before, which will be continuously increasing, a process that has been re-enforced by the recent legislation with respect to increasing the standard retirement age to 67.

Simultaneously, the number of occupational incapacity pensions will decline (at assumed unchanged entry rates) because younger cohorts are smaller than their predecessors in the second half of the previous century.

Furthermore, the increase of female employment, as assumed in all scenarios, results in declining numbers of widow(er) pensions (as own pension entitlements, achieved through employment, are being taken into account in the calculation of widow(er) pensions).

The weights of all mentioned effects are increasing over time such that as of around 2040 the total number of pensions paid under the SPI falls below the number of persons aged 65 and over.

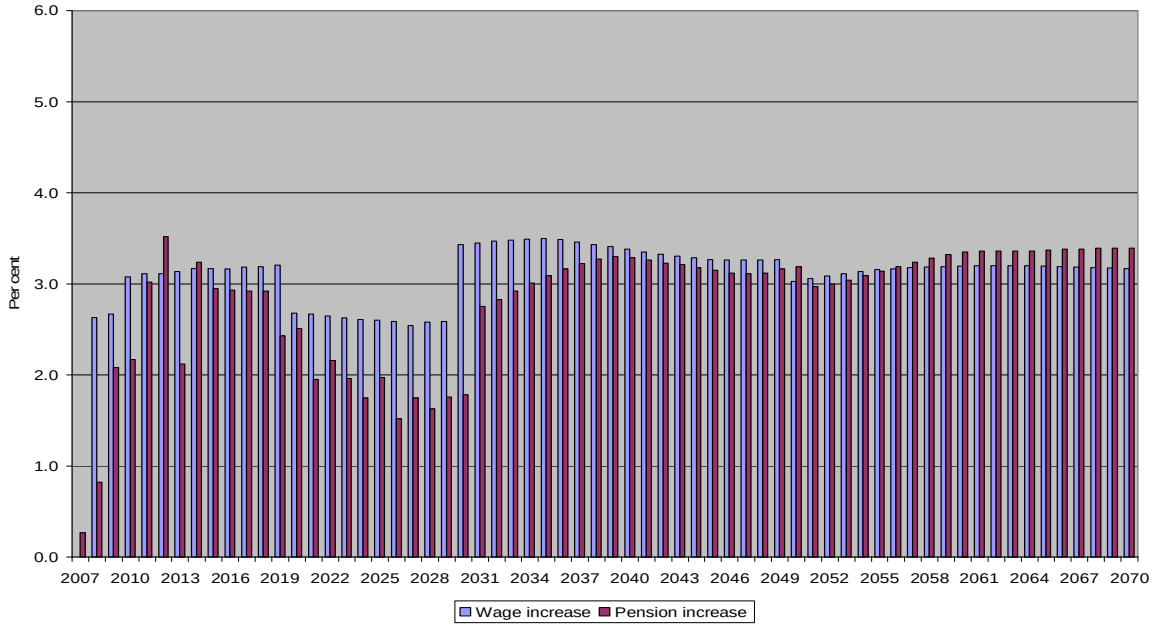
Figure 38. Number of pensions paid by social pension insurance (SPI) and population aged 65 and over – three scenarios



Source: Deutschlandmodell *[ILOBAS0408.xls, SPI PensCases]*.

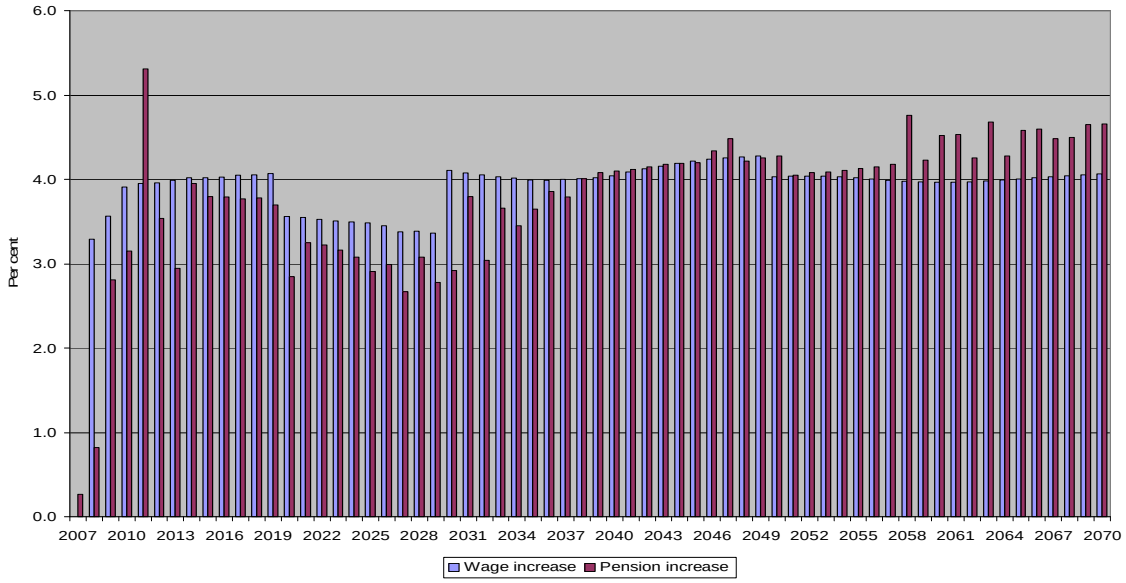
The sequence of figures 39a to 39c reflects pension indexation in comparison to gross wage dynamics. In the baseline as well as in the pessimistic scenario the annual pension increases are until the 2050s lower than the wage increases; it is only in the optimistic scenario that pensions and wages begin to develop in parallel again in the 2030s.

Figure 39a. Per capita wage development and pension adjustment – baseline



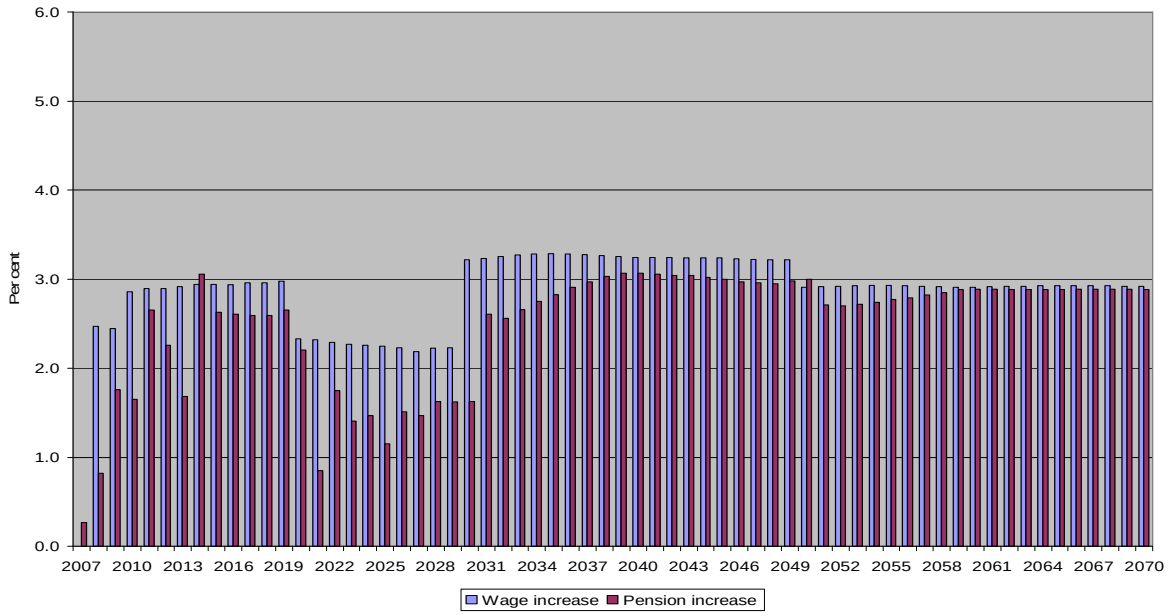
Source: Deutschlandmodell [*ILOBAS0408.xls, SPI AdjBAS*].

Figure 39b. Per capita wage development and pension adjustment – optimistic scenario



Source: Deutschlandmodell [*ILOBAS0408.xls, SPI AdjOPT*].

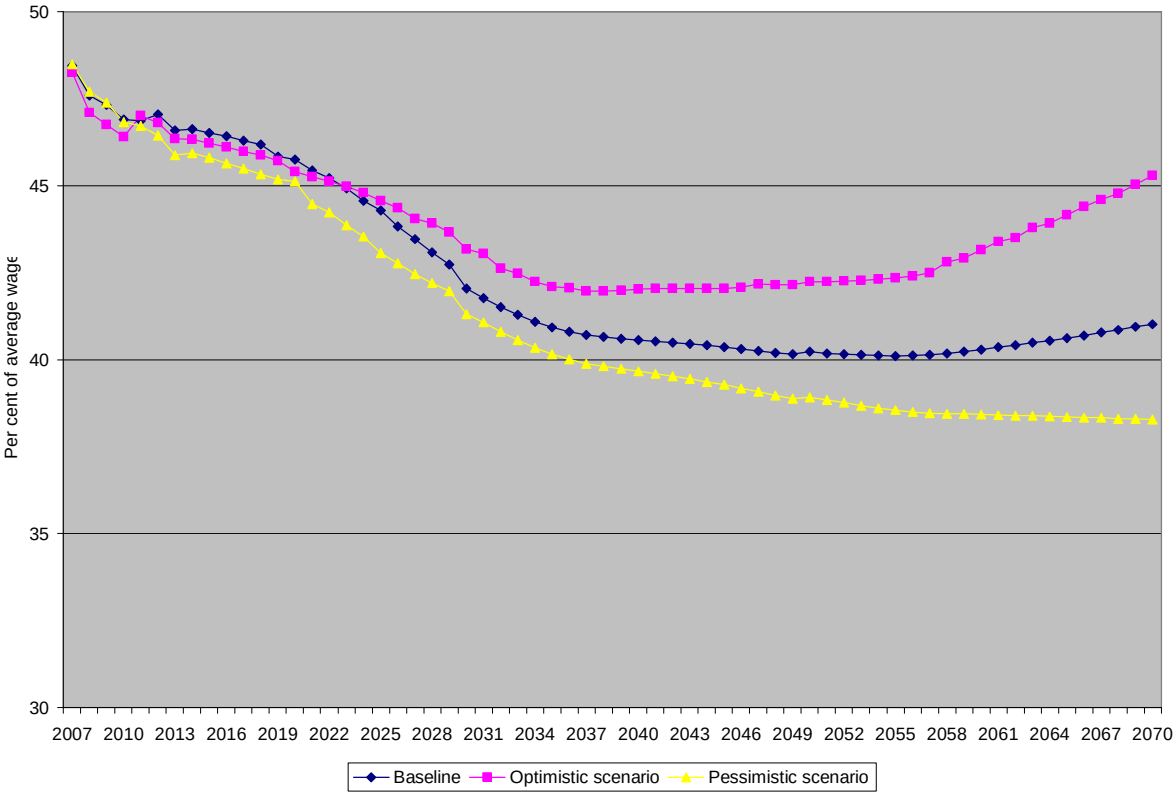
Figure 39c. Per capita wage development and pension adjustment – pessimistic scenario



Source: Deutschlandmodell [*ILOBAS0408.xls, SPI AdjPES*].

The difference between gross wage development and pension adjustment (according to the legal pension adjustment formula) leads to a systemic decline in the SPI pension replacement rate in all scenarios (figure 40)

Figure 40. SPI pension replacement rate – three scenarios



Source: Deutschlandmodell *[ILOBAS0408.xls, SPI Replacement*].

Within the projection horizon of our model calculations the bottom of replacement is reached

- In the *baseline*, in 2055, when the replacement level is 17 per cent [76] lower than in 2007;
- In the *optimistic scenario*, in 2037, when the replacement level is 13 per cent lower than in 2007; and
- *In the pessimistic scenario*, in 2070, when the replacement level is 21 per cent lower than in 2007. [77]

SPI revenue

In the SPI revenue and expenditure parameters are dynamically interlinked by way of the design of the pension adjustment formula. This formula is quite complex; it is not being explained here in detail. Its basic idea, however, is that

- the pension adjustment is reduced whenever the legal contribution rate increases, or when
- the pensioner-to-contributor relation increases (and vice versa). [78]

The annual contribution rate, thus, is dependent on the volume of pension expenses, but also on revenue other than contributions, including, especially, the federal state transfer, which was calculated at 27 per cent of pension expenditure. [79] Furthermore, the contribution rate has to be fixed such that total SPI revenue covers administration costs (which are very low in international comparison) and the build-up of a modest reserve («sustainability reserve»).

In our calculations we introduced the exogenous condition that the contribution rate must not exceed 22 per cent of contributive wages. The resulting relative pension-increasing effects and the impact on the balance were taken into account and compensated by respective increases in the federal subsidy.

The results of our calculations with respect to contribution rate development and the federal subsidy are as follows (figures 41 and 42):

[76] In relative terms, not in % -points.

[77] We would like to emphasize that our calculations refer to the “gross pension replacement rate” (Bruttorentenniveau); in other words, we make no statements here with respect to §154 SGB VI, which stipulates that a specifically defined net-replacement rate (irrespective of taxation) must not fall short of a certain minimum value. Furthermore, the pension adjustment formula was left unchanged for the period after 2030.

[78] Using «equivalent pensioners» and «equivalent contributors»; see glossary.

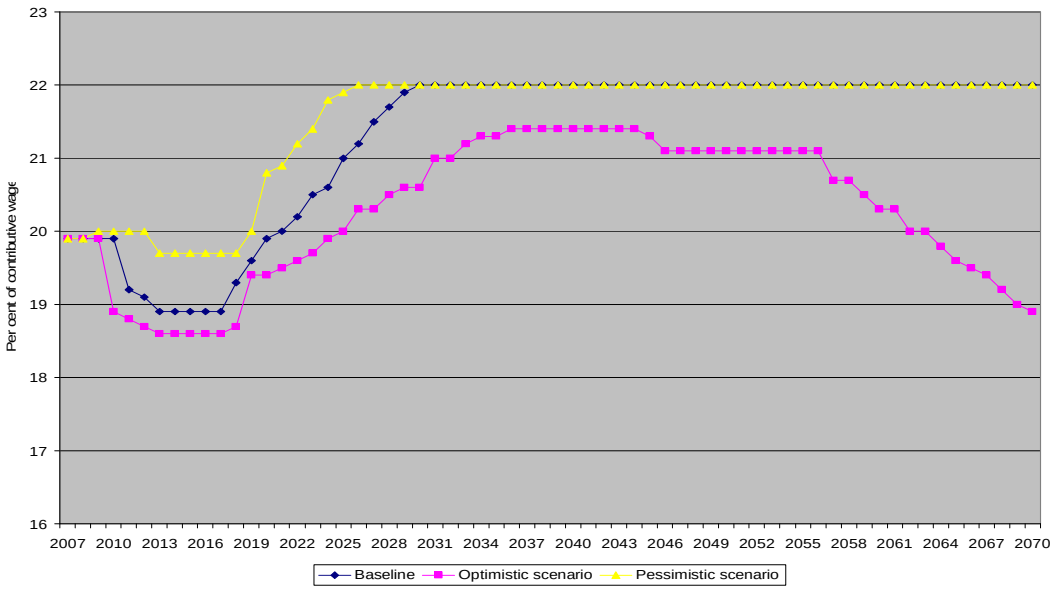
[79] The fixing at 27 per cent of the federal state transfer is a modelling simplification of the complex two-staged calculation as stipulated by law and underlying each budget year. Any difference between the detailed annual budget calculations (based on the law) and the shortcut taken (exogenous fix of the rate at 27 per cent) is irrelevant with respect to the long-term results of our calculations.

In all scenarios, the contribution rate tends to fall over the next few years and is kept relatively stable over the following (around) 10 years. In all scenarios the rate starts increasing before 2020.

Only in the optimistic scenario the contribution rate remains clearly below 22 per cent over the full projection period; accordingly, no additional federal subsidy is required. In the baseline and the pessimistic scenarios, however, the contribution rate reaches the 22 per cent boundary relatively fast: in the baseline in 2030, in the pessimistic scenario already in 2026.

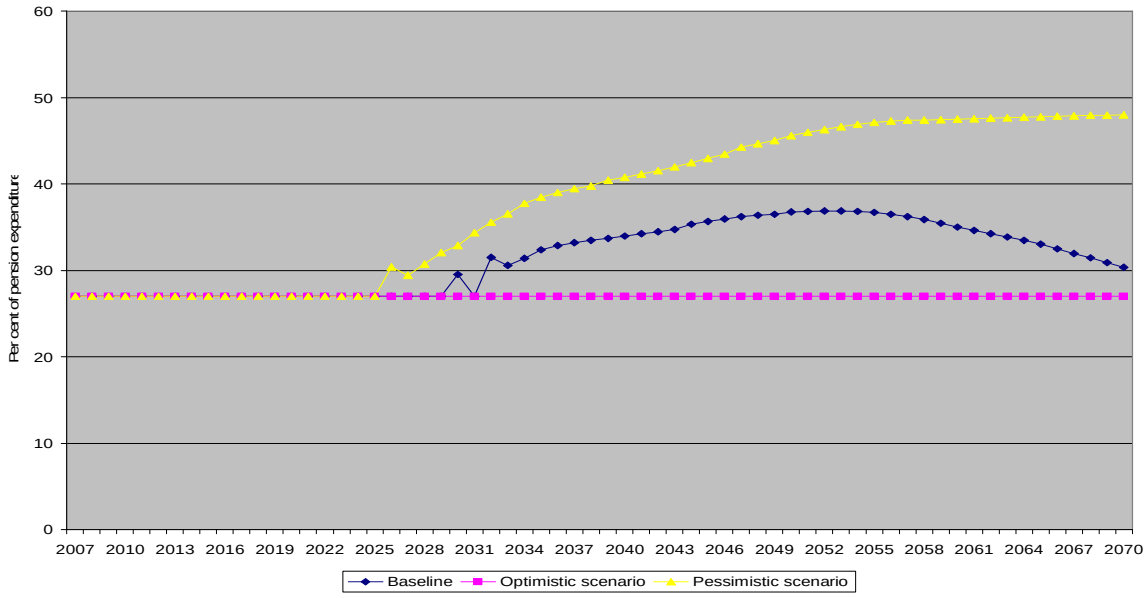
Accordingly, in both scenarios, the federal subsidy has to be increased as long as pension cuts are to be avoided. In the baseline, the subsidy reaches a maximum of almost 37 per cent of pension expenses by the beginning of the 2050s, in the pessimistic scenario the subsidy starts increasing in 2026, reaching its maximum of 48 per cent of pension expenditure in 2070.

Figure 41. SPI legal contribution rate – three scenarios



Source: Deutschlandmodell [*ILOBAS0408.xls, SPI CR*].

Figure 42. SPI federal transfer – three scenarios



Source: Deutschlandmodell [*ILOBAS0408.xls, SPI Subsidy*].

In comparison to GDP the subsidy required in addition to status-quo would amount, in the long run, to annually

- slightly above 1 per cent of GDP in the base scenario (starting in 2030), and
- about 1.5 per cent of GDP in the pessimistic scenario (starting in 2026). [80]

These substantial additional amounts would have to be borne by the federation. However, given that the states will be relieved, relatively, from public education system burdens (kindergartens, schools, universities) [81] re-arrangements of the sharing of fiscal burdens between the federation and the states / municipalities should be possible. If, furthermore, federal and state budgets fix their revenue in relation to GDP, we consider it realistic to pursue a policy that would stipulate, at unchanged benefit formulae, a maximum SPI contribution rate (e.g. of 22 per cent) while covering the resulting SPI deficit out of general taxation.

3.3.2 Civil service pensions

The number of retired civil servants, including surviving orphans and spouses, increases between 2007 and 2025 by around 475 thousand cases, which is an annual average of plus 26 thousand persons. In all scenarios the total number reaches its maximum of 1.8 million

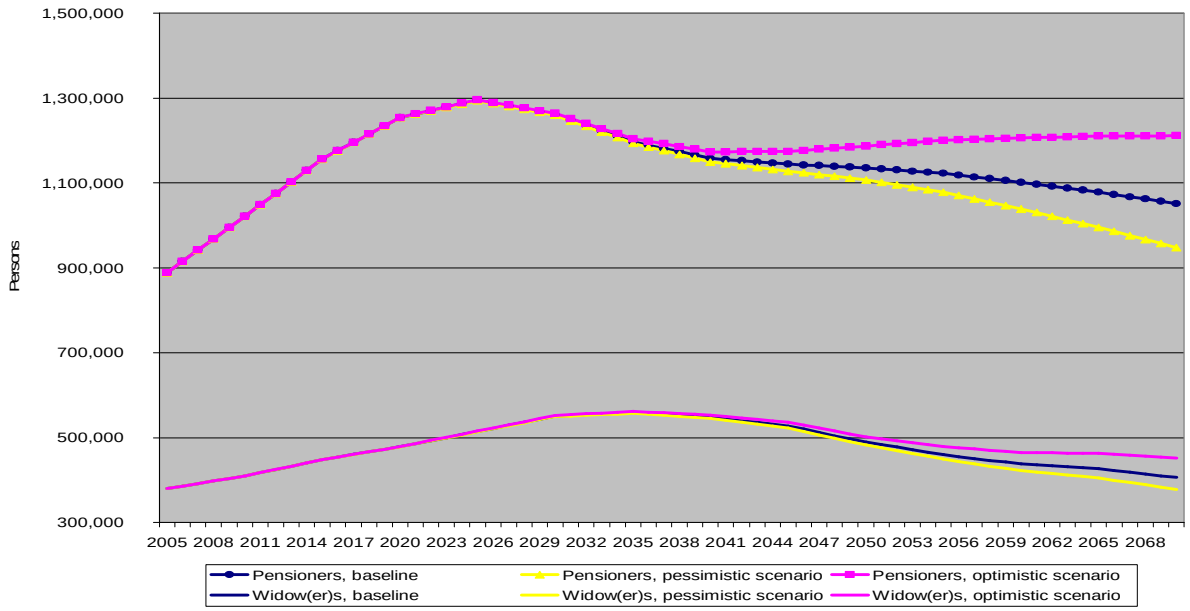
[80] In both cases the additionally required subsidy (in per cent of GDP) would gradually build up over time.

[81] In both, the baseline and the pessimistic scenario the number of youth declines as a result of the assumed fertility rates and immigration assumptions; also, there is a societal move towards education in private schools which is complemented by increasing co-financing of public universities through students' tuition fees.

during the second half of the 2020s, and starts continuously declining thereafter in the baseline and the pessimistic scenario.

Under the optimistic scenario numbers stabilize at the far end of the projection period because, as assumed, the state maintains the number of active civil servants in all scenarios in a constant relation to the overall population (which increases in the optimistic scenario), an assumption that, in the long run, results in more retiring civil servants (figure 43). [82]

Figure 43. Civil service, number of pensioners and survivors – three scenarios



Source: Deutschlandmodell [*Result Sheets.xls, CicServPens*].

The increase over the next two decades is basically fuelled by the additional number of civil servants that was hired between 1967 and 1982 (plus around 350 thousand), who are now about to retire or will do so over the coming years.

In order to prepare for the financial consequences of the increase legislation under the SPI scheme was transferred, analogously, to the civil servants pension scheme. This means, in essence, that *average pension* will over the coming years be effectively reduced (in relation to civil servants salaries) by about 10 per cent (figure 44). It should be noted that the replacement rate calculated for the civil servants differs from the respective rate under the SPI in that the SPI-replacement rate is a synthetic indicator constructed on the basis of typified assumptions (= pension entitlements of a contributor who fully worked over 45 years and in doing so always earned the national average wage), whereas the civil service pension replacement rate has been calculated by annually dividing (i) the total sum of civil servants' pensions per retired civil servants by (ii) the sum of civil servants wages per active civil servant.

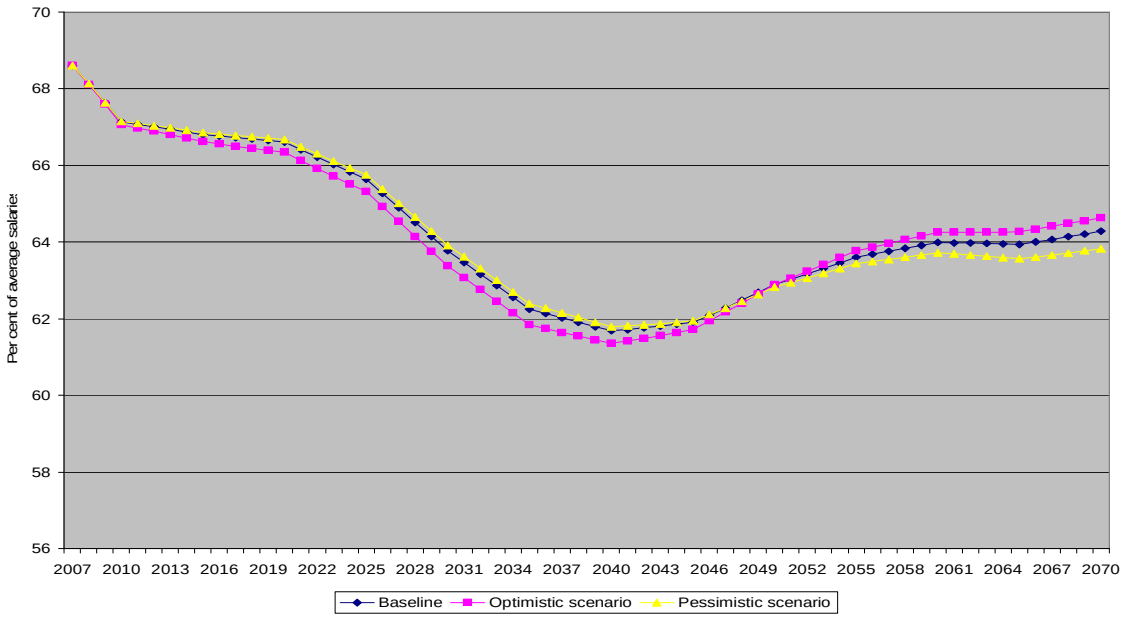
While the development of the SPI replacement rate is synthetic, the development of the civil servants' rate, as calculated, is a system rate. Under this method of calculation the average civil service pension consists over many years, i.e. until around the mid-2030s of a

[82] Annex 4 contains a description of the civil service pension model.

mixture of «old» pensions that had been awarded before the recent savings measures, and the new ones that are increasingly affected by those measures. It is only in and after the 2030s that the full effect materializes in the average pension replacement rate.

The slight increase of the civil service pension replacement rate in and after the 2040s is mainly a result of the assumption that, by then, all civil servants retire at age 67, and no deductions from pensions are being made anymore at retirement.

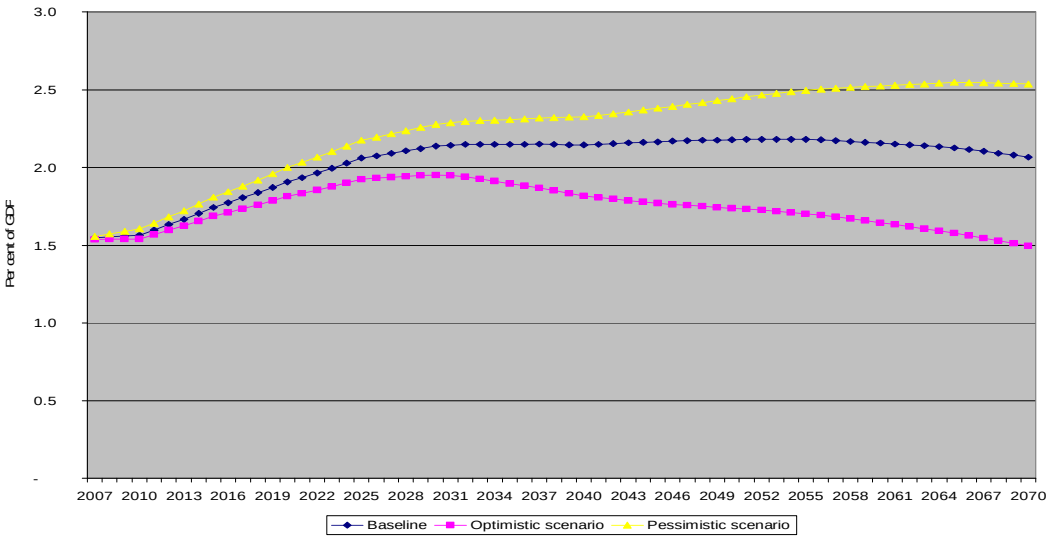
Figure 44. Civil service: average replacement rate of retirement pension – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Economy Part 2 new.xls, CicServReplacement*].

Under the explained assumptions the sum of civil servants pensions, in per cent of GDP, develops as reflected in figure 45.

Figure 45. Civil service, pension expenditure in per cent of GDP – three scenarios



Source: Deutschlandmodell [*Result Sheets.xls, CicServPensGDP*].

In the pessimistic scenario, pension expenditure for civil servants increases structurally, in the long run by around 2/3rd of its present level. In the baseline, the increase is around 1/3rd whereas, in the optimistic case, pension expenses increase for a relatively short transitory period, followed by a long-term decline.

3.3.3. Other age-related expenditure

No specific models were developed for the other two programmes of financial weight under the old-age and survivors function, i.e. for the occupational pensions paid by enterprises and by the state to their former employees (non-civil servants).

The specific long-term modelling problem of enterprises' occupational pensions is the assumption setting on new contracts as these determine the (time-lagged) long-term development of expenditure. While this is comparatively easy in case of modelling an individual company's occupational pension scheme, as the company's policy is known, it is more complex to make such assumptions, in a globalized economic context, for the whole industry as companies' readiness to engage in occupational pensions may vary with international economic developments, in short: with the future structure of Germany's economy, which to model was not within the scope of our research.

Occupational pensions paid by the state cannot, in the long-run, be seen independent form developments in the enterprises sector. As long as occupational pensions play a significant role in the enterprises sector it can be assumed that the state will maintain its respective policy with respect to its own employees. This may be the case even more so under a demographic scenario leading sooner or later to labour shortages rendering it possible that occupational pensions regain one of their traditional roles[83] of being an element of competition among employers for qualified (scarce) labour.

Implicitly, by our approach of taking these schemes' financial development only cursorily (as constant ratio within overall old-age and survivors spending) into account, it was thus assumed that these systems continue, like in the past, to contract with new employment and that they, as a result, face the same demographic problems as the two that were given specific attention.

3.4. Function employment

Function employment comprises expenditure in case of unemployment, occupational training and spending to enhance the (occupational, spacial) mobility of the unemployed (and employed). While measures under training and mobility comprised over many years in the past around 1/3rd of all spending subsumed under the function employment, this share has been substantially reduced through the labour market reform legislation as implemented in 2005, and is assumed to be further reduced. In other words, spending under the function employment meanwhile increasingly reflects merely income (cash-benefits) paid to the unemployed.

[83] Occupational pensions not only play a role in the individual remuneration contract of employees but their purpose was, and possibly might be again, to bind employees to their enterprises / employers.

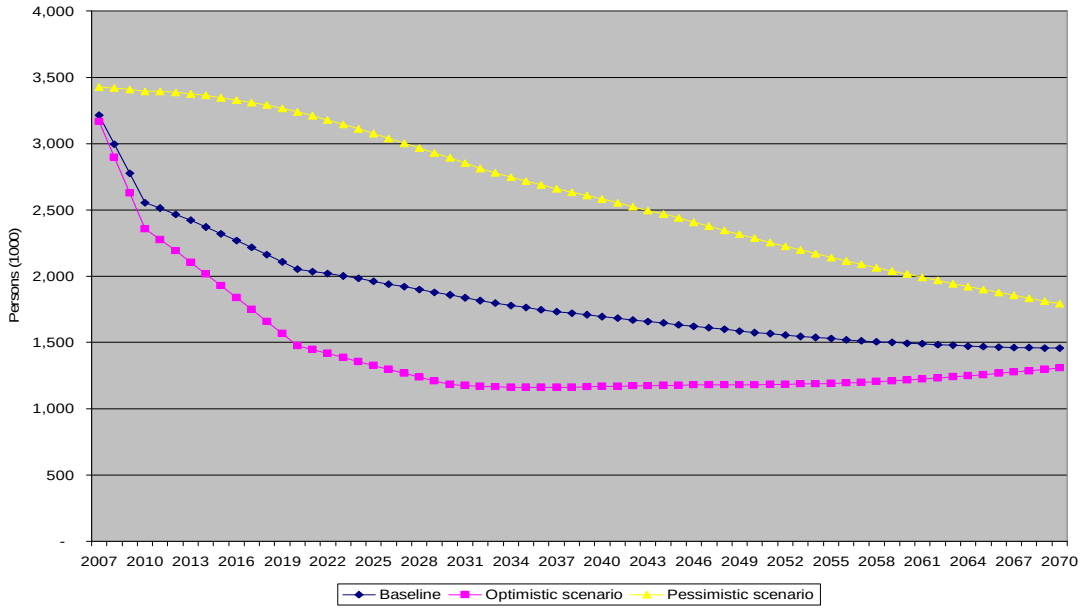
Table 6. Expenditure under function employment in per cent of GDP

Year	Function Employment		
	Baseline	Optimistic	Pessimistic
	Scenario		
	%		
2010	1.4	1.4	1.8
2020	1.1	0.9	1.5
2030	1.0	0.8	1.4
2040	0.9	0.7	1.2
2050	0.8	0.7	1.1
2060	0.7	0.7	0.9
2070	0.6	0.7	0.8

Source: Deutschlandmodell.

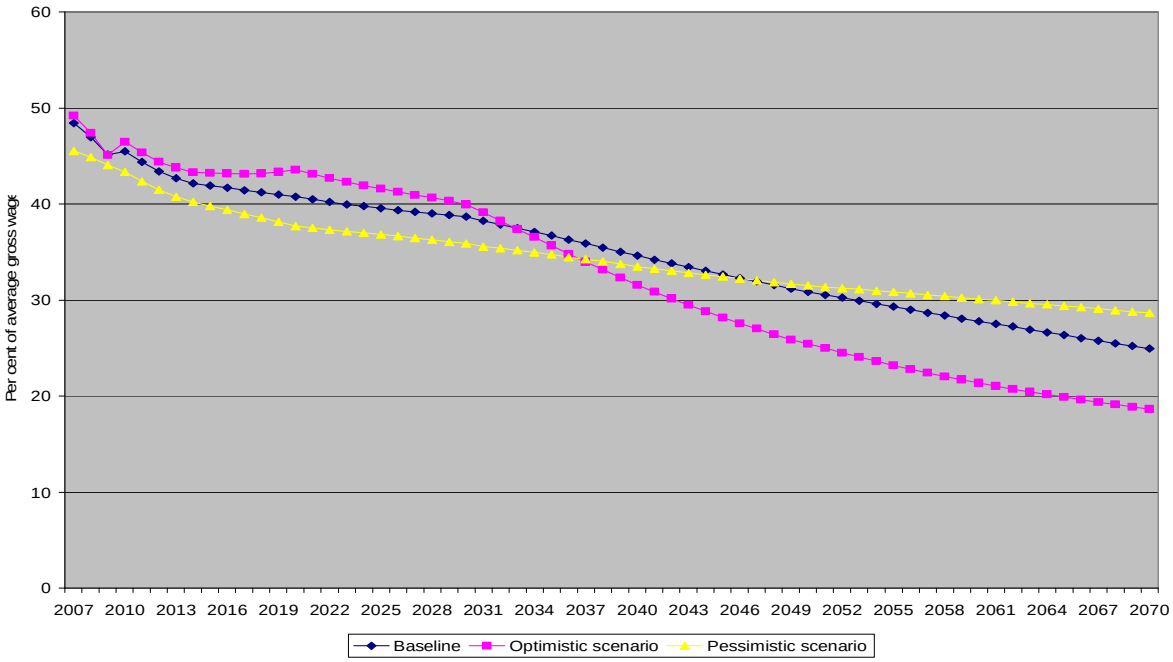
The future development of the expenses under the function employment is therefore mainly a function of the number of unemployed and the average benefits paid. The number of unemployed is given through the macro-economic assumptions (figure 46); the average benefits are (mainly) composed out of *ALG1* and *ALG2*. The development of average ALG1 is a function of average gross wage developments; average ALG2 – given its role of guaranteeing unemployed households' income at subsistence levels – is a function of price development. In the long run it is assumed that the number of beneficiaries will be composed mainly of recipients of ALG2. As a result the average benefit paid per unemployed declines relative to the national average wage (figure 47).

Figure 46. Unemployment – three scenarios



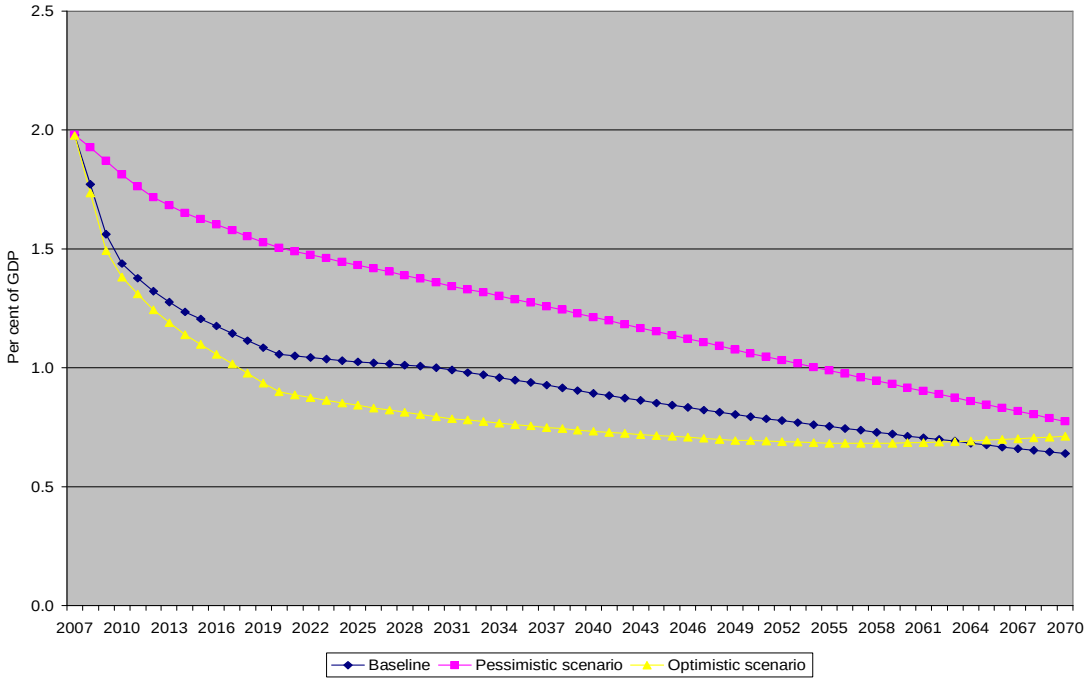
Source: Deutschlandmodell [*Result Sheets.xls, UE*].

Figure 47. Unemployment: average replacement rate – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Economy Part 2 new.xls, UEReplacement*].

Figure 48. Function employment in per cent of GDP – three scenarios



Source: Deutschlandmodell [*Blueprints.xls, UIGDP*].

Revenue

As result of the assumed favourable development of unemployment and of spending on the unemployed the legal unemployment contribution rate will fall to low levels in the baseline and in the optimistic scenario (around 2 per cent, and around 1 per cent, respectively); only in the pessimistic scenario will it remain at present levels of around 3.5 per cent.

3.5. Function family

Function family comprises benefits paid under a set of various programmes, like:

- maternity benefits paid by employers and SHI;
- education grants to young parents;
- family-related fringe benefits paid by private and public employers;
- youth aid, and
- child benefits (tax benefits).

The amounts paid under the above list comprise currently over 90 per cent of all expenditure paid under the function family. About 2/3rd of the above list is being granted in the form of tax benefits.

Table 7. Expenditure under function family in per cent of GDP

Year	Function Family		
	Baseline	Optimistic	Pessimistic
	Scenario		
	%		
2010	3.9	3.9	4.1
2020	3.6	4.0	3.8
2030	3.8	4.9	3.7
2040	4.3	5.2	3.6
2050	4.5	5.5	3.6
2060	4.7	5.7	3.6
2070	4.8	5.6	3.6

Source: Deutschlandmodell.

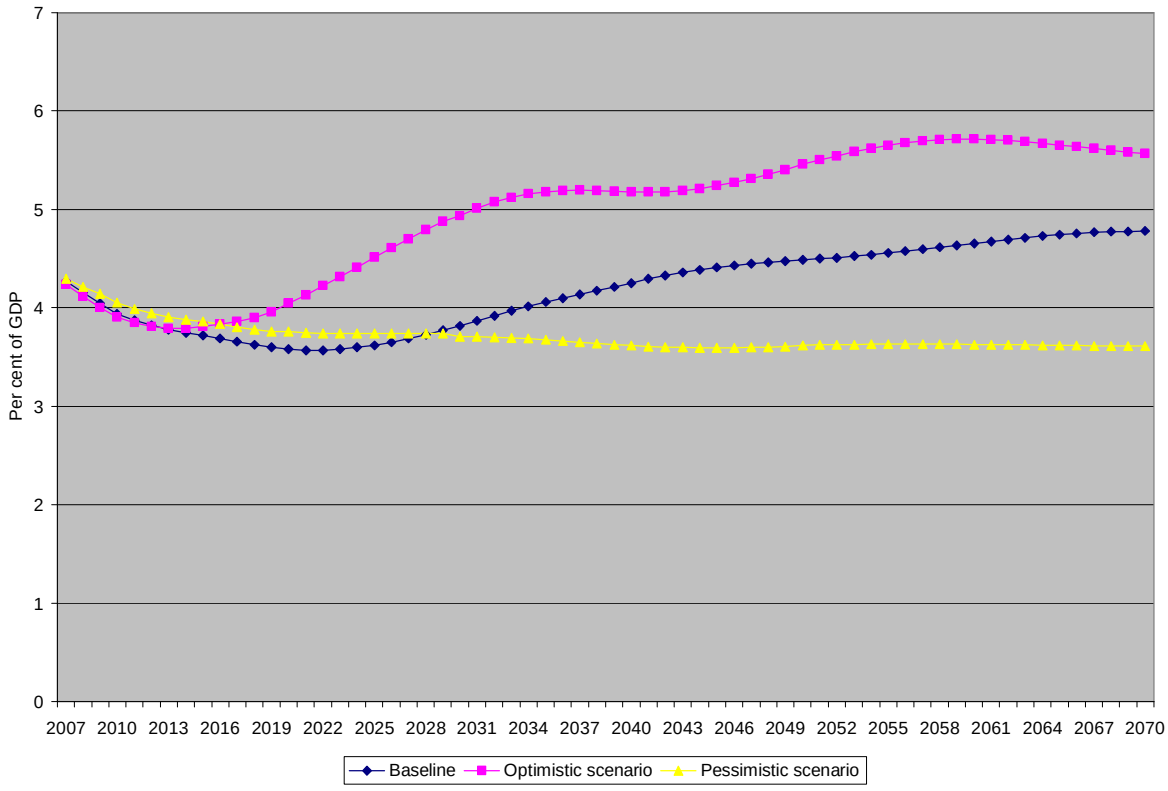
For our projections we used an approach assuming that the expenses under the family function can be linked to a volume indicator and a price indicator.[84] As a *representative* for the volume indicator we took the number of persons aged zero to 19 (being aware that some benefits only apply in case of a child born (e.g. maternity benefits), while others also apply in case of children aged above 19); as price *representative* we took the national average wage. The latter assumption is questionable in the short run as it were only valid, in a strict sense, in case the parameters governing family benefits were regularly indexed with gross per capita wages (which is not the case); however, it appears reasonable in the longer run, as a continued non-indexation policy over three generations (until 2070) would

[84] The most appropriate modelling approach for tax credits is to take explicitly into account income (wage) distribution information in a micro-simulation context. Such resource-absorbing techniques would have gone beyond the scope of the project underlying this report.

imply almost complete withdrawal of the state from family oriented tax (and direct cash payment) policies.

Therefore, at given average gross wage developments, family expenses vary mainly with the fertility and migration assumptions under the three scenarios.

Figure 49. Function family in per cent of GDP – three scenarios



Source: Deutschlandmodell [*Blueprints.xls, FamGDP*].

It should be mentioned that, for methodological reasons,[85] investment in additional kindergarten places (according to the 2007-programme initialized by the federal government), is not included in the above calculations; however, the federal government's assumptions with respect to additional current expenses of the states over the period 2007 to 2010 – 1.5 billion Euro annually[86] – have been incorporated.[87]

[85] The social budget, by method, only incorporates benefit-related current expenditure and revenue.

[86] It is assumed that these are mainly labor costs. See: Bundesministerium fuer Familie, Senioren, Frauen und Jugend (BMFSFJ): Kindertagesbetreuung fuer Kinder unter drei Jahren. Bericht der Bundesregierung ueber den Stand des Ausbaus fuer ein bedarfsgerechtes Angebot an Kindertagesbetreuung fuer Kinder unter drei Jahren. Juli 2007.

[87] We assume that payment of these additional expenses continues after 2010, adjusted with per capita wages and with the number of persons in the age group zero to 19.

3.6. Spending on other functions

The remaining functions are expenditure on / for reasons of:

- political events;
- housing;
- promotion of savings, and
- general social aid.

Together, they comprise currently only around 4 per cent of the total social budget, or slightly above 1 per cent of GDP.

Table 8. Expenditure under other functions in per cent of GDP

Year	Other functions		
	Baseline	Optimistic	Pessimistic
	Scenario		
	%		
2010	1.1	1.1	1.1
2020	0.8	0.9	0.9
2030	0.8	0.8	0.8
2040	0.8	0.8	0.8
2050	0.8	0.8	0.8
2060	0.8	0.8	0.8
2070	0.8	0.8	0.8

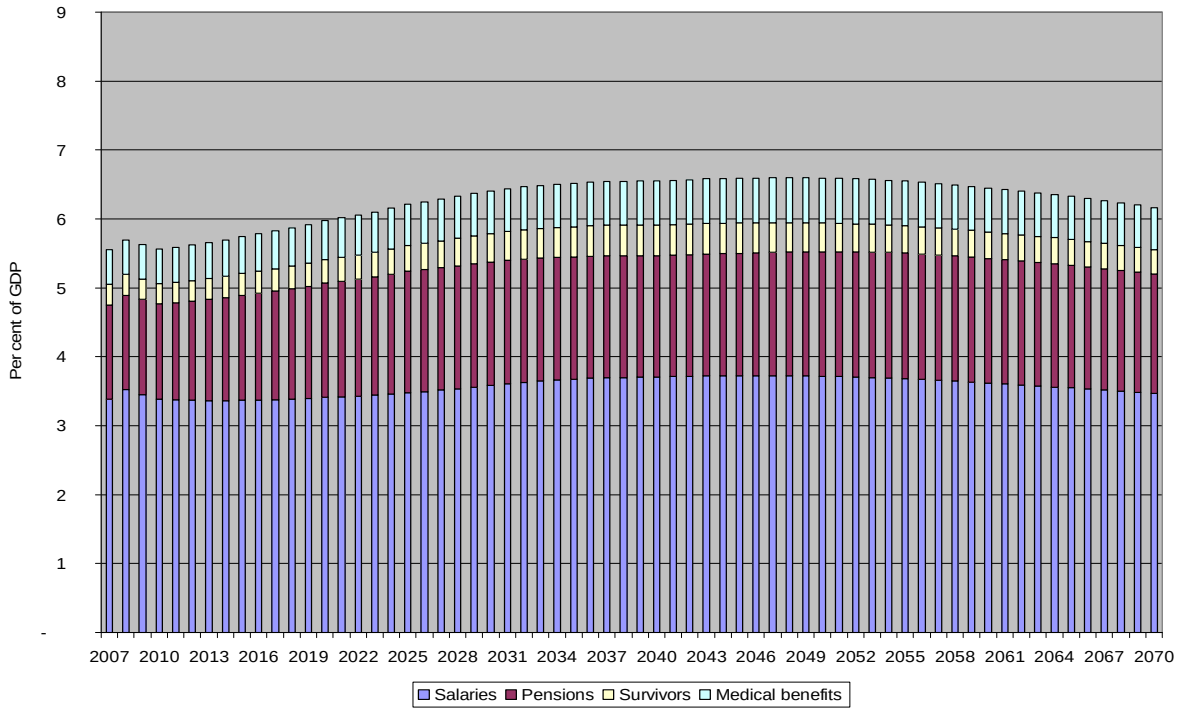
Source: Deutschlandmodell.

Because of their nature, we assume that spending under the function *political events* gradually vanishes, and no longer exists as of the mid-2020s in all three scenarios; function *housing* develops in all scenarios as a constant ratio of GDP; promotion of savings is assumed to remain constant at 1 billion Euro from the mid-2010s over the full projection period – this development pattern was assumed in reaction to the newly introduced voluntary pension savings scheme («Riester»), for which the federal government offers growing fiscal subsidization, but which is not being incorporated in the calculations of this report; finally, function *general social aid* was assumed to increase in parallel with GDP.

3.7. Digression: Civil servants full remuneration package

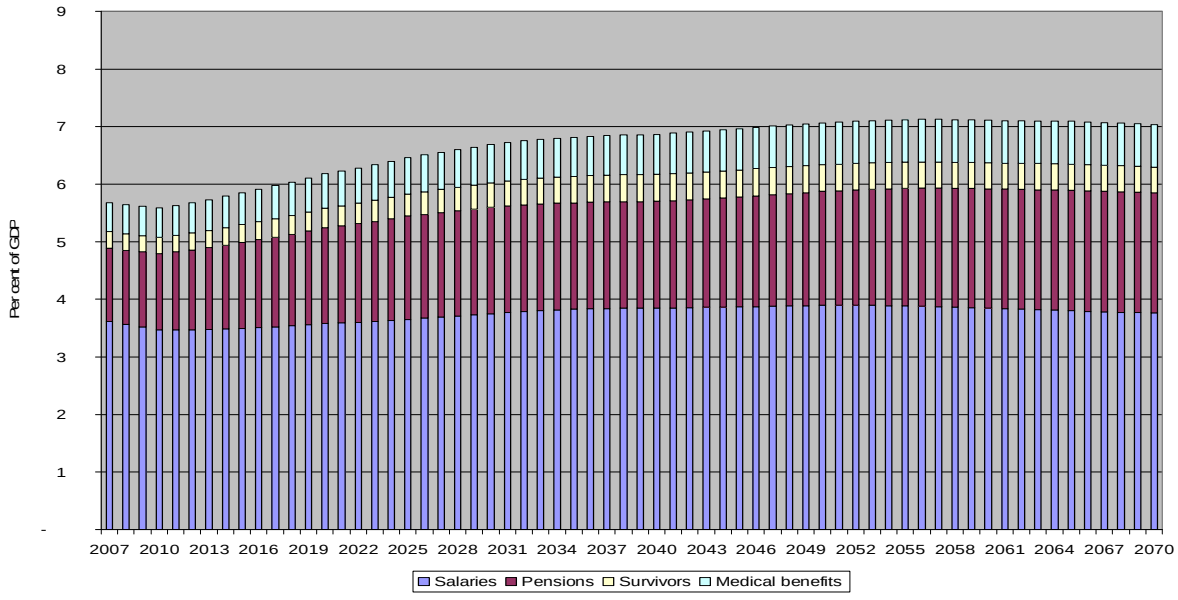
For the state, in its role as employer, but also for the general public in its role as tax payer, the costs of the «full remuneration package», i.e. salaries plus pensions plus medical benefits for the civil servants is of same, if not even of wider interest than the pension payments. The sequence of figures 50a to 50c reflects the development of the full remuneration package of civil servants under the three scenarios.

Figure 50a. Civil service: cost of total remuneration package in per cent of GDP – baseline



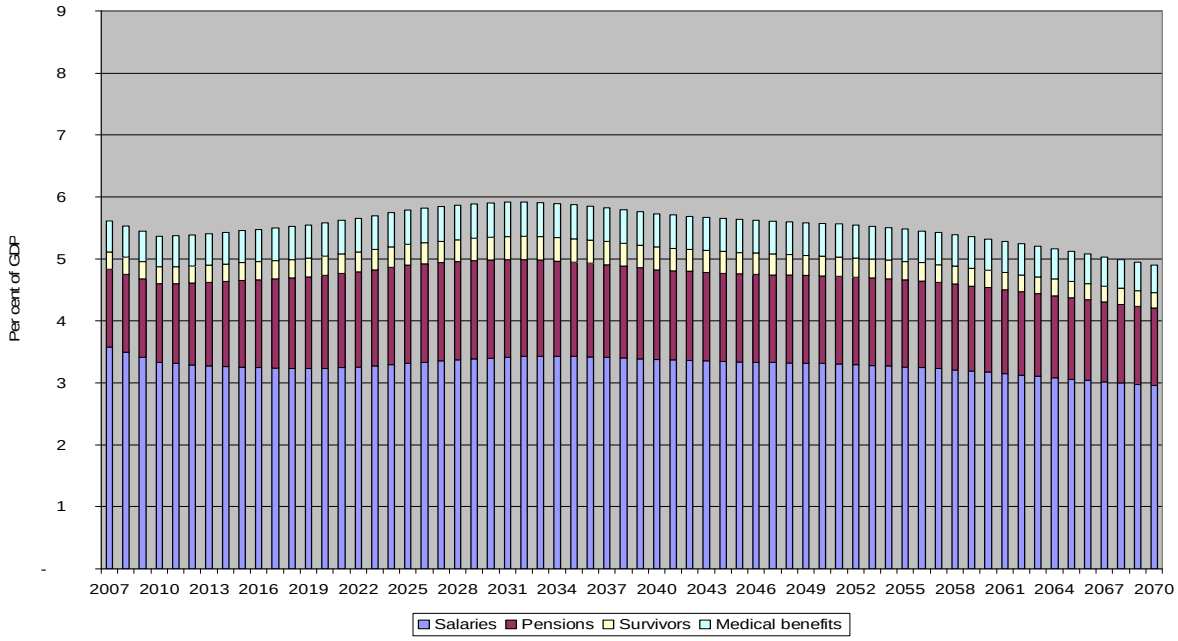
Source: Deutschlandmodell [*Result Sheets.xls, WagesPensCSMBS(BS)].*

Figure 50b. Civil service: cost of total remuneration package in per cent of GDP – pessimistic scenario



Source: Deutschlandmodell [*Result Sheets.xls, WagesPensCSMBS(1)].*

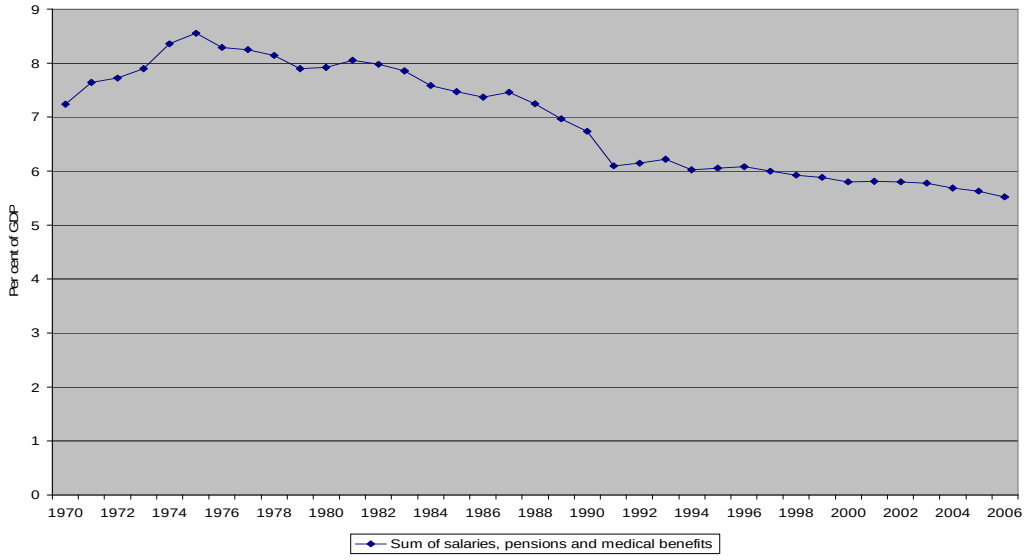
Figure 50c. Civil service: cost of total remuneration package in per cent of GDP – optimistic scenario



Source: Deutschlandmodell *[Result Sheets.xls, WagesPensCSMBS(2)].*

A comparison with historical developments shows that the expected GDP shares of the civil servants' total remuneration package will in all three scenarios be well below the levels of the 1970s and 1980s when it was permanently above 7 per cent of GDP and over a few years peaked even at above 8 per cent (figure 50d; information relates to West Germany). [88]

Figure 50d. Civil service: cost of total remuneration package in per cent of GDP, 1970 to 2006



Source: Deutschlandmodell [*CivServRemunPackage.xls, Chart1*].

[88] Respective information was kindly provided by the German government (BMAS, BMG, StBA).

3.8. Total social budget: revenue and balance

(Table annex: Tables 4a to 4f)

Total revenue of the social budget consists of eight different categories: employer and employee contributions, imputed contributions, contributions by self-employed, by beneficiaries and by other insured persons; public transfers; and other revenue (e.g., returns on reserves).

The calculation of contributions is a straightforward result of the calculated / assumed number of contributors, their income and the applied contribution rates.

Public transfers consist mainly of the following flows of funds:

- federal government subsidy to the social pension insurance;
- federal government subsidy to the social health insurance;
- federal government deficit coverage of the unemployment insurance;
- public monies used to finance ALG2 and social assistance,
- family benefits including (indirect) tax benefits.

Where an explicit «tangible» rule exists (like in the cases of SPI, SHI and UI) these transfers were calculated accordingly; in the other relevant cases public transfers are identical with expenditure and, thus, identical with projected benefit expenditure developments.

The results for the sum of all public transfers to the social budget are reflected in figure 51. Basically, transfers under the pessimistic scenario remain constant in per cent of GDP, they increase strongest in the optimistic scenario, and only slightly under the baseline. Under all scenarios, however, public transfers remain within the relative limits as observed in the past.

Figure 51. Public transfers in per cent of GDP – three scenarios

Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart9(2)]*.

Other revenue is partially calculated residually, partially it reflects capital income (returns on reserves).

It is worth noting that in the past Germany's social budget expenditure has always been covered by sufficient revenue, rendering a continuous annual sequence of surpluses. This is expression of the fact that German policy always took the issue serious of balancing revenue and expenses of the overall social finance system.

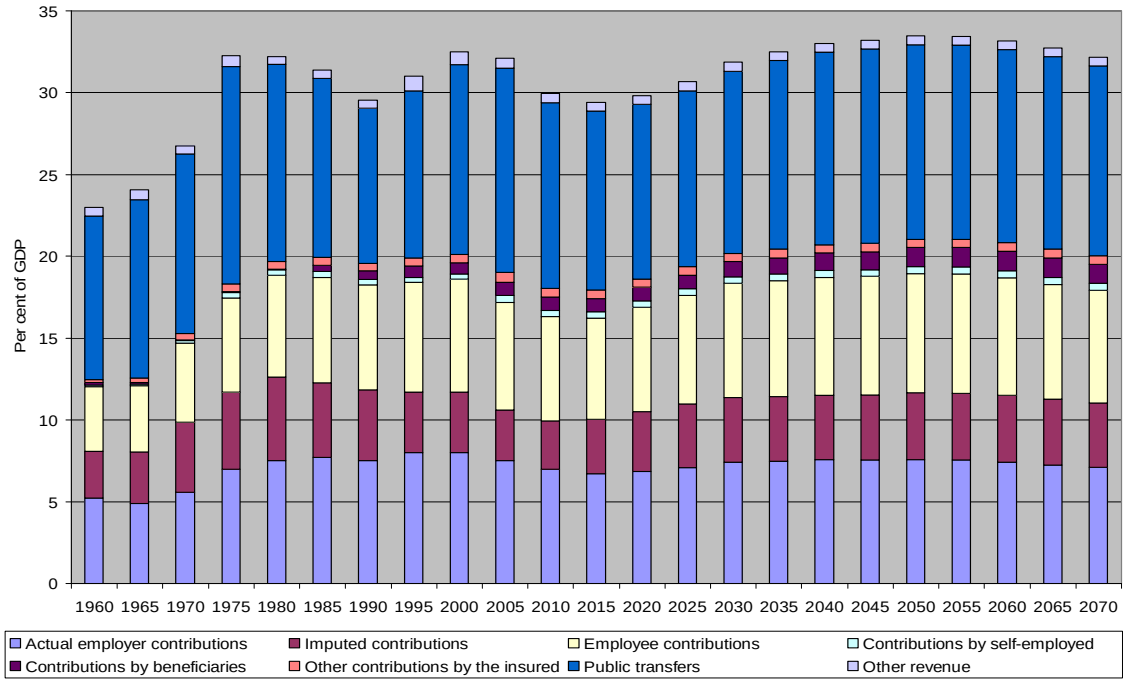
Our projection approach, by methodology, «guarantees» that Germany's social budget has also in future sufficient resources available to cover its expenses. In other words, future revenue was calculated such that expenses are always being covered. As a result, the model calculates the future contribution rates, and state subsidies, required in order to cover the (growing) expenses. The approach also guarantees that the model calculates decreases of contribution rates whenever expenditure development allows for it instead of, alternatively, calculating surpluses or improvements in benefit entitlements. An alternative approach would have been, to keep contribution rates invariable (= constant) and relative public transfers unchanged (for example as a constant share to a suitably chosen reference variable, e.g. GDP); in this case the model would have shown the deficits (surpluses) emerging due to ageing and / or economic and / or migration assumptions.

As a result, the social budget *revenue* ratio is continuously between around 0.5 and 1.5 percentage points higher than the social budget *expenditure* ratio; towards the end of the projection period the difference increases slightly, which is partially a result of the financial mechanism guaranteeing the sustainability reserve in the order of 0.5 monthly pension expenses.

Thus, in order to understand the development over time of the total social budget revenue ratio we refer to the explanations made with respect to the social budget expenditure ratio (see above).

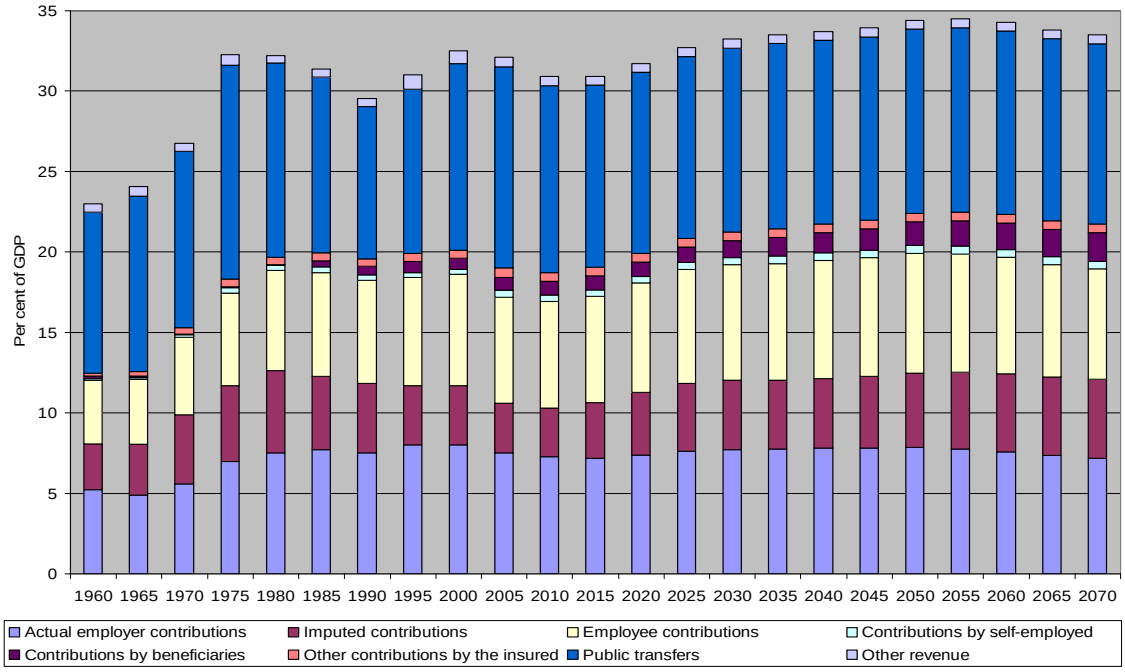
The income structure of Germany's social budget clearly reflects it's tripartite financing philosophy. Indeed, the budget was financed, in the past, by around 1/3 contributions paid by the insured, 1/3 paid by the employers and 1/3 paid by the state. Over recent years the employers' share declined slightly, while the insureds' share remained stable and the state's share increased. In broad terms, the results under all scenarios imply future continuation of this revenue structure (status-quo legislation; Figures 52a to 52c).

Figure 52a. Social budget revenue ratio by components, 1960 to 2070 – baseline



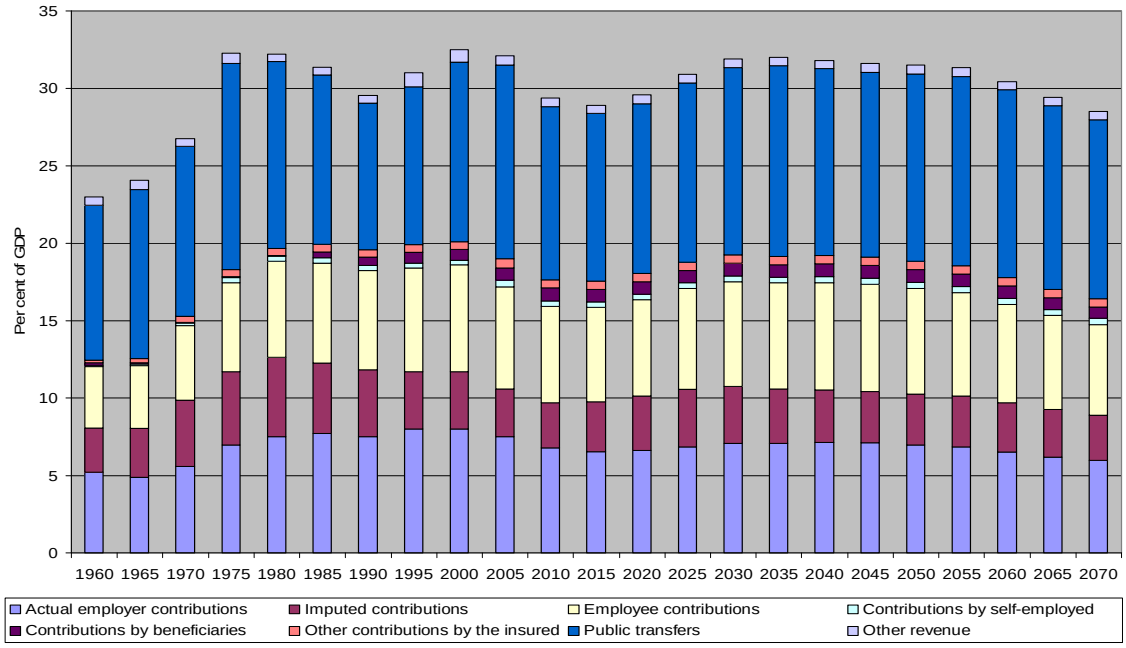
Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart6(2)*].

Figure 52b. Social budget revenue ratio by components, 1960 to 2070 – pessimistic scenario



Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart7(2)].*

Figure 52c. Social budget revenue ratio by components, 1960 to 2070 – optimistic scenario



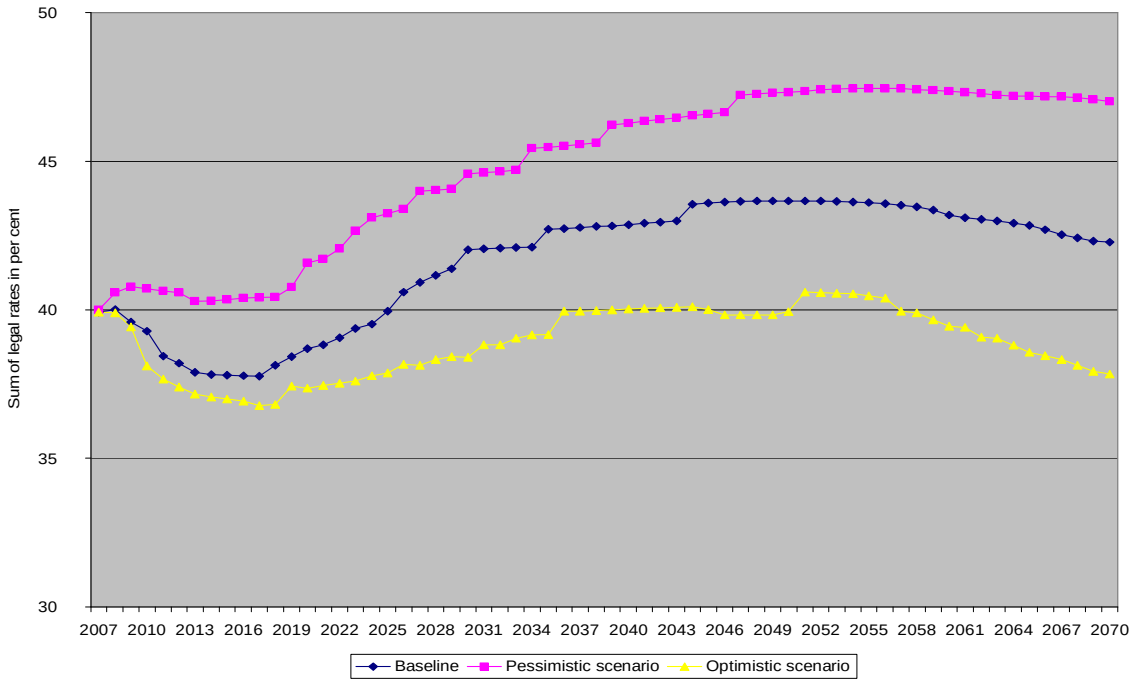
Source: Deutschlandmodell [*Tabellenanhang Sozialbudget.xls, Chart8(2)*].

Contribution rates

The total contribution rate consists of the sum of the legal rates for SPI, SHI, LTCI and UI. Under our calculations the sum of these rates («Gesamtbeitragssatz») develops as reflected in figure 53, below. Until the end of the next decade, there is in all scenarios a potential for declining contribution rates; with the beginning of the 2020s, latest, a strong tendency towards higher legal rates emerges; all scenarios have a tendency of rates peaking in the late 2040s and 2050s, followed by a decline, later: in the *baseline*, the contribution rate peaks in 2049 at 43.7 per cent of contributive wages; in the *pessimistic scenario* in 2056 at 47.5 per cent and in the *optimistic scenario* in 2051 at 40.6 per cent. [89]

[89] The step-wise fluctuation of the rates as shown in figure 53 must not be over-interpreted; they are solely technical model reactions to changes in exogenous assumptions.

Figure 53. Sum of legal contribution rates – three scenarios



Source: Deutschlandmodell [*Tabellenanhang Economy Part 2 new.xls, Chart1*].

By the end of the projection period the total contribution rate will be at levels of 42 per cent in the baseline, of 47 per cent in the pessimistic and of 38 per cent in the optimistic scenario.

We re-iterate that the above rates appear significantly less dramatic when actual contributions are calculated in per cent of GDP (table 3 / Uebersicht 3).

4. Social budget allocation by age groups

An attempt was made within the research project to allocate the expenditure of Germany's social budget on the age groups of the population, i.e. on the groups aged 0 to 19 (representing «children and youth»), aged 20 to 64 (representing the «actives»), and aged 65+ (representing the retired «old population»).

For this purpose we investigated the «demographic nature» of each function of the social budget. We then allocated each single programme within a given function to one of the above three age groups. This approach tries to answer the question «To which demographic group must benefits be allocated, taking into account given legislation?»; it does not answer the incidence question, i.e. «In whose pockets do social benefits actually end up?». We are also aware, that there are many overlaps in benefit receipt between the age groups as defined above. For example, it is noted that persons receiving old-age and survivor benefits are not all aged 65+, and persons receiving family benefits may actually be older than 19 years. On the other hand, our calculations with respect to age-allocation of total expenses under the function health were based on single-age utilization rates and, thus, empirically detailed and significant with respect to the defined age groups.

Taking these considerations into account we still believe that the statistical results of the chosen indicator (= social budget allocated to age-group *in per cent of GDP* – see below) would not change much in case more sophisticated statistical research had been applied.

Table 9 summarizes the results for the baseline scenario.

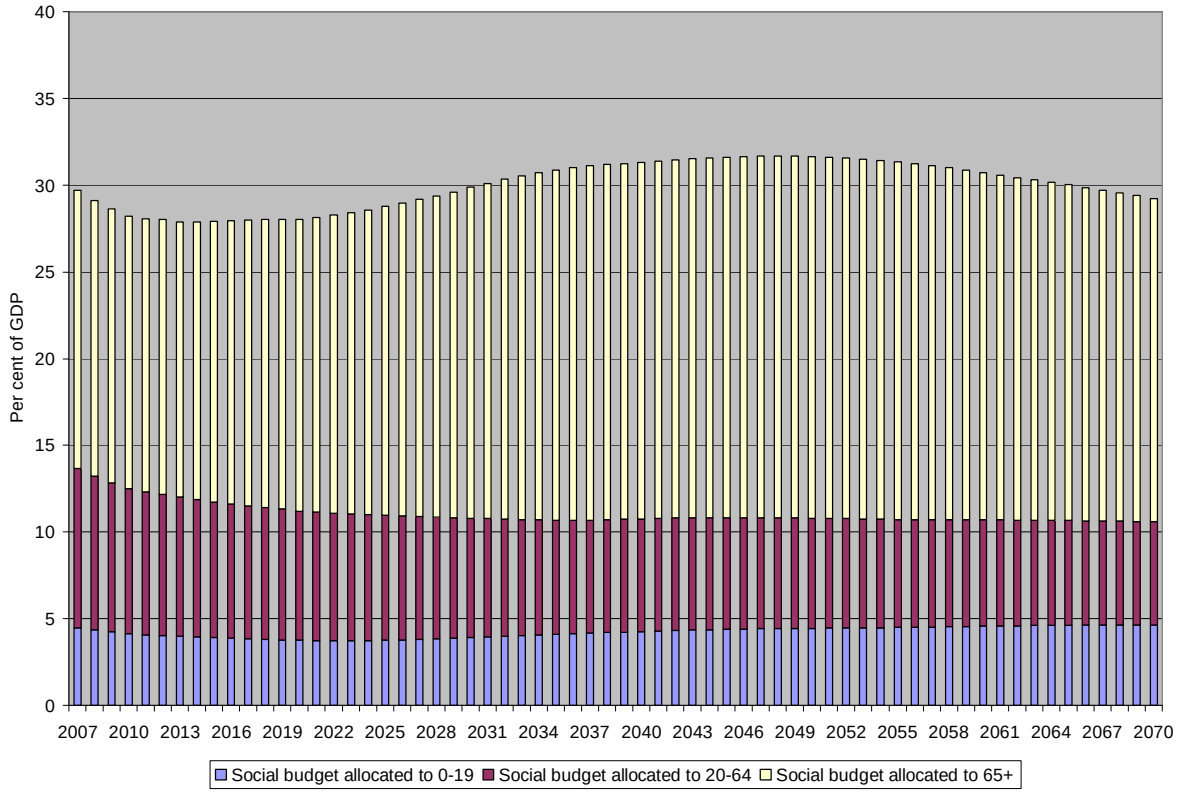
Table 9. Allocation of Germany's social budget to age-groups – baseline

Function of social budget	Per cent of GDP						
	2010	2020	2030	2040	2050	2060	2070
Family	3.9	3.6	3.8	4.3	4.5	4.7	4.8
Age group 0-19	2.8	2.5	2.7	3.0	3.1	3.3	3.3
Age group 20-64	1.2	1.1	1.1	1.3	1.3	1.4	1.4
Age group 65+							
Health	10.5	10.5	10.9	11.0	11.0	10.4	9.6
Age group 0-19	1.1	0.9	0.9	0.9	0.9	0.9	0.9
Age group 20-64	4.9	4.6	4.1	3.7	3.6	3.4	3.3
Age group 65+	4.6	4.9	5.9	6.4	6.5	6.0	5.4
Employment	1.4	1.1	1.0	0.9	0.8	0.7	0.6
Age group 0-19							
Age group 20-64	1.4	1.1	1.0	0.9	0.8	0.7	0.6
Age group 65+							
Old age and survivors	11.3	12.1	13.4	14.3	14.5	14.2	13.4
Age group 0-19	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 20-64	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 65+	10.9	11.7	13.0	13.9	14.1	13.7	13.0
Political events	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64							
Age group 65+	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Housing	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Age group 0-19	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 20-64	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Age group 65+	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Promotion of savings	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 65+							
General social aid	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 0-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Age group 20-64	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 65+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total allocation of SB on	**Per cent of GDP**						
Age group 0-19	4.0	3.6	3.7	4.0	4.2	4.3	4.4
Age group 20-64	8.2	7.3	6.7	6.3	6.1	5.9	5.8
Age group 65+	16.1	17.2	19.5	21.0	21.3	20.5	19.0
All age groups	28.2	28.0	29.9	31.3	31.6	30.7	29.2
Total allocation of SB on	**Per cent of total social budget**						
Age group 0-19	14.1	12.7	12.4	12.9	13.3	14.1	15.2
Age group 20-64	29.0	25.9	22.4	20.1	19.4	19.3	19.7
Age group 65+	56.9	61.4	65.2	67.0	67.3	66.6	65.2
All age groups	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Share of age groups in population	**Per cent of total population**						
Age group 0-19 as proportion of total population	18.6	16.9	16.8	17.6	18.1	18.9	19.9
Age group 20-64 as proportion of total population	60.9	60.1	54.8	50.7	49.6	49.5	50.3
Age group 65+ as proportion of total population	20.5	23.0	28.4	31.7	32.3	31.5	29.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Deutschlandmodell.

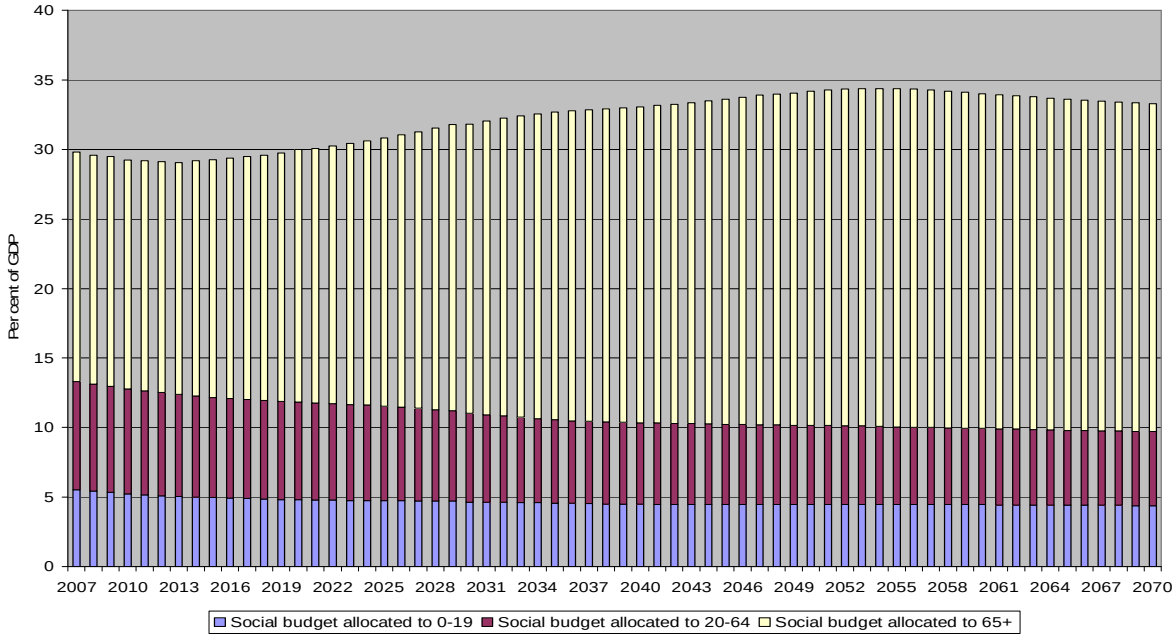
The sequence of figures 54a to 54c reflects the age allocation of the social budget under the three scenarios.

Figure 54a. Allocation of the social budget to population by age groups – baseline



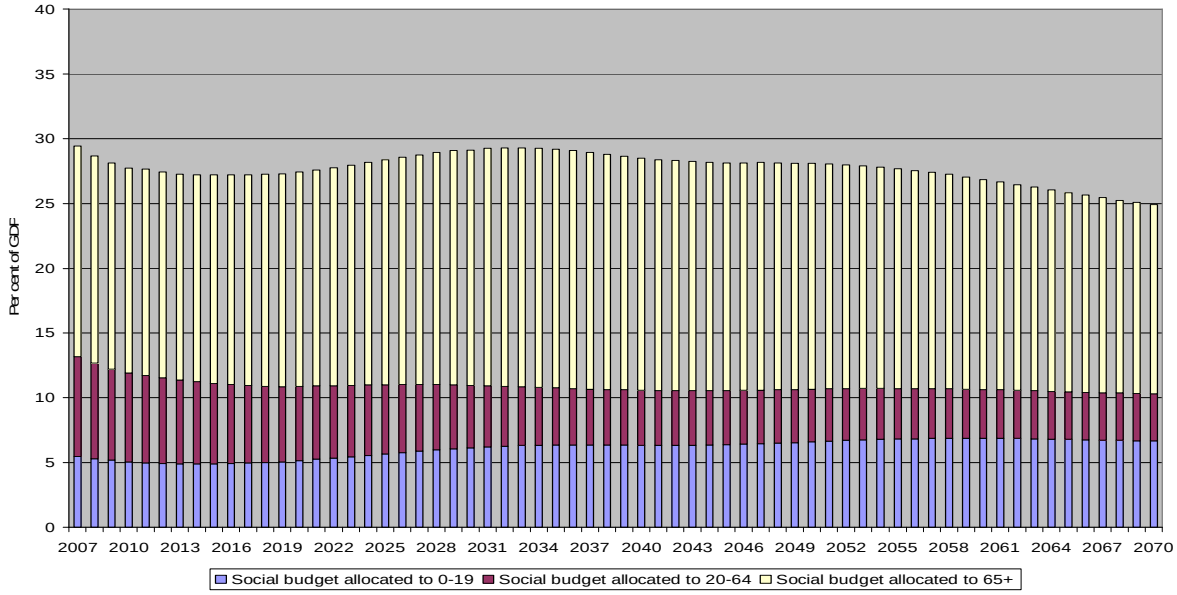
Source: Deutschlandmodell [*Blueprints 2_3.xls, SB Age Alloc Chart BS*].

Figure 54b. Allocation of the social budget to population by age groups – pessimistic scenario



Source: Deutschlandmodell *[Blueprints 2_3.xls, SB Age Alloc Chart 1*].

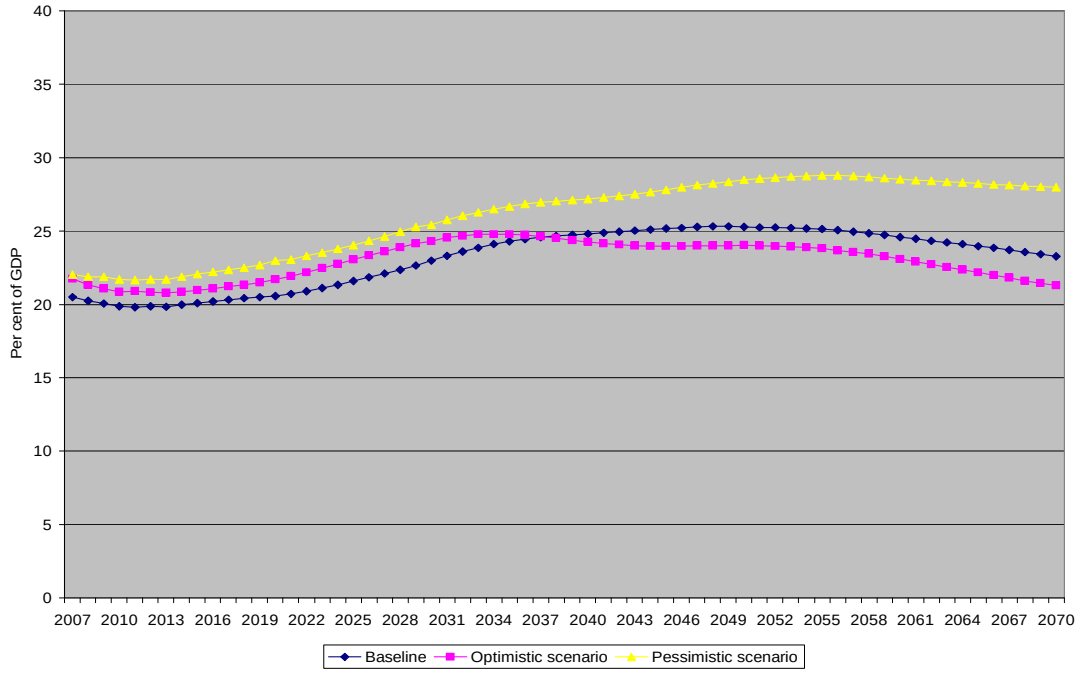
Figure 54c. Allocation of the social budget to population by age groups – optimistic scenario



Source: Deutschlandmodell *[Blueprints 2_3.xls, SB Age Alloc Chart 2*].

In assuming that it is the persons in the age group 20 to 64 who produce the GDP out of which all social expenses are being paid then one can calculate that group's net burden of social costs by deducting from the total social expenditure ratio in per cent of GDP the amount (in per cent of GDP) which flows directly back to the «active» age group (i.e. of those aged 20 to 64). (Figure 55)

Figure 55. Net financial burden of the population in age group 20 to 64 – three scenarios



Source: Deutschlandmodell [*Blueprints 2_3.xls, SB Net Burden*].

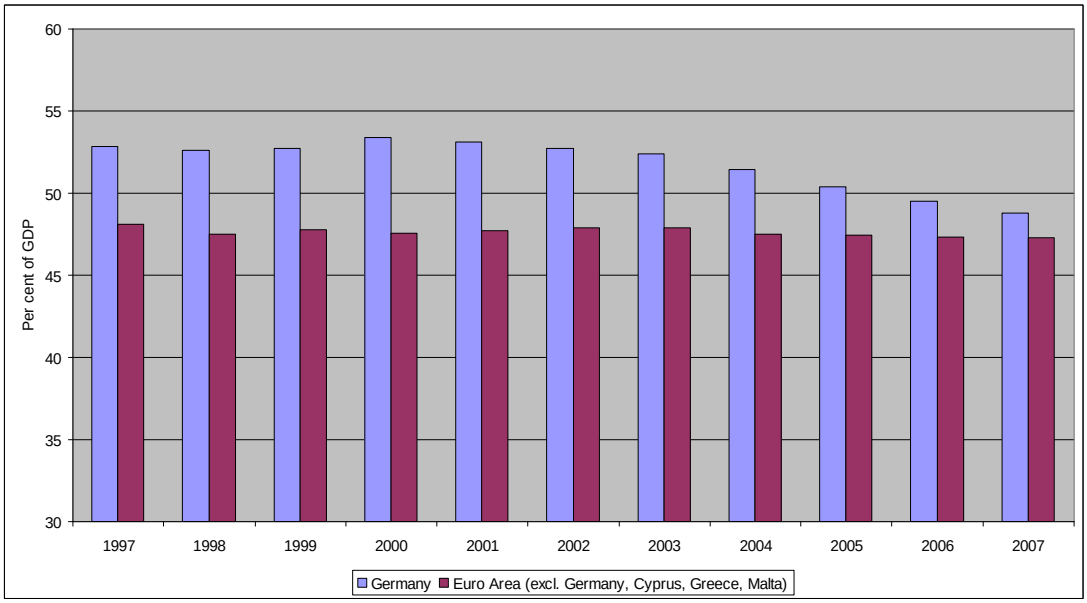
The difference between the numbers presented in figure 1 and the above figure 55 is substantial; it represents the maximum savings within the social budget that could potentially materialize *through a policy that would aim at focusing social spending solely on the young and the older age groups* of the society while minimizing social spending on the actives. Such policy would materialize, for example, through full employment (which – potentially – implies reduction to zero of unemployment expenses under the function employment).

5. Economic implications

Our calculations have impacts, through the projected changes of the legal contribution rates, on labour income (compensation of employees) and on employee net wages.

In a tripartite move towards adjusting to the challenges of globalization and requirements of labour market flexibilization Germany's labour income share in GDP has since 2000 declined meanwhile to below 49% and is, thus, in line with the weighted average of the other countries in the Euro Area, i.e. with Austria, Belgium, Finland, France, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovenia and Spain (figure 56).

Figure 56. Germany and Euro Area: labour income share in GDP 1997 to 2007



Source: Deutschlandmodell [*Labour share charts and tables.xls, Chart1*].

According to our calculations we expect the labour income share

- In the baseline, to remain below its 2006-level until the end of the next decade (around 2020), and only then, driven by the legal social security contribution rates, surpass its 2006-level by around 1 percentage point;
- In the optimistic scenario, to remain in almost all projection years below the 2006-level, and
- In the pessimistic scenario, to remain below its 2006-level until the middle of the next decade (2010s), and then start to surpass that level in the longer run by between 1.5 and 2 percentage points.

It is, therefore, not to be expected, on basis of our calculations, that Germany would lose its competitive position on the international markets *because* of increasing future labour costs as a result of increasing employer contributions.

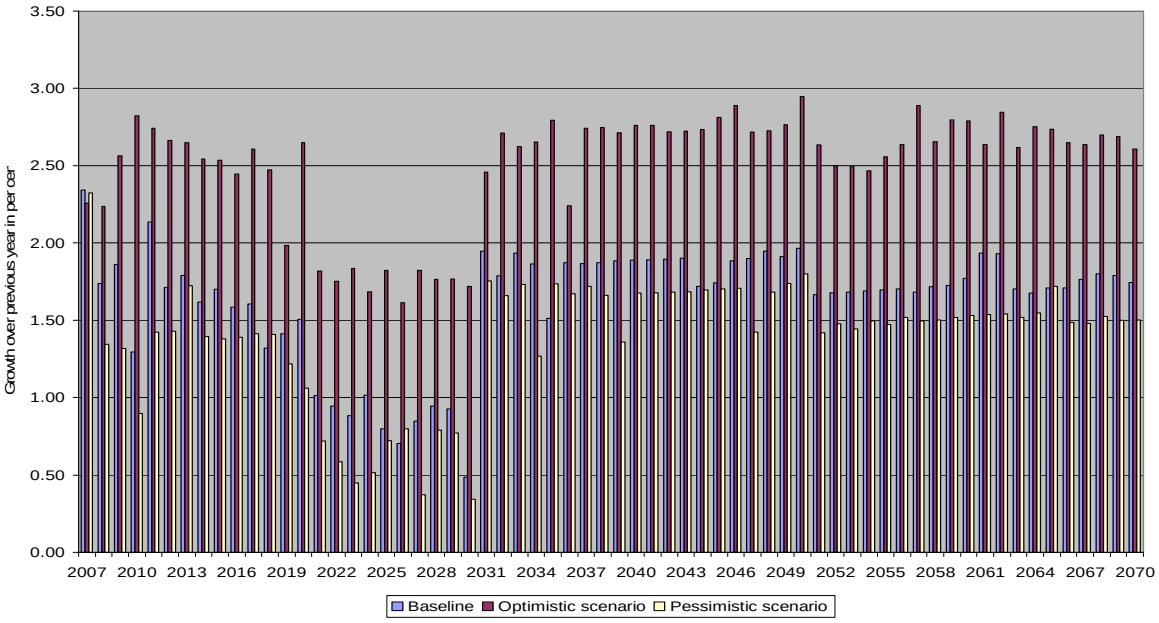
Unit labour costs

The impact of the future increases of contribution rates on labour unit costs (=compensation per employee divided by real GDP per employed) is almost negligible. In comparison to a hypothetical scenario, where employer contribution rates remain constant in per cent of average wages, labour unit costs develop only marginally faster. In all scenarios, their annual dynamics is only between 0.1 to 0.3 percentage points higher than in the hypothetical scenario; in most of the projection years differentials are almost not measurable, i.e. close to zero.

Net wages and net real wages

For our calculations on future net wage development we assumed a constant average wage tax rate.[90] On this basis, the contribution rate developments have slightly decreasing effects on the annual growth rates of net wages, which mirrors the (similar) magnitude of impact on labour-unit-costs (above). Under the assumption of stability oriented monetary policy of the ECB, and assuming (nominal) productivity oriented wage policies, the German dependent workforce can also in future, under current social legislation unchanged, expect growing real net wages. (figure 57):

Figure 57. Net real wage growth – three scenarios



Source: Deutschlandmodell [*Blueprints.xls, NetRealWage*].

Figure 57 highlights the fact, however, that the period until the end of the 2020s is critical with respect to net wage development. This period is to be understood, according to our calculations, as a phase of unavoidable increases of contribution rates in which positive real net wage development will be at risk. Especially in the pessimistic scenario, and in case the SHI makes use of the option to collect additional contributions from the employees (the employers remaining unaffected), the possibility of no or even negative real net wage increases might temporarily occur (as it did in the past).

[90] The average wage tax rate is currently about 17.5 per cent of gross wages.

Caveat

All results on labour costs and on net wages are valid only, of course, if employers and trade unions revert to a (nominal) productivity oriented wage policy as assumed in our calculations; if not, i.e. if both sides continue their policies as observed over the past two decades, then labour cost development will be even more moderate, while average net wage development will (at best) continue stagnating. With a further declining labour income share, however, each additional percentage point of social security contributions will be felt even more by employers and employees alike, in terms of their respective cost and income positions as well as with respect to expectation building. This risk can only be counterbalanced by wage policies that are clearly devoted to accepting nominal labour productivity progress as the core benchmark for future wage increases.

The social budget as part of the employees' remuneration package

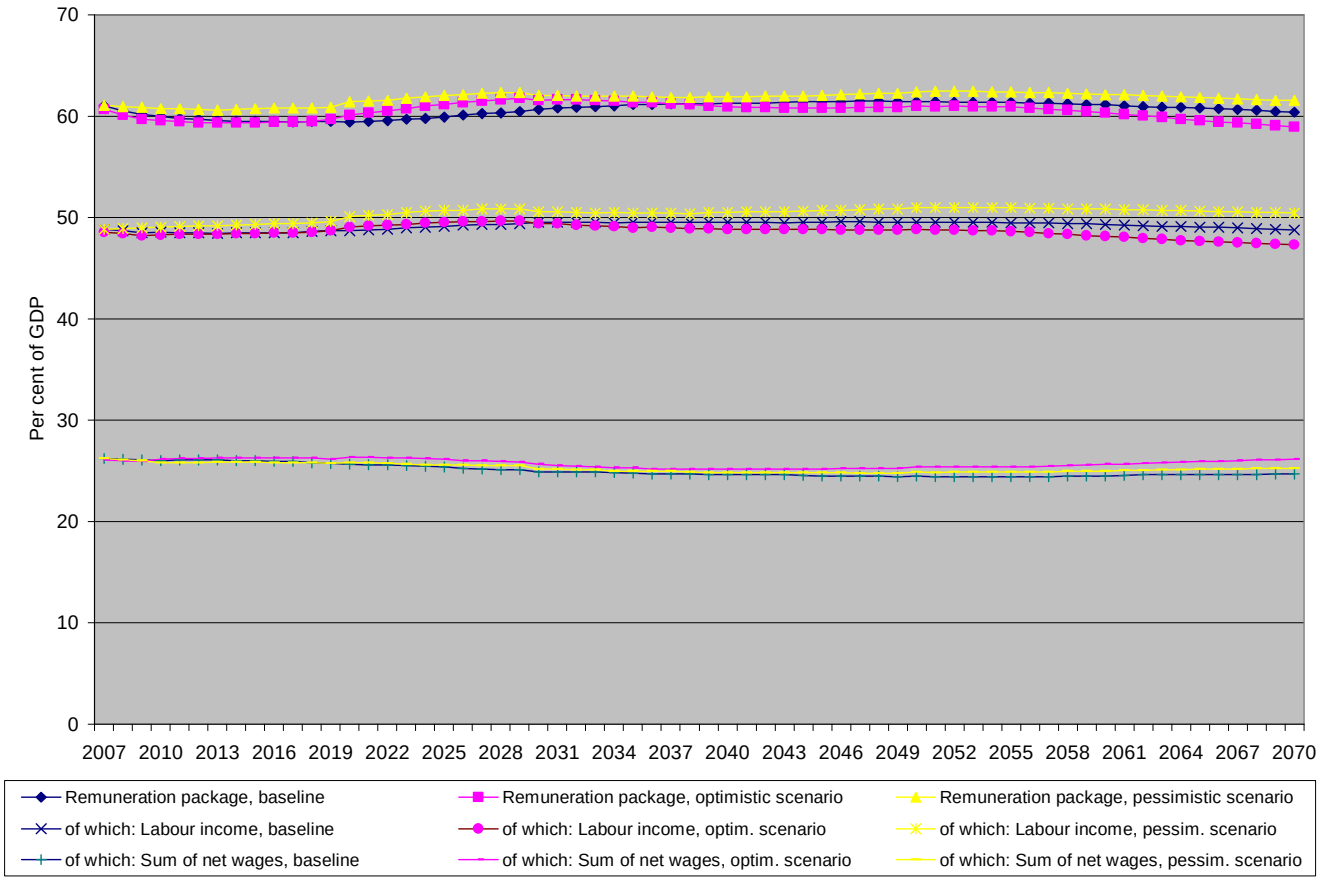
As in the case of civil servants it is possible to interpret, macro-economically, the social budget as part of the overall remuneration package which "Germany" offers to its employees (and their families, including their children and their parents).[91] The remuneration package can tentatively be defined as the sum of the compensation of employees plus the tax-financed part of the social budget. We add only the tax financed part to employees' compensation as the contribution-financed part of the social budget has already been financed out of employer and employee contributions (which are part of employee compensation).[92]

Currently, the remuneration package is about 62 per cent of GDP. According to our calculations, in all three scenarios, this level will not vary much over the projection period and, in fact, remain more or less at present levels (figure 58).

[91] See also section 3.7.

[92] With this approach we allow for some methodological fault as we disregard the contributions by the self-employed, the beneficiaries and the other persons; also, we don't account for other revenue. All these revenue are, however, comparatively small (Figures 52a to 52c). Also, we are aware that workers bear substantial parts of the tax financed part of the social budget. In other words, the indicator is not supposed to measure distribution of income between «labour and capital»; only its development over time is here considered of analytical interest.

Figure 58. Remuneration package of employees, share in GDP – three scenarios



Source: Deutschlandmodell [Blueprints.xls, RemunerationPackage].

6. Conclusions

Under three sets of long-term demographic and economic assumptions this report focuses on the relative share in GDP, to be expected in future, of the flows of funds of the expenditure of Germany's social budget; simultaneously, the report shows how these expenses will be financed. All calculations have been based on status-quo social and labour market legislation; a number of explicit hypotheses were introduced with respect to the future cost drivers of health expenditure.

On the basis of the results of our calculations the following conclusions can be drawn:

1) There seems to be no general expenditure problem of the German social budget evolving in future. Under all scenarios the social expenditure ratio lies within a bandwidth of developments that has been observed in the past, or only slightly above. This equally implies that also in future:

   - the public social protection institutions will redistribute significant amounts of primary incomes (GDP) for social purposes; *and*
   - the German economy will not be overburdened by the respective costs.

   Therefore, on the basis of given legislation, we don't see reason for further general benefit cuts [93] in the near or more distant future.

2) Future level development of the social expenditure ratio correlates negatively with the set scenario assumptions: on average, [94] the ratio is 4.5 percentage points higher in the pessimistic scenario than in the optimistic; and 2.3 points higher than in the baseline. In other words, the German social welfare state is «forced to be more social» (in terms of redistribution of primary incomes) the lower

   - net migration;
   - fertility rates, and
   - labour productivity per hour worked.

   Therefore, in order to maintain and improve the financial basis for Germany's social protection system, measures are considered helpful that further improve the conditions for immigration (fostering integration), for families (fostering the situation of families, especially with young children and adolescents), and which contribute to maintaining and improving the qualifications (knowledge, skills) of the labour force.

3) The future revenue structure of the social budget confirms continuation of the traditional tripartite financing structure of the German welfare state. In other words, the stipulations / decisions with respect to

   - linking the government transfers to pension expenditure of the social pension insurance (SPI),

[93] This implies that we do not exclude relative spending shifts between the functions of the social budget.

[94] Arithmetic average over all projection years.

- introducing and increasing the government subsidy to the social health insurance (SHI), and

- channelling monies towards provision of additional kindergarten places,

including our modelling assumption that

- additional public transfers to SPI (deficit coverage) will be required after fixing the statutory contribution rate at a maximum level of 22 per cent,

only counterbalance relative reductions in public transfers to be expected in other programmes [95] and do not trigger structural changes in the general financial architecture of Germany's social budget.

Therefore, steps should be considered that aim at further widening the tax financed share of Germany's social budget.

4) By around 2050, the sum of statutory contribution rates reaches a maximum of slightly above 47 per cent in the pessimistic scenario, and of slightly below 44 per cent in the baseline, both declining later; in the optimistic scenario the sum remains in almost all projection years below 40 per cent. We consider these developments economically insignificant in that they

   - only marginally affect the development of labour unit costs over time, and, at the same time

   - allow for net real wage increases,

   as long as income (wage) policy is based on (nationwide) nominal labour productivity development. [96] The share in GDP of actual contributions paid remains at low levels over the projection period.

   However, within each of the scenarios, the logic of our calculations implies deterioration of the results concerning contribution rates in case

   - the demographic assumptions with respect to migration and fertility were not met (lower fertility, less immigration),

   - labour market developments would show, contrary to our assumption, further weakening of formal contributory work places in favour of precarious jobs, and / or

   - employer associations and trade unions would not succeed in agreeing on productivity oriented wage policies as indicated.

   Therefore, we suggest considering structural measures that not only allow for stabilisation of present contribution rates but for their reduction.

[95] Unemployment, family (children, youth, spouses), housing, political events, promotion of savings, general poverty relief.

[96] In case a national minimum wage were introduced this assumption would imply annual (regular) adjustment of minimum wages in line with national nominal labour productivity increases.

5) Of course, things can go better; however, on the basis of available information, we consider the optimistic scenario the «maximum envelope» that can under regular conditions reasonably be expected. Developments along the baseline or pessimistic scenarios appear to be more realistic. If one agrees with this assessment then, most probably, future increases of present statutory contribution rates can only be avoided by way of a radical reform of the revenue design of Germany's social budget. Comparative-static calculations undertaken *on the basis of our model results* show that, if the financial basis for contribution collection were broadened, a reduction of the maximum sum of statutory contribution rates to slightly above 30 per cent of national income should be possible – hereby, it is understood that about 1/3 of total social expenses would continue to be financed out of taxation. Broadening the financial basis implies abolishment of all contribution assessment ceilings and systematic inclusion of enterprises' profits and other non-labour primary incomes into contributive social protection financing.[97] Strictly speaking, such re-design of the financial basis of Germany's social budget would reduce contribution rate levels only if the additionally included incomes would not acquire additional benefit entitlements. The same measure would substantially contribute to reducing the over-proportional financial burden of those strata of labour with income levels below the present contribution assessment ceilings.

   Therefore, in order to enlarge the financial basis of Germany's social protection system, the introduction of statutory contributions at substantially reduced levels but levied on a broader range of primary incomes could be considered.

6) On the basis of our calculations we do not consider the German economy to be unduly burdened by financing the future modest increases in the overall social expenditure ratio.

   To the contrary, there may be limited space for programme improvements. Such improvements should be based on the suggested reforms of the social budget's financial basis, and ideally be phased in after their implementation.

   Areas of possible benefit improvements could be:

   - *Old-age benefits:* Our calculations confirm well-known long-term trends of declining income replacement rates under the social pension insurance (SPI) and of the civil service pension scheme; in order to counterbalance this development, and to make sure Germany also in future complies with its obligations out of ILO Conventions Nos. 102[98] and 128,[99] it is suggested to replace the present pension formula under SPI with a formula (i) guaranteeing a substantial flat component above minimum (social) income levels and (ii) limiting benefits in line with a benefit assessment ceiling; we would not suggest changes in policies aiming at concentrating benefits on certain age groups of the population groups

[97] Earlier we have pointed out the methodological limitations and preliminary character of our calculations; in any case, the implementation of such a policy could only be achieved under broad societal agreement and would, thus, require close cooperation with employer associations and trade unions, at the least.

[98] Convention No. 102 stipulates a standard retirement age of 65, and a standard income replacement rate for pensions of 40 per cent after 30 years of contributions paid.
http://www.ilo.org/ilolex/english/convdisp1.htm

[99] Convention No. 128 stipulates a standard income replacement rate for pensions of 45 per cent after 30 years of contributions paid. http://www.ilo.org/ilolex/english/convdisp1.htm

as legislated under SPI and the civil service pension scheme but suggest that «the [retirement] age shall be lowered, under prescribed conditions, in respect of persons who have been engaged in occupations that are deemed by national legislation, for the purpose of old-age benefit, to be arduous or unhealthy»;[100] realization of a revised formula, and flexibilisation for certain occupational groups of retirement ages, is most probably not achievable on a cost-neutral basis and would, *ceteris paribus*, induce increases in the social expenditure ratio;

- *Employment:* On the basis of probably increasing future labour market volatilities,[101] the *flexicurity* concept of the European employment strategy (trading increased flexibility of the labour force for high income security during spells where no labour income is being earned) can reasonably only be implemented at income replacement levels higher than the present ones (e.g., under ALG1); also, the concept requires substantial active labour market policies. In other words, the implementation of such a policy would enhance labour flexibility at the price of an increased social expenditure ratio. If successful, this increase could partially be financed by resulting increased contributory employment.

7) The results of our calculations contradict, with good reasons, widely accepted notions about (too) high increases of future health costs as a result of ageing. In this respect our findings are in compliance with the ongoing scientific discussion about possible health cost implications of increasing longevity. In applying the «healthy ageing» hypothesis we take a middle position in the range of available quantifiable hypotheses.

With respect to implications of overall health expenditure development on the financial development of the SHI (purchasing only part of overall health provisions), our results more specifically reflect certain characteristics of the SHI-covered population, age-dependent pricing of prescribed drugs and others; all aspects taken together have cost dampening effects on future spending of the SHI. Nevertheless, the SHI contribution rate shows a steady tendency of increase despite the fact that health purchases will be co-financed by a growing share of public transfers.

We consider measures counterbalancing contribution rate increases under SHI specifically urgent and, therefore, widening SHI's financial basis is of highest importance when compared to possible similar steps in the other institutions (SPI, UI); the stipulated growing public transfer is a useful first step but obviously not sufficient to achieve the goal of contribution rate stabilization in the longer run.

At the same time, we suggest to make effective use of, and further develop, the *health fund* (implemented as of January 2009), aiming at a rational unified health system overcoming the split between public and private purchasers, while optimizing the possibilities of simultaneously *controlling costs* and *improving the quality of the health system* and *guaranteeing peoples' equitable access to health services*.

[100] Convention 128, Article 15 (3). http://www.ilo.org/ilolex/english/convdisp1.htm

[101] Conceptually, these volatilities must be understood as adding to the insecurities in setting model assumptions with respect to future labour market structures, i.e. its categorization by self-employed, civil servants, contributors, other – including precarious – employment, and the unemployed.

7. Schlussfolgerungen

Dieser Bericht beschreibt, unter Bezugnahme auf drei alternative demographische und makro-ökonomische Szenarien, die erwartete langfristige Entwicklung der Einnahmen und Ausgaben des deutschen Sozialbudgets im Verhältnis zum Bruttoinlandsprodukt. Dabei wurden alle Berechnungen unter Annahme unveränderten Arbeits- und Sozialrechts durchgeführt; eine Reihe von Hypothesen wurde für Zwecke der Berechnung der Gesundheitsausgaben und ihrer Finanzierung eingeführt.

Die Resultate erlauben die folgenden Schlussforlgerungen:

1) Auf lange Frist dürfte das deutsche Sozialbudget kein generelles Ausgabenproblem haben. In allen Szenarien liegt die Sozialleistungsquote innerhalb einer Bandbreite von Werten, die in der Vergangenheit bereits erreicht wurden, oder temporär nur wenig darüber. Dieses Ergebnis impliziert, dass auch in der Zukunft

   - die entsprechenden öffentlichen Institutionen erhebliche Beträge des gesamtwirtschaftlich erzeugten Primäreinkommens (BIP) für soziale Zwecke umverteilen warden; *und*

   - die deutsche Volkswirtschaft von den entsprechenden Kosten nicht überlastet wird.

   Aus diesen Gründen sehen wir auf der Basis gegebener Gesetzgebung weder kurz- noch längerfristig einen Anlass für weitere generelle Leistungskürzungen. [102]

2) Das generelle künftige Ausgabenniveau des Sozialbudgets korreliert negativ mit den vorgegebenen Szenarioannahmen: im Durchschnitt [103] ist die Sozialleistungsquote im pessimistischen Szenario 4.5 Prozentpunkte höher als im optimistischen und 2.3 Prozentpunkte höher als im Basisszenario. Mit anderen Worten, der deutsche Sozialstaat ist (im Sinne einer Einkommensumverteilung) «gezwungen» umso sozialer zu sein, je niedriger

   - die Netto-Migration,

   - die Geburtenraten, und

   - die Arbeitsproduktivität je Arbeitsstunde.

   Um die finanzielle Basis des deutschen Sozialsystems zu erhalten und zu verbessern, werden Massnahmen für sinnvoll erachtet, die die Bedingungen für Einwanderer (Integration) und für Familien (insbesondere solche mit Kindern) verbessern sowie zur Beibehaltung und Verbesserung der Qualifikation (Wissen, Kenntnisse) der Erwerbspersonen beitragen.

3) Die zu erwartende künftige Struktur des Sozialbudgets bestätigt eine Fortsetzung der drittelparitätischen Finanzierung des deutschen Sozialstaats. Mit anderen Worten, die Regelungen und Entscheidungen mit Bezug auf

[102] Dies schliesst Leistungsniveauverschiebungen zwischen den einzelnen Funktionen des Sozialbudgets nicht aus.

[103] Arithmetisches Mittel über den Projektionszeitraum.

- die programmierte Anbindung öffentlicher Transfers zur gesetzlichen Rentenversicherung an systemimmanente Variablen,

- die Einführung und programmierte Erhöhung eines Bundeszuschusses zur gesetzlichen Krankenversicherung, und

- die Bereitstellung von Geldern für die Bereitstellung und den Betrieb zusätzlicher Kindergärten,

einschliesslich unserer Modellierungsannahme, dass

- der gesetzlichen Rentenversicherung zusätzliche öffentliche Mittel (zur Defizitdeckung) zur Verfügung gestellt werden, um eine Anhebung des gesetzlichen Beitragssatzes über 22 Prozent hinaus auszuschliessen,

werden relative Verminderungen öffentlicher Transfers, die in anderen Sozialprogrammen zu erwarten sind, lediglich ausgleichen [104] und insoweit keine nachhaltigen Veränderungen in der Finanzierungsstruktur des Sozialbudgets bewirken.

Aus diesem Grunde sollten Schritte zu einer weiteren Ausweitung des steuerfinanzierten Anteils des Sozialbudgets überlegt werden.

4) Etwa um das Jahr 2050 erreicht der gesetzliche Gesamtbeitragssatz im pessimistischen Szenario ein Maximum von etwas über 47 Prozent und einen von etwas unter 44 Prozent im Basisszenario; in beiden Fällen sinkt der Beitragssatz anschliessend; im optimistischen Szenario bleibt der Satz in fast allen Projektionsjahren unter 40 Prozent. Aus ökonomischer Sicht halten wir diese potentiellen Entwicklungen insoweit nicht für signifikant, als sie

   - die Lohnstückkostenentwicklung nur marginal beeinflussen, und gleichzeitig

   - durchaus Nettorealverdienstzuwächse erlauben,

   jedenfalls solange wie sich die Lohnpolitik von Gewerkschaften und Arbeitgebern an der inländischen nominalen Arbeitsproduktivität orientiert. [105] Der Anteil tatsächlich gezahlter Sozialbeiträge am Bruttoinlandsprodukt verharrt ebenfalls über die gesamte Projektionsperiode auf niedrigem Niveau.

   Innerhalb jedes der drei Szenarien ergeben sich hinsichtlich der Beitragssatzentwicklung allerdings Verschlechterungen für den Fall, dass

   - die demographischen Annahmen hinsichtlich Migration und Fertilität unterschritten werden;

   - die Arbeitsmarktentwicklung, abweichend von unseren Annahmen, eine weitere Reduktion von beitragspflichtigen Arbeitsplätzen ergäbe; und / oder

[104] Hiebei handelt es sich um potentielle öffentliche Zuschüsse in den Funktionen Arbeitslosigkeit, Familie (Kindergeld, Ehegattensplitting, u.a.m.), Wohngeld, Politische Ereignisse, Sparförderung, allgemeine Massnahmen zur Armutsbekämpfung.

[105] Falls ein bundesweiter Mindestlohn eingeführt würde, müsste seine regelmässige Indexierung sich ebenfalls an der jährlichen Veränderung der Arbeitsproduktivität orientieren.

- die Tarifpartner erfolglos darin blieben, eine produktivitätsorientierte Lohnpolitik durchzusetzen.

Aus diesen Gründen empfehlen wir die Erwägung struktureller Massnahmen, die nicht nur eine Stabilisierung der gegenwärtigen Beitragssätze erlauben, sondern darüberhinaus auf ihre Reduzierung abzielen.

5) Selbstverständlich kann es besser kommen; auf der Basis verfügbarer Informationen betrachten wir jedoch das optimistische Szenario als Maximum dessen was ökonomisch unter regulären Bedingungen vernünftigerweise erwartet werden kann. Es ist daher wahrscheinlich, dass künftige Beitragssatzanhebungen nur als Resultat einer radikalen Reform der Finanzierungsseite des Sozialbudgets vermieden warden können. Komparativ-statische Berechnungen, die auf der Basis unserer Modellergebnisse durchgeführt wurden, zeigen, dass eine Verbreiterung der Beitragsbasis eine Verringerung des gesetzlichen Gesamtbeitragssatzes in seinem maximum auf etwas über 30 Prozent des Nationaleinkommens zuliesse – dabei wird vorausgesetzt, dass weiterhin etwa ein Drittel des Sozialbudgets aus öffentlichen Mitteln finanziert würde. Verbreiterung der Beitragsbasis impliziert Abschaffung aller Beitragsbemessungsgrenzen und systematische Einbeziehung aller Kapitaleinkünfte, einschliesslich Unternehmensgewinne.[106] In einem strikten Sinne würde eine solche Veränderung der Finanzierung des Sozialbudgets nur dann die berechneten Beitragssatzsenkungen erlauben, wenn die Einbeziehung der zusätzlichen Einkommen nicht zu zusätzlichen Leistungsansprüchen führen würde. Die Hauptnutzniesser einer solchen Massnahme wären diejenigen Arbeitnehmer, deren Löhne und Gehälter unterhalb der jetzigen Beitragsbemessungsgrenzen liegen.

   Aus diesen Gründen könnte die Absenkung der gesetzlichen Beitragssätze auf ein substanziell niedrigeres Niveau, bei gleichzeitiger Ausweitung der Finanzierungsbasis auf einen erweiterten Kreis von gesamtwirtschaftlichen Primäreinkommen, erwogen werden.

6) Auf der Grundlage unserer Berechnungen sehen wir nicht, dass die deutsche Volkswirtschaft durch die Finanzierung des moderaten unvermeidlichen Anstiegs der Sozialleistungsquote übermässig belastet würde.

   Im Gegenteil, es könnte durchaus Raum für begrenzte Leistungsverbesserungen bestehen. Im wesentlichen, und idealerweise, sollten solche Verbesserungen allerdings zunächst die vorgeschlagenen Reformen auf der Finanzierungsseite abwarten.

   Mögliche Leistungsverbesserungen könnten sodann sein:

   - *Alterssicherungsleistungen:* Unsere Berechnungen bestätigen bekannte langfristige Trends sinkender Rentenniveaus in der GRV und sinkender Pensionsniveaus in der Beamtenversorgung; um dieser Entwicklung gegenzusteuern, insbesondere auch um sicherzustellen, dass Deutschland auch künftig seine Verpflichtungen aus den IAO Uebereinkünften 102[107] und 128[108]

[106] Wir haben weiter oben auf die methodischen Grenzen und den vorläufigen Charakter unserer Berechnungen hingewiesen.

[107] Uebereinkunft 102 bestimmt ein Standardrentenalter von 65 Jahren, und ein Standardrentenniveau von 40 Prozent nach 30 Beitragsjahren.
http://www.ilo.org/ilolex/english/convdisp1.htm

[108] Uebereinkunft 128 bestimmt ein Standardrentenniveau von 45 Prozent nach 30 Beitragsjahren. http://www.ilo.org/ilolex/english/convdisp1.htm

erfüllt, wird vorgeschlagen, die gegenwärtige Rentenformel der GRV durch eine Formel zu ersetzen, die (i) eine substantielle Grundrente garantiert (oberhalb des sozialen Minimums) und (ii) die individuellen Renten, die von der GRV gezahlt werden, auf ein Maximum begrenzt (durch die Einführung etwa einer Leistungsbemessungsgrenze); wir empfehlen keine Aenderung von Massnahmen, die der Konzentration der Renten- und Pensionsleistungen auf bestimmte Altersgruppen dienen, wohl aber dass «the [retirement] age shall be lowered, under prescribed conditions, in respect of persons who have been engaged in occupations that are deemed by national legislation, for the purpose of old-age benefit, to be arduous or unhealthy»;[109] die Realisierung einer solchen revidierten Formel und Flexibilisierung des Rentenalters für bestimmte Berufsgruppen ist wahrscheinlich nicht ohne Mehrausgaben zu erreichen und würde daher *ceteris paribus* eine Erhöhung der Sozialleistungsquote induzieren;

- *Beschäftigung:* Vor dem Hintergrund künftig wahrscheinlich steigender Arbeitsmarktvolatilitäten ist das *flexicurity* Konzept der Europäischen Beschäftigungsstrategie (das hohe Einkommenssicherung der Arbeitnehmer im Gegenzug für deren erhöhte Arbeitsmarktflexibilität vorschlägt) vernünftigerweise nur zu höheren als gegenwärtig (etwa ALG1) bereitgestellten Leistungsniveaus implementierbar; auch erfordert das Konzept substantielle Anstrengungen einer aktiven Arbeitsmarktpolitik. Mit anderen Worten: die Realisierung einer flexicurity Strategie würde (nur) zum Preis einer erhöhten Sozialleistungsquote zu haben sein. Falls erfolgreich, könnte dieser Anstieg aber teilweise durch den erhöhten steuer- und beitragspflichtigen Beschäftigungsgrad gegenfinanziert warden.

7) Unsere Berechnungsergebnisse widersprechen weithin akzeptierten Standardhypothesen über die positive Korrelation zwischen einer alternden Gesellschaft und künftigen öffentlichen Gesundheitsausgaben. Damit bewegen sie sich aber innerhalb eines Rahmens, der von der gegenwärtigen wissenschaftlichen Diskussion zu den Implikationen, die steigende Lebenserwartungen für die Gesundheitskosten haben, abgesteckt wird. Durch die Modellierung der Hypothese gesunden Alterns («healthy ageing hypothesis») wählen wir eine mittlere Position aus den verfügbaren quantifizierbaren Hypothesen.

Im Hinblick auf den Einfluss der gesamten Gesundheitsausgaben auf die Finanzentwicklung der GKV (die nur als Käufer eines Teils aller Gesundheitsleistungen fungiert) spiegeln unsere Resultate darüberhinaus bestimmte Charakteristika der versicherten Bevölkerung, altersabhängige Presisniveaus von verschriebenen Arzneimitteln und anderes wider; in der Summe wirken diese Einflüsse kostendämpfend. Dennoch zeigt der gesetzliche Beitragssatz trotz zunehmender Bundeszuschüsse selbstverständlich einen steigenden Trend, der im wesentlichen durch die «verbleibenden» Effekte, die aus der Alterung der Gesellschaft resultieren, und andere inhärente Kostenursachen des Gesundheitswesens (Arbeitskosten u.a.m.) zu erklären sind.

Wir halten Massnahmen zur Verhinderung weiterer Betragssatzanstiege in der GKV für vorrangig geboten; daher sollte eine Ausweitung der Beitragsbemessungsbasis in der GKV Vorrang haben vor ähnlichen Schritten im Bereich anderer Institutionen (Rente; Arbeitslosenversicherung); der kürzlich eingeführte, schrittweise ansteigende Bundeszuschuss ist ein hilfreicher erster Schritt aber offensichtlich nicht ausreichend um langfristige Beitragssatzstabilität zu erreichen.

[109] Uebereinkunft 128, Artikel 15 (3). http://www.ilo.org/ilolex/english/convdisp1.htm

Gleichzeitig wird empfohlen, den Gesundheitsfonds (eingeführt im Januar 2009) effektiv zu nutzen und im Sinne eines vereinten Gesundheitssystems so weiterzuentwickeln, dass die Trennung von öffentlichen und privaten Käufern von Gesundheitsleistungen überwunden und die Möglichkeiten der Optimierung einer simultanen *Kontrolle von Kosten* und *Verbesserung der Qualität von Leistungen* so verbessert werden, dass dabei gleicher Zugang zu Gesundheitsdienstleistungen für die ganze Bevölkerung gewahrt bleibt.

Glossary

Actual social security contribution

Employers' and employees' actual social contributions and social contributions actually paid by self-employed and others.

Beneficiaries

Persons covered by social protection schemes receiving one or several benefits in cash or in kind.

Compensation of employees

Total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period. Compensation of employees consists of wages and salaries, and of employers' social contributions.

Contribution assessment ceilings

Value (in currency) stipulating the maximum amount of individual monthly / annual income (wage) from which contributions are being collected.

Defined daily dose (DDD)

WHO statistical measure of drug consumption.

Dependency ratio

Statistical indicator relating the economically «non-productive» to the economically «productive» members of a population.

Total dependency ratio = Youth dependency ratio + Old-age dependency ratio

Youth dependency ratio = Youth population / Actives population

Old-age dependency ratio= Old-age population / Actives population

Youth= population aged from 0 to around 15~20

Actives = population aged from 15~20 to 60~65

Old-age=population aged above 60~65

Equivalent pensioner

Total volume of pension payments divided by the standard pension (= pension based on 45 years of contribution payment at average income level); the equivalent pensioner is input to the calculation of the sustainability factor.

Equivalent contributor

Total volume of contributions collected divided by the contribution paid by the average insured income; the equivalent contributor is input to the calculation of the sustainability factor.

Fertility Rate

A statistical measure of fertility, it can be obtained by calculating the number of children born during a period over the total population in the middle of that period.

GDP

Nominal GDP = the value of all goods and services produced less the value of goods and services used as input to production, GDP = output – input. GDP measures the output available for final use. There are three standard perspectives to look at GDP, demand side, supply side and primary income allocation.

Demand side:

GDP = Private consumption + state consumption + private investment + state investment + exports – imports

Supply side:

GDP = sum of sectoral values added

Primary income allocation:

GDP = Profits + Labour income

Labour income = employer contributions + gross wages

Gross wages = employee contributions + employee wage tax + net wages and salaries

Real GDP = Nominal GDP divided by GDP deflator.

GDP deflator

A price index; measures the change in prices of all domestically produced goods and services available for final use.

Imputed contribution

The bookkeeping (revenue) equivalent to social benefits paid directly by employers.

Inpatient hospital days

Number of days a patient stays in hospital.

Labour force

The sum of the number of persons employed and unemployed.

Labour force participation rate

A measure of the proportion of a country's working-age population that engages actively in the labour market, either by working or looking for work. It can be calculated by expressing the number of persons in the labour force as a percentage of the working-age population.

Labour income share

Ratio between labour income (compensation of employees) and nominal GDP.

Labour market balance

An analytical instrument helpful to control dynamic and structural consistency of labour supply and labour demand; labour supply = labour demand + unemployment.

Life expectancy

A measure of the average life span (e.g. in years) of a population cohort at any given age, usually measured at birth, often measured at retirement age.

Mortality rate

The intensity of occurrence of deaths in a population, can be obtained by dividing the observed total number of deaths by the population in the middle of a period, usually calculated by single age and sex.

Outpatient visit

Number of treatment of patients within a health system, excluding hospital days.

Population projection

Population in time *t* = population in (t-1) + newborn between (t-1) and (t) – deaths between (t-1) and (t) + net migration between (t-1) and (t).

Newborns are projected based on the fertility rates of the female population in fertile age (15~49).

Deaths are projected based on the mortality rates.

Productivity

Real value of goods and services produced per employed person (real GDP divided by actual total employment) or per hour worked (real GDP divided by the total volume of hours worked).

Replacement rate

The ratio of the amount of cash benefits to the underlying insurable earnings, calculated either individually or as an average for a group of persons, or for all beneficiaries of the scheme.

Individual replacement rate:

ratio between the last monthly salary before benefit is received;

Standard replacement rate:

ratio between a defined typical benefit and a typical wage in a given period;

System replacement rate:

ratio between the average of all benefits and the average contributive wages of the same period.

Social budget

Systematic account of a country's social expenditure and the resources required for financing it (social revenue)

Institutional breakdown of the German social budget

The institutional breakdown of the social budget presents social expenditure (and the respective revenue) by the institutions that pay benefits directly to the private households; the following table reflects the institutional breakdown as presently applied by the Ministry of Labour and Social Affairs (BMAS), including statistical information:

Leistungen nach Institutionen	2000	2001	2002	2003	2004	2005	2006
	Million Euros						
Total social budget	***645426***	***662687***	***685021***	***699105***	***697390***	***700165***	***700160***
1 General systems	*407238*	*420038*	*436446*	*446005*	*443199*	*460131*	*463043*
11 Pension insurance	217428	224348	232400	238121	239584	239894	239963
12 Private old-age provisions							
13 Health insurance	132043	137085	141225	143336	138110	141984	146830
14 Long-term care insurance	16668	16841	17288	17408	17534	17841	18040
15 Accidents insurance	10834	10933	11252	11347	11299	11228	11181
16 Employment promotion (UI)	64596	65400	71136	73310	73557	87745	83242
2 Special systems	*5230*	*5454*	*5630*	*5805*	*6086*	*6461*	*6746*
21 Old-age security farmers	3272	3334	3314	3297	3231	3166	3129
22 Old-age security liberal professions	1958	2120	2316	2508	2855	3295	3617
3 Civil service schemes	*48567*	*51065*	*51700*	*52493*	*52695*	*52511*	*49829*
31 Pensionens	32611	34527	35005	35501	35614	35727	35677
32 Family overheads	7033	7061	6987	6986	7019	6094	2968
33 Health assistance	8922	9477	9709	10006	10062	10691	11183
4 Employer sponsored systems	*56102*	*57203*	*56016*	*56377*	*56626*	*56228*	*56509*
41 Continued payment of wages	27077	27458	26350	26340	25920	25355	25281
42 Occupational pension schemes	17520	18211	18410	18650	18990	18930	19070
43 Additional pensions for public sector employees	8122	8343	8465	8707	9076	9280	9494
44 Other benefits	3383	3191	2791	2680	2640	2664	2663
5 Compensatory systems	*6530*	*6016*	*5726*	*5516*	*5147*	*4722*	*4266*
51 Social compensations	5077	4743	4577	4445	4137	3796	3406
52 Equalisation of post-war burdens	133	115	100	88	74	65	57
53 Reparations	1195	1011	890	843	823	764	718
54 Other compensations	124	147	158	140	113	97	86
6 Support and promotion systems	*52898*	*53624*	*55790*	*58585*	*60137*	*48508*	*48494*
61 Social aid	25749	25904	26544	28569	29731	21891	21921
62 Child and youth aid	17328	17695	18250	18629	18738	18970	19001
63 Child benefits	106	101	108	110	111	210	243
64 Education grants	3732	3628	3648	3481	3354	3148	3055
65 Promotion of training	878	1194	1526	1670	1743	1822	1842
66 Housing benefits	4315	4286	4922	5225	5632	1713	1681
67 Promotion of savings	790	816	792	902	828	753	750
7 Indirect benefits	*69719*	*70160*	*74621*	*75301*	*74508*	*72642*	*72354*
71 Tax measures	38064	38139	38671	39221	38208	36142	35654
72 Equalization of family burdens	31654	32021	35950	36080	36300	36500	36700

Source: BMAS; Spring 2007.

Funktional breakdown of the German social budget

The same benefits can be broken down functionally, i.e. by their purpose. In this case the systemic breakdown is as follows:

Benefits by function	2000	2001	2002	2003	2004	2005	2006
	Million Euros						
Total social budget	***645426***	***662687***	***685021***	***699105***	***697390***	***700165***	***700160***
Marriage and Family	*96391*	*97371*	*102290*	*103227*	*102696*	*102654*	*100049*
Children and youth	65871	66727	71166	71813	71752	72773	71270
Spouses	26022	26147	26663	26789	26224	24647	23376
Maternity	4497	4497	4460	4625	4720	5235	5403
Health	*221456*	*228980*	*233665*	*237348*	*232546*	*237250*	*242504*
Prevention and rehabilitation	12034	12560	13029	13272	13226	13264	13467
Sickness	149244	154752	158044	160693	155615	159094	163229
Occupational accident / disease	13179	13379	13389	13397	13090	13051	13149
Invalidity (general)	46999	48289	49202	49986	50615	51840	52659
Employment	*61468*	*62807*	*66234*	*68596*	*66930*	*57227*	*52535*
Occupational training	13612	14613	15599	14345	12516	10102	9448
Mobility	11668	10218	10015	10007	9778	7002	6127
Unemployment	36188	37976	40619	44244	44636	40123	36959
Old-age and survivors	*243811*	*251711*	*260839*	*266493*	*271115*	*274252*	*275408*
Old-age	235662	243762	252678	258544	263567	266718	267869
Survivors	8149	7949	8161	7949	7548	7534	7539
Political events	*3049*	*2691*	*2565*	*2459*	*2262*	*2189*	*2092*
Housing	*7193*	*7112*	*7833*	*8134*	*8565*	*14272*	*15769*
Savings / wealth	*10089*	*10040*	*9729*	*9973*	*9779*	*9296*	*8697*
General social aid	*1969*	*1975*	*1867*	*2875*	*3496*	*3026*	*3106*

Source: BMAS; Spring 2007.

The projections underlying this report were calculated on the basis of an institutional breakdown for the general systems pension insurance, health insurance and long-term care insurance as well as for employment promotion (UI) and the civil servants pension scheme; the other benefits were calculated on the basis of a functional breakdown.

Breakdown of social budget revenue by type of income

Social budget expenses have to be financed through revenue. Different breakdowns are possible. This report applies the following:

Revenue by type	2000	2001	2002	2003	2004	2005	2006
	Million Euros						
Total social budget	***670630***	***681388***	***699060***	***715474***	***718243***	***718917***	***730255***
Social contributions	*415458*	*419437*	*423170*	*428572*	*429732*	*425714*	*435050*
Employer contributions	242173	243510	243809	245600	243659	237805	240590
Actual contributions	165542	167763	170067	172653	171514	168122	170335
Imputed contributions	76632	75747	73742	72947	72145	69683	70256
Contributions by the insured	173285	175928	179361	182972	186072	187909	194459
Employees	142411	144594	145520	148359	147798	148716	155019
Self-employed	7062	7204	7558	7970	8275	8429	8257
Recipients of benefits	15467	15907	16579	17328	18843	18728	18971
Others	8345	8223	9703	9316	11156	12036	12213
Public subsidies	*239682*	*247084*	*263362*	*274216*	*275867*	*280681*	*282668*
Other revenue	*15490*	*14867*	*12529*	*12686*	*12645*	*12522*	*12538*

Source: BMAS; Spring 2007.

Social budgeting

A method based on formal models aiming at comprehensive financial evaluation of a country's social protection system (requires social budget and other related statistics).

Social expenditure ratio

Social budget expenditure in per cent of GDP.

Sustainability factor

Factor in the German pension adjustment formula; reflects the (annual) change of the number of (equivalent) pensioners over the number of (equivalent) contributors. An increase of the ratio reduces the pension adjustment, and vice versa.

Utilization rates

A measure for the intensity of usage of a health system through the population, usually differentiating at least by in- and out-patients, by sex and by single ages / age groups.

Working Time

Measures the time worked in hours by employed persons during a given period, for example a year;

distinction is often made between different types of employed (e.g. self-employed, employees) and by sex;

overtime is measured as difference between actual (effective) working time and contractual or standard working time.

References

Auerbach, A.J.; Kotlikoff, L.J. *The Methodology of Generational Accounting*. In: Auerbach, A.J.; Kotlikoff L.J.; Leibfritz, W. (eds.): Generational Accounting Around the World. The University of Chicago Press, 1999. National Bureau of Economic Research project Report.

Berié, H. *Das Sozialbudget*. Bonn-Bad Godesberg, 1970.

Bundesministerium für Arbeit und Soziales (BMAS; Hrsg.): *Sozialbudget 2006. Tabellenauszug*. Eigenverlag. Mai 2007. http://www.bmas.bund.de (download) [Federal Ministry of Labor and Social Affairs (ed.): *Social budget 2006. Table excerpt*. May 2007. http://www.bmas.bund.de (download), in German]

Bundesministerium für Familie, Senioren, Frauen und Jugend (BMFSFJ): *Kindertagesbetreuung fuer Kinder unter drei Jahren*. Bericht der Bundesregierung ueber den Stand des Ausbaus fuer ein bedarfsgerechtes Angebot an Kindertagesbetreuung fuer Kinder unter drei Jahren. Juli 2007.

Bundesministerium für Gesundheit (BMG): *Gesundheitsreform*. http://www.bmg.de/cln_116/nn_1168682/SharedDocs/Standardartikel/DE/AZ/G/Glossarbegriff-Gesundheitsreform.html (July 2008)

Bussmann, L.; Koch, W.A.S., Warneke, P. *Der Wertschöpfungsbeitrag zur Finanzierung der gesetzlichen Rentenversicherung*. Campus. Frankfurt/New York, 1992; 295 pages.

Cok, Mitja, Jože Sambt, Aleš Berk Skok and Marko Košak (2007): Long-Term Sustainability of the Slovenian Pension System. In: Economic and Business Review for Central and South-Eastern EuropeVol.10, No.4

Deutscher Bundestag, Drucksache 16/9299 vom 27. 05. 2008, 16. Wahlperiode: *Entwurf eines Gesetzes zur Förderung von Kindern unter drei Jahren in Tageseinrichtungen und in der Kindertagespflege (Kinderförderungsgesetz – KiföG)*. Gesetzentwurf der Fraktionen der CDU/CSU und der SPD.

European Commission. *European employment strategy. What is flexicurity?* http://ec.europa.eu/employment_social/ employment_strategy/flex_meaning.en.htm (July 2008)

—. *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004–2050)*. Report prepared by the Economic Policy Committee and the European Commission (DG ECFIN). European Economy. Special Report n° 1/2006.

Fehr, H.; Heinrich Jess (2006). *Health premiums or health contributions? An evaluation of health care reform options in Germany*. Schmollers Jahrbuch (126.), Heft 1, S. 21-57.

Heilmann, S. *Die Volksrepublik China als lernendes autoritäres System*. Experimentierende Staatstätigkeit und wirtschaftliche Modernisierung. In: NZZ Online, 28 Juni 2008. http://www.nzz.ch/nachrichten/wirtschaft/aktuell/die_volksrepublik_china_als_lernendes_autoritäres_System_1.771145.html.

International Labour Office. *Évaluation actuarielle et financière du régime general d'assurance pension du Grand-Duché de Luxembourg*. Bureau international du Travail – Genève, 2001. (OIT/TF/Luxembourg/R.2.)

—. *Key Indicators of the Labour Market (2003-2004)*. Geneva, 2003.

—. *Social protection as a productive factor*. Governing Body Geneva, 294th Session, November 2005 (Committee on Employment and Social Policy ESP, GB.294/ESP/4.)

—. *C102 Social Security (Minimum Standards) Convention, 1952. Convention concerning Minimum Standards of Social Security*. http://www.ilo.org/ilolex/english/convdisp1.htm

—. *C128 Invalidity, Old-Age and Survivors' Benefits Convention, 1967. Convention concerning Invalidity, Old-Age and Survivors' Benefits.* http://www.ilo.org/ilolex/english/convdisp1.htm

—. *Thailand. Proposal for a Revised Capitation Calculation and Financial Equalisation System*. ILO component Financial Management of the Thai Health Care System (THA/05/01/EEC) under the Health Care Reform Project between the EU and the Kingdom of Thailand (THA/AIDCO/2002/0411); Draft 1, 2008. (Forthcoming)

—. *The ILO Population Projection Model (ILO-POP).* A Technical Guide (Version 1.1. 8/2002). The International Financial and Actuarial Service (ILO-FACTS), Financial, Actuarial and Statistical Services Branch, Social Protection Sector, International Labor Office, Geneva, 2002.

—. *The ILO Social Budget Model*. A Technical Guide (Version 8/1999). The International Financial and Actuarial Servic (ILO-FACTS), Financial, Actuarial and Statistical Services Branch, Social Protection Sector, International Labor Office, Genva, 1999.

Mortensen, J. *Ageing, Health and Retirement in Europe*. The AGIR Project. Final Report on Scientific Achievements. ENEPRI Research Report No. 11, July 2005 (ENEPRI-European Network of Economic Policy Research Institutes.)

Organization for Economic Cooperation and Development. *Projecting OECD Health and Long-term Care Expenditures. What are the Main Drivers?* Economics Department Working Papers No. 477. ECO/WKP(2006)5, 2006.

Plamondon, P.; Drouin, A.; Binet, G.; Cichon, M.; McGillivray, W.R.; Bédard, M.; Perez-Montas, H. *Actuarial practice in social security*. Quantitative Methods in Social Protection Series. International Labor Office / International Social Security Association, Geneva 2002.

Rice, N.; Smith, P. *Approaches to Capitation and Risk Adjustment in Health Care.* An International Survey. The University of York. Centre for Health Economics. October 1999.

Scholz, W.; Cichon, M.; Hagemejer, K. *Social budgeting*. Quantitative Methods in Social Protection Series. International Labour Office / International Social Security Association, Geneva 2000.

Scholz, W.; Drouin, A. *Regular adjustment of financial parameters of social protection systems in volatile inflationary environments*. In: International Social Security Review, 1/98, Vol. 51, No. 1, 1998, pp. 47 to 71. Blackwell Publishers.

Schulz, E. *Alternative Scenarios for Health, Life Expectancy and Social Expenditure*. ENEPRI Research Report No. 4, February 2005. (DIW-German Institute for Economic Research; ENEPRI-European Network of Economic Policy Research Institutes.)

Stolz, U.; Rieckhoff, C. *Zulagenförderung für das Beitragsjahr 2004 durch die Zentrale Zulagenstelle für Altersvermögen (ZfA)*. In: RVaktuell 9/2007, pp. 306 to 313.

Unabhaengige Kommission Zuwanderung: *Zuwanderung gestalten, Integration foerdern*. Bericht der Unabhängigen Kommission 'Zuwanderung', July, 4th, 2001.

Annex 1. The ILO social budget modelling approach

The ILO's approach to social budget modeling is modular. The model consists of several sub-models, which can be used simultaneously, or stand-alone. The model consists of the following components:

- a *demographic model* which is used for population projections,
- a *labour supply model* which allows for labour supply projections,
- an *economic model* which is used for projecting GDP, prices, wages, labour productivity and employment,
- a *government budget model* which describes revenue and expenditure of the different administrative levels of government (except social security),
- a *social protection model* which consists of pension, health and other social projection submodels.

Demographic model

The demographic model as used by ILO-SEC/SOC is an adaptation of the UN population model, which moves a country's population, separately by sex and single ages (or age groups) from T to T+1, based on the following fundamental equation:

> Population in T = Population in T-1 + Newborns between T-1 and T – Deaths between T-1 and T + Net migration between T-1 and T

The model requires the following information as input:

> Population by sex and single age in T (base year)
>
> Number of newborns by sex and by age of mother
>
> Number of deaths by age at time of death and sex
>
> Number of immigrants and emigrants

Labour supply model

The labour supply model calculates total labour supply on the basis of the results of the demographic model, using labour market participation rates (by sex and single ages); over the projection period labour market participation rates are either assumed exogenously (scenario approach) or calculated on the basis of logistic functions (with exogenously assumed maximum values) or on basis of a cohort approach (OECD).

Economic model

The economic model is deterministic (based on definition equations); main outputs are employment (labor demand), GDP (real, nominal), wages; prices, i.e. all variables that are necessary input to the social budget revenue and expenditure projections.

Government budget model

This model calculates revenue and expenditure of central, state and local governments (government accounts, except social security). It is used to assess the fiscal effects of the projected financial development of the social budget on the general government net lending or borrowing position.

Social protection model

The social protection model maps the expenditure and revenue of all major branches of the social protection system (social budget). Its actual application depends on the social system's concrete organization, the social protection model can be applied to the institutional or functional breakdown of the social budget (or to a combination of both).

Annex 2. The health model

Expenditure on health (function health in the German social budget) consist of various categories, among which the most important are

- Health expenses of the SHI,
- Health expenses of the LTCI,
- Health expenses under the CSMBS,
- Continued payment of wages and salaries (CPW) in case of sickness.

Under SHI and LTCI expenses are being financed out of contributions and other income; in the other schemes expenses are identical with revenue.

Social health insurance (SHI)

In its basic approach the health projection model follows projection techniques that drive expenditure through a combination of demographic and non-demographic variables. However, it deviates from the mainstream projection techniques by adding institutional settings specific to the German health care system, which are assumed to have profound impacts on the future development of Germany's public health care expenses.

The health module has four interdependent parts:

(1) *Coverage*: describes who, in the German population, is covered by the public health system, and which principle benefit packages are being offered; also, this part models the specific feature of the German system which allows some groups among the German labour force to opt out of the SHI and instead choose private health insurance. Opting out is allowed for civil servants, for self-employed and for employees that earn wage income above the compulsory insurance ceiling; as virtually all civil servants have opted for private insurance no special attention is given in the model towards their possible opting-in opting-out behaviour. For the other groups income-dependent vectors have been applied to derive annual estimates of the total number of insured persons under SHI.

(2) *Utilization*: health system utilization is being reflected through (5 year-) age-group specific *utilization rates* under four categories of system uses:

   - *inpatients*,
   - *outpatients*,
   - *use of pharmaceuticals*, and
   - *other* uses.

The rates were estimated on the basis of national data; the rates constitute the start-values for the projections, and have been assumed to change in line with certain health-policy assumptions ; in multiplying those age-group related rates with the different types of contributors (see «coverage», above) - by age groups – the model calculates sub-totals of annual numbers of contacts of the covered population with the health system; the utilization rates for inpatients are complemented by assumptions on the future development of the average length of hospital stay.

(3) *Expenditure*: calculates total SHI expenses (technically as sum-products of the respective vectors) by multiplying the total number of contacts (per the above categories and by age group) with the expenses per contact («unit costs»). Unit costs, thus, are defined by (i) expenses per inpatient admission (by age group), (ii) expenses per outpatient visit (by age group) and (iii) the expenses per defined daily doses (DDD) of pharmaceuticals (by age group). For the start year of the projections, estimates for the unit costs (by category and age group) were derived from official data (the "national risk adjustment mechanism"). Estimates were calibrated such that the *sum-totals of the sum-products* match total recorded expenditure.

Per capita expenditure is being projected after desegregating the major expenditure categories (spending on inpatients, outpatients, pharmaceuticals, sickness benefits, dentists and on other cost categories of the SHI) into labour-cost and non-labour-cost components.

The health specific labour cost component is projected in line with total labour productivity (growth rate of wages) plus a mark-up that takes into account the expectation of above-average wage and salary increases of medical staff; it is assumed that the mark-up tapers off after a couple of years.

The non-labour-cost component within those main categories is assumed to grow in line with GDP / capita. [110]

National as well as ample international experience strongly indicates that health care costs can also in future be expected to grow inherently faster than general income. There are mainly two reasons bolstering this assumption:

(1) Technological progress increases also in future the variety and quality of products and treatments.

(2) Even if technological progress were assumed cost-saving and reducing the relative prices of health products and services the overall expenditure may still rise because of the evidently high price elasticity of private households' demand for health care.

At the same time, however, it has to be taken into account that the increasing significance of governments' cost containment policies (not only in Germany) induces additional demand for cost-saving technologies.

On these grounds, until 2010 the model, on top of the GDP-per-capita-path, marks-up the projection path of non-labour-cost expenditure by a further 1 percentage-point, which decreases to 0.5 percentage points by 2020, remaining at that level afterwards. One might consider these "0.5 percentages" reflecting the impact of long-term health related technological progress.

(4) *Revenue*: describes the system's revenue (contributions, subsidies, other revenue); projects the number of contributors within the overall context of Germany's labour market balance (while taking into account the coverage issue as described under (1)), applies a policy variable reflecting public transfers to the SHI, and other – residual – revenue items; this part projects total SHI revenue by modelling core aspects of current legislation, including the effects of the "GKV-WSG" (Wettbewerbs-

[110] The (possible) assumption of an increase of total per capita expenditure in line with GDP / capita (which may come in «handy») would imply an income elasticity of 1 throughout the full projection period, which, under our modelling approach, was not considered plausible.

stärkungsgesetz: law on strengthening competition among SHI institutions). Revenue is generated through contributions paid by employers, employees, self-employed, recipients of unemployment benefits ("ALG 1" and "ALG 2"), pensioners and other groups (students, persons holding irregular jobs, etc.). The foreseen effects of increasing the share of tax revenue dedicated to the SHI is taken into account: from 2009 onward the annual federal subsidy ("Bundeszuschuss") increases by 1.5 billion € until it reaches 14 billion € in 2016. After 2016 it is assumed that the relative share of the federal subsidy to SHI remains unchanged relative to GDP.

At given average wages the total *income* of SHI is calculated as the sum of contributions and public subsidies. The contribution rate is calculated as a cost-covering PAYG-rate, i.e. after taking public transfers exogenously into account.

Special characteristics of the applied SHI model version

Healthy ageing

There is ongoing international debate among health modellers concerning the most appropriate ways of implementing, in health care expenditure projections, the impacts of technological progress on ageing populations.

More specifically, the debate is how technological progress influences a given (ageing) population's health status. The following three hypotheses on the relationship of technology and health status that can be found in the literature, can be made reasonably operational in a formal modelling context:

- The *compression of morbidity* hypothesis assumes, that an increase in longevity translates into an ever shorter share of life lived in relatively bad health.

- The *dynamic equilibrium* («*healthy aging*») *hypothesis* posits, that the absolute number of life-years lived in bad health remains constant in the wake of increased longevity.

- The *expansion of morbidity hypothesis* states that longevity translates into a higher share of life lived in relatively bad health, as older people become more vulnerable to chronic diseases and spend more time in ill-health.

Research related to testing these hypotheses is still in its early stages. However, while the current political debate often seems to be favouring the (unproven) *expansion of morbidity hypothesis* we decided to apply the *dynamic equilibrium hypothesis* as it seems to be reflecting a middle path of future health cost implications of ageing societies. In other words, the model results presented in this report have been designed along the healthy ageing hypothesis. Adjustment of the model, and of its results, to the other two hypotheses is possible. [111]

It should be mentioned that none of the above hypotheses stipulates changes in morbidity at higher ages. Thus far, we assumed that health-technological progress is age-neutral. Thus, morbidity, under these hypotheses, can change at any age group – typically one

[111] The model, in principle, allows for implementing each of the three hypotheses, and calculating their respective cost-implications. However, the additional work required to modify the model, check results and offer proper interpretations, would have gone beyond the scopeof the project.

would assume that the technological effects would be equally distributed over all age groups of the population.

Death costs

There is however strong empirical evidence that a very high share of an average person's life-time health care spending is concentrated on the final years of life. [112] This observation suggests separating the observed high health care costs of older people into a demographic component and a «closeness to death» component. In a *death costs scenario* the whole population (by sex and single ages) is split into two further vectors: survivors and decedents. As a result of such differentiation the *demographic* pattern of health care utilization, i.e. of those who survive is less steep; accordingly, the impact of the ageing of a population is less profound than in a «standard» projection design. In the SHI model the death costs scenario approach was taken into account by applying a technique which was developed for health care projections of EU member states in the European Policy Committee.

Modelling the segmentation between SHI and PHI («opting-out»)

As far as we are aware of other attempts of projecting Germany's SHI finance these have been based on assuming that the observed coverage rates (numbers of insured by sex and age groups divided by the respective sex and age categories of the total population) remain unchanged thus reflecting strong «what-if» modelling characteristics.

However, these attempts systematically ignore the observation that the share of private insured in the higher age groups of the population (80 years and above) is currently less than 5 per cent, whereas, for example, it is about 25 per cent among all men and 15 per cent among all women in the age group 40 to 44. The reason for this observation is that - before recent reforms took place - persons could easily switch from PHI to SHI once they reached higher ages (e.g., at retirement); as a result, currently (still) the vast majority of older people is insured under SHI. The reason for switching was simply that PHI is cheap (low premiums) during average persons' active lives while turning increasingly expensive at higher ages, as higher morbidity rates feed into PHI profitability and, thus, require raising premiums, whereas SHI, based on solidarity financing principles, maintains equal contribution rates for all members.

The possibility of adverse selection – much to the advantage and profitability of the PHI (while putting the SHI under increasing financial pressure) – was abolished as a result of the various reform measures over the past 10 years: the way back to SHI has meanwhile been almost fully blocked for persons who have opted out (and chose joining PHI).

This important change in institutional settings was taken into account in the here-applied model design. Accordingly, it projects that the share of privately insured elder persons within the total population increases over the next 40 years (and after) and reaches almost the same share that is currently observed among the cohort of persons aged 40-44. In simplifying: those who are privately insured now will also be privately insured in 40 years. The PHI coverage of the age group of those 40-44 was chosen as a benchmark supported by empirical observation.

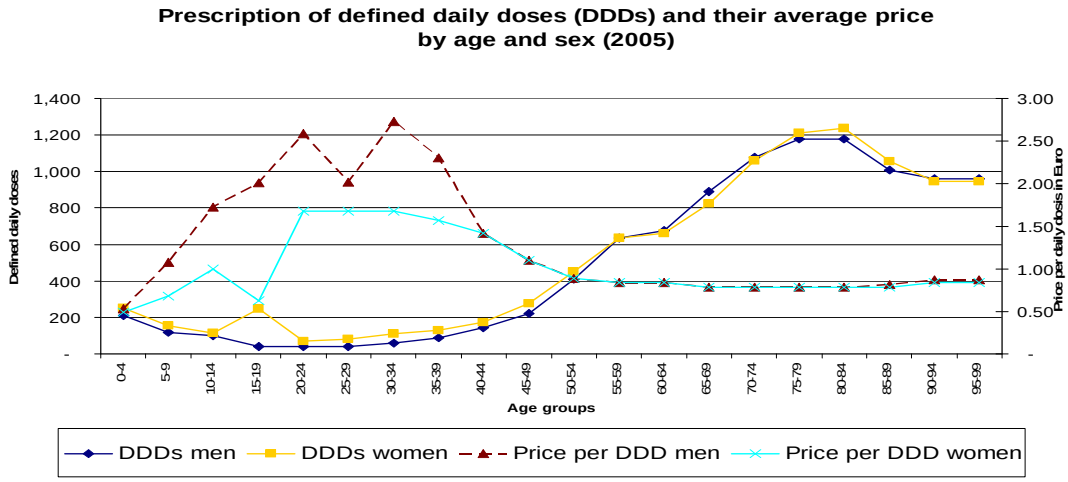
The financial implication is that in the decades to come a growing share of the health costs allotted to elder persons will be financed by PHI (as a result of the ratchet effect for those

[112] This evidence must be taken into account under any of those three morbidity hypotheses.

who chose to opt out), and not any longer by SHI. As a result, the model correctly projects significantly less dynamic public health care expenditure than models which do not take carefully account of recent years' legislative changes.

Price vector of pharmaceuticals

To project the expenditure on pharmaceuticals an age-related *price vector* of pharmaceuticals (costs per defined daily doses (DDD) by sex and age group) has been applied; this approach is based on the observation that significant age-dependent differences in the average prices of prescribed drugs can be observed: drugs prescribed for younger age-cohorts tend to be substantially more expensive than for older age-cohorts.



At the same time, the age-related utilization pattern of prescribed drugs has the expected shape with an increasing number of prescriptions among the older age cohorts (typical J-curve).

By taking both, (i) the significant age-related differences in the prices of prescribed pharmaceuticals and (ii) the typical J-curve of utilization into account, ageing has a cost-increasing impact on the financial projections through the utilization pattern, and a cost-saving impact through the price vector, where prices are significantly higher for pharmaceuticals applied to younger than to older persons.

As a result, expenditure on pharmaceuticals grows with lower annual rates than in modelling approaches based on simple average cost-per-prescription extrapolations.

Long-term care insurance (LTCI)

Modelling LTCI is similar to the approach used for the SHI model. The coverage and revenue modules are taken directly from the health module.

Utilization is derived through age-dependent probabilities for insured persons to become a nursing care case within any calendar year. Utilization patterns are split between inpatient and outpatient nursing cases.

Utilization patterns as well as unit costs are derived by considering the actual composition of the three nursing care levels for inpatient as well as outpatient nursing care cases (Pflegestufen I – III).

Utilization is driven through demography and coverage; unit costs are extrapolated on the basis of GDP/capita-developments.

Standard modelling attempts of long-term care expenditure have extrapolated expenditure parallel to labour productivity, thus reflecting the underlying assumption that labour intensive long-term care is mainly driven through the wages paid by the service providers. However, this approach denies any effects of possibly efficiency gains that can be expected in future. Also, the recent LTCI reform states that benefits within the long-term care insurance will be adjusted in line with inflation.

The chosen projection path stays below a purely wage driven extrapolation but remains clearly above a pure inflation adjusted yearly increase of benefits. It reflects therefore a mix of cost-driving wage pressure and cost-containment policies to tackle this cost pressure within the institutional frame of the LTCI.

Also, the recently decided gradual implementation of add-ons to the three long-term care levels, within the next 5 years, have been taken into account.

With the utilization pattern of the SHI ageing scenario applied, it is implicitly assumed that the probabilities of long-term care cases decrease over time; in other words, they shift to higher age-groups.

Civil servants medical benefits scheme (CSMBS)

Per-capita spending of the CSMBS is being adjusted with the same growth rate as per capita expenses of the SHI. The reason is that recent SHI reforms have been implicitly applied also to the medical benefit system of the civil servants. Per capita development is multiplied by the number of civil servants in order to project total CSMBS spending. No specific model was developed with respect to the dependency structures within the medical benefit system, i.e. it was implicitly assumed that the *relative shares* of married civil servants with non-working spouses, and of civil servants' children, remains unchanged over the projection period.

CSMBS revenue is identical to expenses.

Continued payment of wages and salaries in case of sickness (CPW)

CPW was modelled on the assumption that the relative share of the number of sickness cases within total employment remains constant over the projection period. In other words, CPW is over the full projection period a constant function of the domestic sum of wages and salaries.

CPW is being financed through imputed contributions.

Health spending under other public schemes and programmes

The above schemes explain more than 90 per cent of total spending of the social budget's function health. The rest was modelled as a constant relation to those expenses. It should be noted that the functional breakdown of the social budget (and, thus, of the function health) contains the administration costs of all schemes / programmes included. In international comparison, the administration costs of Germany's social protection system are very low.

Annex 3. The model for the social pension insurance (SPI)

The following documentation was prepared by Dr Heinrich Jess, DRV-Bund, Berlin, who kindly made it available for the publication of this report.

The documentation reflects the model version that was used for the purposes of this report.

Core input data for the model (demography, labour market, and economic variables) were made available by ILO-SEC/SOC (see main body of report) and were not under the responsibility of DRV-Bund. Also, DRV-Bund did not calculate or contribute to any of the reform options mentioned or discussed in the report.

German Federal Pension Insurance

Pension Insurance Model
-Structure and Elements-

Dr Heinrich Jess
Berlin, August 2008

Program sequence

SUBROUTINE ***INIT***	(initialization of central variable)
SUBROUTINE ***GETWAGE***	(calculation of income profiles, according to DRV statistics)
SUBROUTINE ***POPMOD***	(aggregation of population)
SUBROUTINE ***POPIN***	(reads population and several rates)
SUBROUTINE ***POPOUT***	(prints population)
SUBROUTINE ***AVEPIN***	(reads earning points (accrued future pension rights) for the first year of projection, amount of points depends on the number of years worked)

Main-program including asset calculation

SUBROUTINE ***EARNPOINT***	(calculation of earning points according to labour participation and distinguished by age)
FUNCTION ***YAV***	(calculates average income)
FUNCTION ***AVINC***	(calculates total sum of income)
FUNCTION ***EMPLOY***	(calculates total employment)
SUBROUTINE ***PENSION***	(disability pension, widow pension and old-age pension)
FUNCTION ***PENSVALUE***	(estimates pension value)
FUNCTION ***YAV***	(calculates average income)
FUNCTION ***NAGEYR***	(year in which someone at age of x turned to the age of y)
SUBROUTINE ***CONTRIBUTION***	(calculates the total amount of contributions)
FUNCTION ***YAV***	(calculates average income)
SUBROUTINE ***BUDGET***	(calculates the budget of the federal pension insurance)
SUBROUTINE ***OUTPUT***	(prints results)
FUNCTION ***YAV***	(computes average income)

Detailed subroutine description

Characteristics: sex, occupation, age, year, only one income group

Subroutine INIT

Initialization: growth rate of per capita income, interest rate, contribution rate to health insurance, share of federal subsidy, etc.

Subroutine GETWAGE

Calculation of income profile over the life cycle, separated according to sex

Subroutine POPMOD

Aggregation of population by sex and age

Subroutine POPIN

Reads: population (POP) by sex, age and year; labour force participation rate (EQ); probability of retirement at a certain age (ZQ); probability of getting married at a certain age (EHE); age i of a widow in the moment of death of her spouse aged j (WITWEN); mortality rate - men (ZQW).

Input-files:

BEV.TXT (population)

ZUGANG2007.TXT (probability of retiring at a certain age)

QXM.TXT (mortality rate - men)

EHE.TXT (share of men being married at a certain age)

WITWENMATRIX.TXT (age i of widow in the moment of death of spouse aged j)

EQM.TXT (labour force participation rate - men)

EQF.TXT (labour force participation rate - women)

Subroutine POPOUT

Print population

Output-file:

BEVÖLKERUNG 1

Subroutine AVEPIN

Earning points by age and sex for the first projection year (2007). The earning points are used to calculate the total pension payment amount in 2007. They are also used as point of reference in the year 2007 to calculate accrued future pension payments. Before the age of 60, age-specific earning points are derived from the DRV Statistics, after the age of 60; they are derived from the pension model (according to the age-specific average pension, divided by the pension value of the basic year (2007)).

Input-files:

EGP2005.TXT (age specific earning points from DRV-Statistics)

EGPRM2006.TXT (age specific earning points according to the age-specific average pension from DRV-pension-model)

Subroutine EARNPOINT

Computes the sum of age-specific earning points, subject to the contribution ceiling. We distinguish between earned income and unemployment pay. The unemployment rate in the relevant years is used to weight the earning points of the above two types of income. Thus, the contributor represents a hybrid type: on the one hand, the contributor is an employee in every year, on the other, the contributor is unintentionally unemployed for a few weeks during the respective year.

We obtain earning points in the year *t* for the income group i as a weighted sum of different income types (m):

$$EP_t^{sex,1,age,i} = \sum_{j=1}^{age} \sum_{m=1}^{2} \frac{Y_{t-j+1}^{sex,1,m,j,i}}{Y_{t-j+1}^{1,1}} * q_{t-j+1}^{sex,1,m,j,i}$$

The weight q (income from employment / unemployment pay) depends on the labour market situation in each year of employment. By computing pension amounts for the remaining years, variation in the labour market situation is taken into account. Thus, increasing unemployment during working age leads to decreasing pension amounts at retirement age.

Function YAV

Average earned income (m=1) of contributors (oc=1):

$$Y_t^{1,1} = \frac{\sum_{sex=1}^{2} \sum_{i=1}^{3} \sum_{j=15}^{64} Y_t^{sex,1,1,j,i} * q_t^{sex,1,1,j,i} * pop_t^{sex,j}}{\sum_{sex=1}^{2} \sum_{i=1}^{3} \sum_{j=15}^{64} q_t^{sex,1,1,j,i} * pop_t^{sex,j}}$$

Function AVINC

Total earned income:

$$\sum_{sex=1}^{2} \sum_{i=1}^{3} \sum_{j=15}^{64} Y_t^{sex,1,j,i} * q_t^{sex,1,1,j,i} * pop_t^{sex,j}$$

Function EMPLOY

Total number of contributors:

$$\sum_{sex=1}^{2} \sum_{i=1}^{3} \sum_{j=15}^{64} q_t^{sex,1,1,j,i} * pop_t^{sex,j}$$

Subroutine PENSION

Computes individual pension amounts by sex and age for each income group (i) on basis of the accumulated earning points at retirement age (l).

If retirement age (l) is less than 60 (disability pension), a non-contributory period and an actuarial deduction of max. 10.8% of the calculated pension amount are taken into account:

$$EPC_{t-k+l}^{sex,1,l,i} = \left\{ EP_{t-k+l}^{sex,1,l,i} + \frac{EP_{t-k+l}^{sex,1,l,i}}{\left[l-(a-1)\right]} * (60-l) \right\} * \left\{ 1 - \min\left[0.108, 0.036 * (60-l)\right] \right\}$$

Between age 60 and mandatory retirement age:

$$EPC_{t-k+l}^{sex,1,l,i} = EP_{t-k+l}^{sex,1,l,i} * \left[1 - 0.036 * (retage - l)\right]$$

At and after mandatory retirement age:

$$EPC_{t-k+l}^{sex,1,l,i} = EP_{t-k+l}^{sex,1,l,i}$$

Thus, the pension at the age of k in year *t* depends (1) on the pension value (ARW) in year t and (2) on the amount of earning points (EPC) accumulated by a person at the time of retirement at age l (year (t-k+l)):

$$PENS_{t}^{sex,1,k,i} = EPC_{t-k+l}^{sex,1,l,i} * ARW_{t}$$

For each year *t* the total amount of pension payment is calculated taking into account the probability to retire p, age k and sex from the actual population pop:

$$PENSION_{t} = \sum_{sex=1}^{2} \sum_{i=1}^{3} \sum_{k=a}^{100} \sum_{l=a}^{k} EPC_{t-k+l}^{sex,1,l,i} * ARW_{t} * p_{t-k+l}^{sex,l} * pop_{t}^{sex,k,i}$$

Accordingly, in each year *t* male/female retirees in income group i at age k dispose of different pension amounts, depending on the age l at retirement.

A widow's pension (sex=2) amounts to 60 % of her husband's pension who deceased at age l (sex=1). Variable qx denotes the age-specific probability for men to decease. The variable (E) denotes the probability of getting married at age l. The factor W denotes the probability for widows at age i to be married with a man that dies at the age j:

$$WPENSION_{t} = \sum_{i=1}^{3} \sum_{k=a}^{100} \sum_{l=a}^{k} \sum_{m=a}^{99} 0.6 * EPC_{t-k+l}^{1,1,l,i} * W_{t}^{l,m} * E_{t}^{l} * ARW_{t} * qx_{t-k+l}^{1,l} * pop_{t}^{2,k,i}$$

Function PENSVALUE

This function processes the pension value with respect to the growth rate of per capita income, the changes of the contribution rates to mandatory and voluntary («Riester») insurance, and the development of the sustainability factor.

Subroutine CONTRIBUTION

Computes the annual contribution paid by employed and unemployed persons according to the labour market situation. In addition, the subroutine calculates the total amount of earned income up to the contribution ceiling and the total amount of unemployment pay.

Subroutine BUDGET

Computes revenue (contributions from earned income and unemployment pay, federal subsidy (constant share of the total amount of pension payments), returns on assets) and expenditure (pension, payments for the pensioners' health insurance, rehabilitation and administration costs). In addition, we calculate the total monthly payment necessary to calculate the contribution rate for the ensuing year.

Subroutine OUTPUT

This function generates the following result files:

KENNZAHLEN (selected key data for mandatory pension insurance, such as contribution rate, pension value, pension level, sustainability factor, average income, etc.)

BUDGET (revenue, expenditure and assets)

ENTGELTPUNKTE (individual amount of earning points by sex and age)

RENTEN (pension payments by sex and age)

RENT (number of pensioners by sex and age)

RENTNER (total number of pensionera by age)

WITWEN (number of widows by age)

EPROFILE (life-cycle income profiles by sex)

Annex 4. The model for the civil servants pensions

The civil servants pensions were calculated by making use of a model developed by Mr Harald Dalezios, University of Speyer, Germany. The model was initially developed for estimating future civil servants pension spending by different government levels (Federation, States, and Municipalities); it was adjusted to the purposes of this report.

Core input data to the model (demography, labour market, economic variables) were made available by ILO-SEC/SOC (see main body of report) and were not under the responsibility of Mr Dalezios.

Projection of Civil Servants

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PEN_SIM

Diplom Volkswirt Harald Dalezios, Mag. Rer. Publ.
(University of Speyer)

[English translation of original German text by Wolfgang Scholz]

Introduction

For projecting future pension liabilities under the German civil service a *Vb.net–model* was developed on the basis of the German civil service personnel-statistics and pensioner-statistics (Personalstands- and Versorgungsempfaengerstatistik).

As a principle, long-term projections are not forecasts of future developments. Instead, these *ceteris* paribus calculations only show, under alternative assumptions, long-term calculatory impacts of (politically induced) exogenous changes today on the civil service population ("in future").

The respective calculations were based on four modules, where results of the modules are sequentially dependent; complexity of the modules depends on the availability of data and on the output received from the preceding module.

Module One projects the number of active civil servants until retirement; these results are input to

Module Two, which calculates the number of civil service pensioners; then

Module Three calculates the number of widow(er)s and orphans, using the results of modules one and two as input;

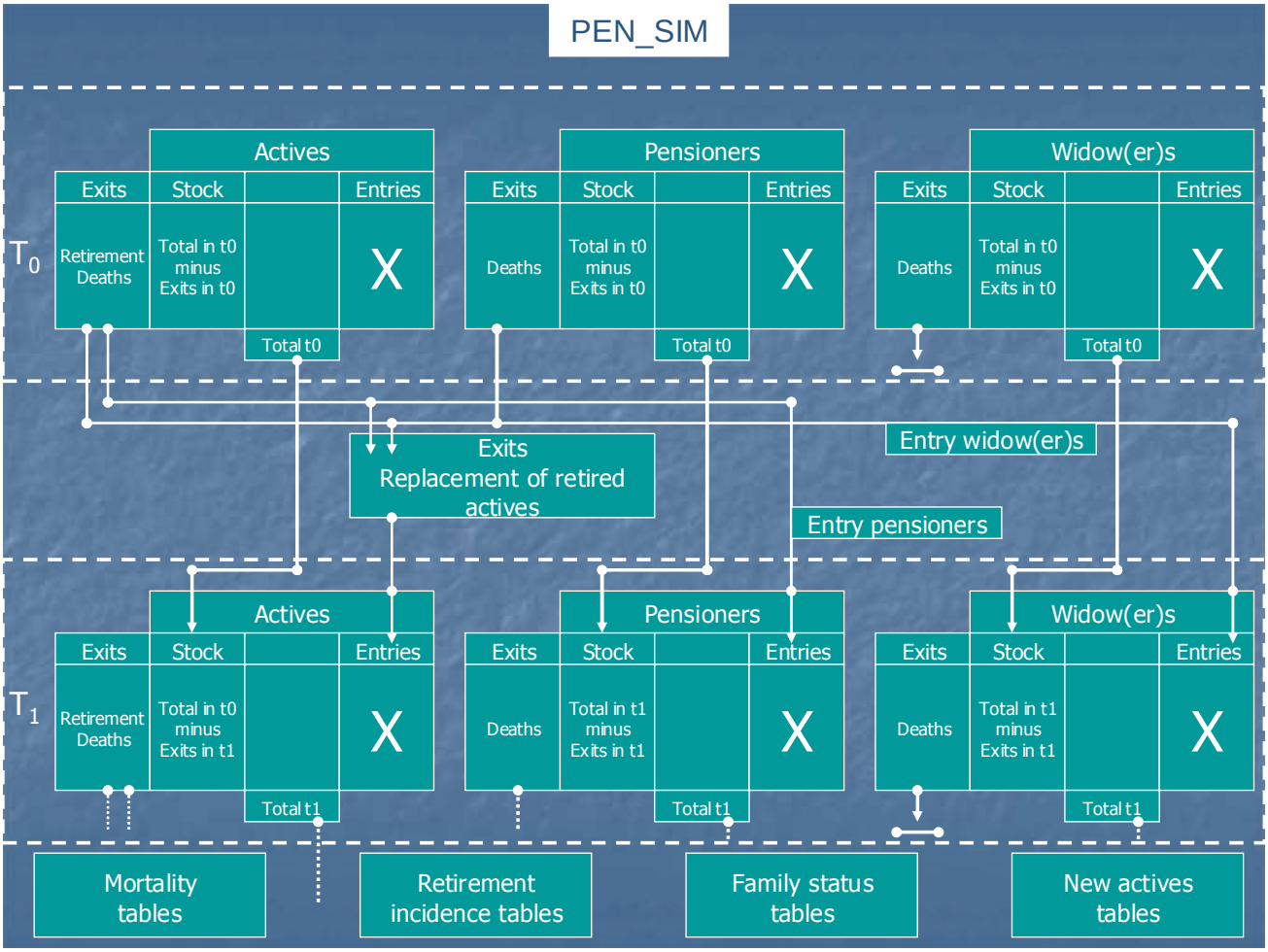
Module Four serves as a reference to the other three modules; it calculates the total population on the basis of fertility and mortality rates, taking into account exogenous assumptions on migration.

The data base is being published by the German Federal Statistical Office (Statistisches Bundesamt); migration assumptions make use of OECD data.

Chart 1 roughly reflects the flow of calculations projecting data from t to t+1. Calculations for t+2, t+3, …, t+n are analogous. As the deeply disaggrated data base is available only in 5-year-slices the projection steps are 5 years, also. Initial (annualized) population projection parameters are being grouped accordingly.

Interpolation techniques have been applied for purposes of the social budget calculations in order to produce single year outputs out of the 5 year grouped data / projection results. Given the long projection horizon of 70 years this approach is acceptable as it only marginally affects the required standards of precision and reliability of the calculations.

Chart 1. Model – sequence of calculations



Source: Adaptation of Harald Dalezios

Module One: Projection of civil servants

The projection of active civil servants is based on deeply structured analysis of the stock of civil servants by different government levels: federal government, states, municipalities, post and railways.

Types

Analysis is based on separate treatment of different "types" of cases according to administrative level / professional level / salary scale / working time /sex and age.

Table 1. Code of types under module one

Administrative level		Professional level		Salary scale		Working time		Sex		Age	
Federation	01	Civil servants and judges	01	Higher professionals	01	Full	01	All	03	-25	110
States	02	Officers and professional soldiers	02	Medium professionals	02	partial	02	Male	01	25 - 30	120
Municipalities	03	Employees	03	Lower professionals	03	Empty	00	Female	02	…	
Railways	04	Empty	00	Empty	00			Empty	00	90 – 95	250
Post	05									Empty	998
Empty	00									Total	999

Source: Harald Dalezios.

Mortality table

Life expectancy was calculated on the basis of the mortality tables of the German Federal Statistical Office. The rates of 2005 were taken as a basis for the life expectancy projections, which can be calculated on basis of linearly or exponentially changing mortality rates (or as a combination of both). For the social budget calculations, linear decrease of mortality rates was assumed.

Calculation of conditional mortality rates per 5 year age-group was calculated as indicated in table 2:

Table 2. Calculation of conditional mortality rates for a given 5 year age group

Age group 25 - 29	25	26	27	28	29	=> Σ deaths_0
	26	27	28	29	30	=> Σ deaths_1
	27	28	29	30	31	=> Σ deaths_2
	28	29	30	31	32	=> Σ deaths_3
	29	30	31	32	33	=> Σ deaths_4
Age group 30 – 34	30	31	32	33	34	=> Σ deaths_5
	=> Surving_1	=> Surving_2	=> Surving_3	=> Surving_4	=> Surving_5	=> Σ surviving => Σ deaths

Source: Harald Dalezios.

Retirement incidence tables

At retirement, the active civil servants are being transferred, by type, to module two. Retirement rates are based on empirical observation; account is taken of disability incidence rates and (changes in) legal retirement age.

The model allows for changes in the average retirement ages, including changes in the retirement ages by type.

Replacements of retired civil servants

Replacements substitute for retirement and deaths; it is assumed that replacement maintains the internal structure of the civil service (relative shares of types).

Remuneration (salaries)

Salaries by type are being projected on the basis of the average wages calculated in the economic module of the social budget model. Legally induced reductions of civil service salaries are being taken into account.

Module Two: Projection of pensioners

Analogous to methodology used for actives.

Remuneration (pensions)

Analogous to methodology used for actives.

Module Three: Projection of widow(er)s

Analogous to methodology used for actives and pensioners. Additionally, special account is taken of the probability to marry a (new) partner; also, “change in sex” takes place between actives / pensioners (dying) and widows / widowers surviving: whenever a married male active or pensioner dies, a female pensioner adds to the stock of widows, and vice versa.

Remuneration (widow(er)s pensions)

Analogous to methodology used for actives and pensioners.

Module Four: Population projection

The civil service model links with a general population projection model; for purposes of the social budget calculations the population model was adjusted to the same assumptions as made under the (UN) population projection model used by ILO-SECSOC. Any differences in actual projection outputs of the two models – which depend on internal programming differences, not on differences in modelling approach – were marginal and had no implication for the overall results of the social budget calculations.

Table Annex

Population

Table 1a: Population – total, deaths, births, migration, Baseline

Table 1b: Population – total, deaths, births, migration, Optimistic Scenario

Table 1c: Population – total, deaths, births, migration, Pessimistic Scenario

Table 1d: Population – male, female, Baseline

Table 1e: Population – male, female, Optimistic Scenario

Table 1f: Population – male, female, Pessimistic Scenario

Table 1g: Population – life expectancies, dependency ratios, all scenarios

Labour force, employment, working time and productivity

Table 2a: Labour force – total, male, female, participation rates, Baseline

Table 2b: Labour force – total, male, female, participation rates, Optimistic Scenario

Table 2c: Labour force – total, male, female, participation rates, Pessimistic Scenario

Table 2d: Labour force participation by age groups – male, female, Baseline

Table 2e: Labour force participation by age groups – male, female, Optimistic Scenario

Table 2f: Labour force participation by age groups – male, female, Pessimistic Scenario

Table 2g: Labour market balance, Baseline

Table 2h: Labour market balance, Optimistic Scenario

Table 2i: Labour market balance, Pessimistic Scenario

Table 2j: Working time, all scenarios

Table 2k: Productivity per hour worked and output per employed, all scenarios

National income

Table 3a: Real and nominal GDP, Baseline

Table 3b: Real and nominal GDP, Optimistic Scenario

Table 3c: Real and nominal GDP, Pessimistic Scenario

Table 3d: Primary income allocation, Baseline

Table 3e: Primary income allocation, Optimistic Scenario

Table 3f: Primary income allocation, Pessimistic Scenario

Social budget

Table 4a: Social budget by functions, revenue, balance, Baseline

Table 4b: Social budget by functions, revenue, balance, Optimistic Scenario

Table 4c: Social budget by functions, revenue, balance, Pessimistic Scenario

Table 4d: Social budget revenue by type, share in GDP, Baseline

Table 4e: Social budget revenue by type, share in GDP, Optimistic Scenario

Table 4f: Social budget revenue by type, share in GDP, Pessimistic Scenario

Table 4g: Beneficiaries and replacement rates, Baseline

Table 4h: Beneficiaries and replacement rates, Optimistic Scenario

Table 4i: Beneficiaries and replacement rates, Pessimistic Scenario

Table 4j: Hospital days, outpatient visits, medical supplies, Baseline

Table 4k: Hospital days, outpatient visits, medical supplies, Optimistic Scenario

Table 4l: Hospital days, outpatient visits, medical supplies, Pessimistic Scenario

Table 4m: Age-related health system utilization rates, male, Baseline

Table 4n: Contribution assessment ceilings and contribution rates, Baseline

Table 4o: Contribution assessment ceilings and contribution rates, Optimistic Scenario

Table 4p: Contribution assessment ceilings and contribution rates, Pessimistic Scenario

Table 4q: Social budget by age groups of population, Baseline

Table 4r: Social budget by age groups of population, Optimistic Scenario

Table 4s: Social budget by age groups of population, Pessimistic Scenario

Table1a. Population - Baseline

Year	Population	Deaths	Births	Net migration
	Million persons (cases)			
2007	82.3	0.9	0.7	0.09
2008	82.2	0.9	0.7	0.09
2009	82.2	0.9	0.7	0.10
2010	82.1	0.9	0.7	0.10
2011	82.0	0.9	0.7	0.10
2012	81.8	0.9	0.7	0.10
2013	81.7	0.9	0.7	0.10
2014	81.5	0.9	0.7	0.10
2015	81.4	0.9	0.6	0.10
2016	81.2	1.0	0.6	0.10
2017	81.0	1.0	0.6	0.10
2018	80.7	1.0	0.6	0.10
2019	80.5	1.0	0.6	0.10
2020	80.2	1.0	0.6	0.10
2021	80.0	1.0	0.6	0.10
2022	79.7	1.0	0.6	0.10
2023	79.5	1.0	0.6	0.10
2024	79.2	1.0	0.6	0.10
2025	79.0	1.0	0.6	0.10
2026	78.8	1.0	0.7	0.10
2027	78.6	1.0	0.7	0.10
2028	78.4	1.0	0.7	0.10
2029	78.2	1.0	0.7	0.10
2030	78.1	1.0	0.7	0.10
2031	77.9	1.0	0.7	0.10
2032	77.7	1.0	0.7	0.10
2033	77.5	1.0	0.7	0.10
2034	77.3	1.0	0.7	0.10
2035	77.1	1.0	0.7	0.10
2036	76.9	1.0	0.7	0.10
2037	76.6	1.0	0.7	0.10
2038	76.4	1.0	0.7	0.10
2039	76.1	1.0	0.6	0.10
2040	75.8	1.0	0.6	0.10
2041	75.6	1.0	0.6	0.10
2042	75.3	1.0	0.6	0.10
2043	75.0	1.0	0.6	0.10
2044	74.7	1.0	0.6	0.10
2045	74.4	1.1	0.6	0.10
2046	74.0	1.1	0.6	0.10
2047	73.7	1.1	0.6	0.10
2048	73.3	1.1	0.6	0.10
2049	72.9	1.1	0.6	0.10
2050	72.5	1.1	0.6	0.10
2051	72.1	1.1	0.6	0.10
2052	71.7	1.2	0.6	0.10
2053	71.3	1.2	0.6	0.10
2054	70.9	1.2	0.6	0.10
2055	70.5	1.2	0.7	0.10
2056	70.1	1.2	0.7	0.10
2057	69.6	1.2	0.7	0.10
2058	69.2	1.2	0.7	0.10
2059	68.8	1.1	0.7	0.10
2060	68.4	1.1	0.6	0.10
2061	68.1	1.1	0.6	0.10
2062	67.7	1.1	0.6	0.10
2063	67.3	1.1	0.6	0.10
2064	67.0	1.1	0.6	0.10
2065	66.6	1.1	0.6	0.10
2066	66.3	1.0	0.6	0.10
2067	66.0	1.0	0.6	0.10
2068	65.8	1.0	0.6	0.10
2069	65.5	1.0	0.6	0.10
2070	65.2	0.7	0.6	0.10

Table 1b. Population – Optimistic Scenario

Year	Population	Deaths	Births	Net migration
	Million persons (cases)			
2007	82.4	0.8	0.7	0.14
2008	82.4	0.8	0.7	0.16
2009	82.4	0.8	0.7	0.18
2010	82.4	0.9	0.7	0.20
2011	82.5	0.8	0.7	0.20
2012	82.5	0.9	0.7	0.20
2013	82.6	0.9	0.8	0.20
2014	82.7	0.9	0.8	0.20
2015	82.8	0.9	0.8	0.20
2016	82.9	0.9	0.9	0.20
2017	83.1	0.9	0.9	0.20
2018	83.2	0.9	0.9	0.20
2019	83.4	0.9	0.9	0.20
2020	83.6	1.0	1.0	0.20
2021	83.8	1.0	1.0	0.20
2022	84.0	1.0	1.0	0.20
2023	84.2	1.0	1.0	0.20
2024	84.4	1.0	1.0	0.20
2025	84.6	1.0	0.9	0.20
2026	84.7	1.0	0.9	0.20
2027	84.9	1.0	0.9	0.20
2028	85.0	1.0	0.9	0.20
2029	85.2	1.0	0.9	0.20
2030	85.3	1.0	0.9	0.20
2031	85.4	1.0	0.9	0.20
2032	85.5	1.0	0.9	0.20
2033	85.7	1.0	0.9	0.20
2034	85.8	1.0	0.9	0.20
2035	85.9	1.0	0.9	0.20
2036	86.0	1.0	0.9	0.20
2037	86.2	1.0	0.9	0.20
2038	86.3	1.0	0.9	0.20
2039	86.5	1.0	1.0	0.20
2040	86.7	1.0	1.0	0.20
2041	86.8	1.0	1.0	0.20
2042	87.0	1.0	1.0	0.20
2043	87.2	1.0	1.0	0.20
2044	87.4	1.0	1.0	0.20
2045	87.6	1.1	1.1	0.20
2046	87.9	1.1	1.1	0.20
2047	88.0	1.1	1.1	0.20
2048	88.2	1.1	1.1	0.20
2049	88.4	1.1	1.1	0.20
2050	88.5	1.2	1.1	0.20
2051	88.7	1.2	1.1	0.20
2052	88.8	1.2	1.1	0.20
2053	88.9	1.2	1.1	0.20
2054	89.0	1.2	1.1	0.20
2055	89.1	1.2	1.1	0.20
2056	89.3	1.2	1.1	0.20
2057	89.4	1.2	1.1	0.20
2058	89.5	1.2	1.1	0.20
2059	89.6	1.2	1.1	0.20
2060	89.8	1.2	1.1	0.20
2061	89.9	1.1	1.1	0.20
2062	90.1	1.1	1.1	0.20
2063	90.3	1.1	1.1	0.20
2064	90.5	1.1	1.1	0.20
2065	90.8	1.1	1.2	0.20
2066	91.1	1.1	1.2	0.20
2067	91.4	1.1	1.2	0.20
2068	91.7	1.0	1.2	0.20
2069	92.0	1.0	1.2	0.20
2070	92.4	1.4	1.2	0.20

Table 1c. Population – Pessimistic Scenario

Year	Population	Deaths	Births	Net migration
	Million persons (cases)			
2007	82.3	0.9	0.7	0.07
2008	82.1	0.9	0.7	0.06
2009	82.0	0.9	0.7	0.06
2010	81.9	0.9	0.7	0.05
2011	81.7	0.9	0.7	0.05
2012	81.5	0.9	0.7	0.05
2013	81.3	0.9	0.7	0.05
2014	81.1	0.9	0.6	0.05
2015	80.9	0.9	0.6	0.05
2016	80.6	1.0	0.6	0.05
2017	80.3	1.0	0.6	0.05
2018	80.0	1.0	0.6	0.05
2019	79.7	1.0	0.6	0.05
2020	79.4	1.0	0.6	0.05
2021	79.1	1.0	0.6	0.05
2022	78.7	1.0	0.6	0.05
2023	78.4	1.0	0.6	0.05
2024	78.0	1.0	0.6	0.05
2025	77.6	1.0	0.6	0.05
2026	77.2	1.0	0.5	0.05
2027	76.9	1.0	0.5	0.05
2028	76.5	1.0	0.5	0.05
2029	76.1	1.0	0.5	0.05
2030	75.7	1.0	0.5	0.05
2031	75.2	1.0	0.5	0.05
2032	74.8	1.0	0.5	0.05
2033	74.4	1.0	0.5	0.05
2034	73.9	1.0	0.5	0.05
2035	73.5	1.0	0.5	0.05
2036	73.0	1.0	0.5	0.05
2037	72.5	1.0	0.5	0.05
2038	72.1	1.0	0.5	0.05
2039	71.6	1.0	0.5	0.05
2040	71.1	1.0	0.5	0.05
2041	70.5	1.0	0.5	0.05
2042	70.0	1.0	0.4	0.05
2043	69.5	1.0	0.4	0.05
2044	68.9	1.1	0.4	0.05
2045	68.4	1.1	0.4	0.05
2046	67.8	1.1	0.4	0.05
2047	67.2	1.1	0.4	0.05
2048	66.5	1.1	0.4	0.05
2049	65.9	1.1	0.4	0.05
2050	65.2	1.1	0.4	0.05
2051	64.5	1.2	0.4	0.05
2052	63.8	1.2	0.4	0.05
2053	63.1	1.2	0.4	0.05
2054	62.4	1.2	0.4	0.05
2055	61.6	1.2	0.4	0.05
2056	60.9	1.2	0.4	0.05
2057	60.2	1.2	0.4	0.05
2058	59.4	1.1	0.4	0.05
2059	58.7	1.1	0.4	0.05
2060	58.0	1.1	0.4	0.05
2061	57.3	1.1	0.4	0.05
2062	56.6	1.1	0.3	0.05
2063	55.9	1.1	0.3	0.05
2064	55.2	1.1	0.3	0.05
2065	54.5	1.0	0.3	0.05
2066	53.9	1.0	0.3	0.05
2067	53.2	1.0	0.3	0.05
2068	52.6	1.0	0.3	0.05
2069	52.0	1.0	0.3	0.05
2070	51.4	0.4	0.3	0.05

Table 1d. Population - Baseline

Year	Male	Female	Male	Female
	Million		Index 2007 = 100	
2007	40.3	42.0	100.0	100.0
2008	40.3	41.9	99.9	99.9
2009	40.3	41.9	99.9	99.8
2010	40.2	41.8	99.8	99.6
2011	40.2	41.8	99.7	99.5
2012	40.1	41.7	99.5	99.3
2013	40.0	41.6	99.4	99.1
2014	40.0	41.6	99.2	99.0
2015	39.9	41.5	98.9	98.7
2016	39.8	41.4	98.7	98.5
2017	39.7	41.3	98.4	98.3
2018	39.6	41.2	98.1	98.0
2019	39.4	41.1	97.8	97.8
2020	39.3	40.9	97.5	97.5
2021	39.2	40.8	97.1	97.2
2022	39.0	40.7	96.8	96.9
2023	38.9	40.6	96.5	96.6
2024	38.8	40.5	96.2	96.3
2025	38.7	40.4	95.9	96.1
2026	38.6	40.2	95.7	95.8
2027	38.5	40.1	95.4	95.6
2028	38.4	40.0	95.2	95.3
2029	38.3	40.0	95.0	95.1
2030	38.2	39.9	94.8	94.9
2031	38.1	39.8	94.6	94.7
2032	38.0	39.7	94.4	94.4
2033	37.9	39.6	94.1	94.2
2034	37.8	39.5	93.9	94.0
2035	37.7	39.4	93.6	93.7
2036	37.6	39.2	93.3	93.4
2037	37.5	39.1	93.0	93.1
2038	37.4	39.0	92.7	92.8
2039	37.2	38.9	92.4	92.5
2040	37.1	38.7	92.1	92.2
2041	37.0	38.6	91.7	91.9
2042	36.8	38.5	91.3	91.6
2043	36.7	38.3	90.9	91.2
2044	36.5	38.2	90.5	90.9
2045	36.3	38.0	90.1	90.5
2046	36.1	37.9	89.7	90.2
2047	36.0	37.7	89.2	89.8
2048	35.8	37.5	88.7	89.4
2049	35.6	37.4	88.2	89.0
2050	35.4	37.2	87.7	88.5
2051	35.2	37.0	87.2	88.0
2052	34.9	36.8	86.7	87.6
2053	34.7	36.6	86.2	87.1
2054	34.5	36.4	85.7	86.6
2055	34.3	36.1	85.2	86.1
2056	34.1	35.9	84.7	85.6
2057	33.9	35.7	84.2	85.0
2058	33.7	35.5	83.7	84.5
2059	33.5	35.3	83.2	84.0
2060	33.4	35.1	82.8	83.5
2061	33.2	34.9	82.3	83.0
2062	33.0	34.7	81.9	82.6
2063	32.8	34.5	81.5	82.1
2064	32.7	34.3	81.1	81.7
2065	32.5	34.1	80.7	81.2
2066	32.4	33.9	80.4	80.8
2067	32.2	33.8	80.0	80.5
2068	32.1	33.6	79.7	80.1
2069	32.0	33.5	79.3	79.8
2070	31.9	33.4	79.0	79.4

Table 1e. Population - Optimistic Scenario

Year	Male	Female	Male	Female
	Million		Index 2007 = 100	
2007	40.3	42.0	100.0	100.0
2008	40.4	42.0	100.0	100.0
2009	40.4	42.0	100.1	100.0
2010	40.4	42.0	100.1	100.0
2011	40.4	42.0	100.2	100.0
2012	40.5	42.1	100.3	100.0
2013	40.5	42.1	100.4	100.1
2014	40.5	42.1	100.5	100.2
2015	40.6	42.2	100.6	100.3
2016	40.7	42.2	100.8	100.5
2017	40.7	42.3	101.0	100.7
2018	40.8	42.4	101.2	100.9
2019	40.9	42.5	101.4	101.1
2020	41.0	42.6	101.6	101.4
2021	41.1	42.7	101.9	101.6
2022	41.2	42.8	102.1	101.9
2023	41.3	42.9	102.3	102.1
2024	41.4	43.0	102.6	102.3
2025	41.5	43.1	102.8	102.5
2026	41.6	43.2	103.0	102.7
2027	41.6	43.2	103.2	102.9
2028	41.7	43.3	103.4	103.0
2029	41.8	43.4	103.6	103.2
2030	41.9	43.4	103.7	103.3
2031	41.9	43.5	103.9	103.4
2032	42.0	43.5	104.1	103.6
2033	42.1	43.6	104.2	103.7
2034	42.1	43.7	104.4	103.9
2035	42.2	43.7	104.5	104.0
2036	42.2	43.8	104.7	104.1
2037	42.3	43.9	104.9	104.3
2038	42.4	43.9	105.1	104.5
2039	42.5	44.0	105.3	104.7
2040	42.6	44.1	105.5	104.9
2041	42.6	44.2	105.7	105.1
2042	42.7	44.3	105.9	105.4
2043	42.8	44.4	106.1	105.6
2044	42.9	44.5	106.4	105.9
2045	43.0	44.6	106.6	106.2
2046	43.1	44.8	106.8	106.4
2047	43.2	44.9	107.0	106.7
2048	43.3	45.0	107.2	106.9
2049	43.3	45.0	107.4	107.1
2050	43.4	45.1	107.6	107.3
2051	43.5	45.2	107.7	107.5
2052	43.5	45.3	107.9	107.7
2053	43.6	45.3	108.0	107.8
2054	43.6	45.4	108.1	108.0
2055	43.7	45.4	108.3	108.1
2056	43.8	45.5	108.4	108.2
2057	43.8	45.6	108.6	108.4
2058	43.9	45.6	108.8	108.5
2059	44.0	45.7	108.9	108.6
2060	44.0	45.7	109.1	108.8
2061	44.1	45.8	109.4	109.0
2062	44.2	45.9	109.6	109.1
2063	44.3	46.0	109.9	109.4
2064	44.5	46.1	110.2	109.6
2065	44.6	46.2	110.5	109.9
2066	44.7	46.3	110.9	110.2
2067	44.9	46.5	111.2	110.5
2068	45.0	46.6	111.6	110.9
2069	45.2	46.8	112.1	111.3
2070	45.4	47.0	112.5	111.7

Table 1f. Population - Pessimistic Scenario

Year	Male	Female	Male	Female
	Million		Index 2007 = 100	
2007	40.3	42.0	100.0	100.0
2008	40.2	41.9	99.9	99.8
2009	40.2	41.8	99.8	99.7
2010	40.1	41.8	99.6	99.5
2011	40.0	41.7	99.4	99.2
2012	40.0	41.6	99.2	99.0
2013	39.9	41.5	99.0	98.8
2014	39.8	41.3	98.7	98.5
2015	39.6	41.2	98.4	98.2
2016	39.5	41.1	98.1	97.9
2017	39.4	41.0	97.7	97.6
2018	39.2	40.8	97.3	97.3
2019	39.0	40.7	96.9	96.9
2020	38.9	40.5	96.5	96.5
2021	38.7	40.4	96.1	96.2
2022	38.5	40.2	95.6	95.8
2023	38.3	40.0	95.2	95.3
2024	38.2	39.8	94.7	94.9
2025	38.0	39.7	94.2	94.5
2026	37.8	39.5	93.8	94.0
2027	37.6	39.3	93.3	93.5
2028	37.4	39.1	92.8	93.1
2029	37.2	38.9	92.3	92.6
2030	37.0	38.7	91.8	92.1
2031	36.8	38.4	91.3	91.6
2032	36.6	38.2	90.8	91.1
2033	36.4	38.0	90.3	90.6
2034	36.1	37.8	89.7	90.0
2035	35.9	37.6	89.2	89.5
2036	35.7	37.3	88.6	88.9
2037	35.4	37.1	88.0	88.4
2038	35.2	36.9	87.4	87.8
2039	35.0	36.6	86.8	87.2
2040	34.7	36.4	86.1	86.6
2041	34.4	36.1	85.5	86.0
2042	34.2	35.8	84.8	85.4
2043	33.9	35.6	84.1	84.8
2044	33.6	35.3	83.4	84.1
2045	33.3	35.1	82.7	83.5
2046	33.0	34.8	81.9	82.8
2047	32.7	34.5	81.2	82.1
2048	32.4	34.2	80.3	81.4
2049	32.0	33.9	79.5	80.6
2050	31.7	33.5	78.7	79.9
2051	31.3	33.2	77.8	79.0
2052	31.0	32.8	76.9	78.2
2053	30.6	32.5	76.0	77.4
2054	30.3	32.1	75.1	76.5
2055	29.9	31.7	74.2	75.6
2056	29.5	31.4	73.3	74.7
2057	29.2	31.0	72.4	73.8
2058	28.8	30.6	71.5	72.9
2059	28.5	30.2	70.7	72.0
2060	28.1	29.9	69.8	71.1
2061	27.8	29.5	69.0	70.2
2062	27.4	29.1	68.1	69.3
2063	27.1	28.7	67.3	68.5
2064	26.8	28.4	66.5	67.6
2065	26.5	28.0	65.7	66.8
2066	26.2	27.7	64.9	66.0
2067	25.9	27.4	64.2	65.2
2068	25.6	27.1	63.4	64.5
2069	25.3	26.8	62.7	63.7
2070	25.0	26.4	62.0	63.0

Table1g. Population

Year	Life expectancy				Dependency ratio (Y =: Young; O =: Old; Y&O =: Young and Old)								
	At birth		At age 65		Baseline			Optimistic scenario			Pessimistic scenario		
	M	F	M	F	Y	Y&O	O	Y	Y&O	O	Y	Y&O	O
	Life-years				%								
2007	76.4	82.4	16.1	20.0	32.3	65.1	32.8	32.3	65.0	32.7	32.3	65.1	32.8
2008	76.6	82.6	16.2	20.1	31.7	64.9	33.2	31.7	64.8	33.1	31.7	64.9	33.2
2009	76.7	82.7	16.2	20.2	31.1	64.7	33.6	31.1	64.5	33.4	31.1	64.8	33.7
2010	76.8	82.9	16.3	20.3	30.5	64.1	33.6	30.5	63.9	33.4	30.5	64.2	33.7
2011	76.9	83.0	16.4	20.4	29.9	63.4	33.5	29.9	63.1	33.2	29.9	63.5	33.6
2012	77.0	83.2	16.5	20.5	29.5	63.1	33.6	29.7	62.9	33.3	29.5	63.3	33.8
2013	77.2	83.3	16.5	20.6	29.2	63.2	33.9	29.6	63.1	33.5	29.2	63.4	34.1
2014	77.3	83.4	16.6	20.7	29.1	63.5	34.4	29.7	63.6	34.0	29.0	63.7	34.7
2015	77.4	83.6	16.7	20.8	29.0	64.0	35.1	29.9	64.4	34.5	28.9	64.3	35.3
2016	77.5	83.7	16.8	20.9	28.8	64.5	35.7	30.2	65.3	35.1	28.8	64.8	36.0
2017	77.6	83.8	16.9	21.0	28.6	64.9	36.3	30.5	66.1	35.6	28.6	65.3	36.7
2018	77.8	83.9	16.9	21.1	28.4	65.4	37.0	30.8	67.0	36.1	28.3	65.7	37.4
2019	77.9	84.1	17.0	21.2	28.2	65.9	37.6	31.3	68.0	36.7	28.1	66.2	38.1
2020	78.0	84.2	17.1	21.3	28.1	66.4	38.3	31.9	69.2	37.3	28.0	66.8	38.8
2021	78.2	84.3	17.3	21.4	28.0	67.1	39.1	32.6	70.6	38.0	27.9	67.5	39.7
2022	78.5	84.5	17.4	21.5	28.0	68.0	40.0	33.3	72.1	38.8	27.8	68.4	40.6
2023	78.7	84.6	17.6	21.6	28.1	69.1	41.0	34.0	73.7	39.6	27.8	69.4	41.7
2024	79.0	84.7	17.8	21.7	28.3	70.4	42.1	34.8	75.4	40.6	27.8	70.6	42.9
2025	79.3	84.9	18.0	21.8	28.5	71.9	43.4	35.7	77.4	41.7	27.8	72.0	44.2
2026	79.5	85.0	18.1	21.8	28.9	73.7	44.8	36.6	79.6	43.0	27.9	73.6	45.8
2027	79.7	85.1	18.2	21.9	29.2	75.6	46.4	37.5	81.9	44.4	27.9	75.4	47.4
2028	80.0	85.2	18.4	22.0	29.6	77.7	48.1	38.4	84.3	45.9	28.0	77.3	49.2
2029	80.2	85.4	18.5	22.1	30.1	80.0	49.9	39.4	86.8	47.4	28.2	79.3	51.2
2030	80.5	85.5	18.7	22.2	30.6	82.3	51.7	40.3	89.4	49.0	28.3	81.4	53.2
2031	80.7	85.6	18.8	22.3	31.2	84.7	53.5	41.2	91.8	50.6	28.4	83.5	55.1
2032	80.8	85.8	18.9	22.4	31.7	87.0	55.3	42.0	94.0	52.0	28.5	85.6	57.1
2033	81.0	85.9	19.0	22.5	32.2	89.2	57.0	42.7	96.0	53.3	28.5	87.5	59.0
2034	81.1	86.0	19.1	22.5	32.7	91.3	58.6	43.2	97.6	54.4	28.6	89.3	60.7
2035	81.3	86.1	19.2	22.6	33.2	93.1	59.9	43.6	98.8	55.2	28.6	90.8	62.2
2036	81.5	86.3	19.4	22.7	33.6	94.5	61.0	43.9	99.6	55.7	28.6	92.0	63.4
2037	81.6	86.4	19.5	22.8	33.9	95.7	61.8	44.0	99.9	56.0	28.5	92.9	64.4
2038	81.8	86.5	19.6	22.9	34.2	96.4	62.2	43.9	99.7	55.8	28.4	93.3	64.9
2039	81.9	86.6	19.7	23.0	34.5	96.9	62.4	43.8	99.2	55.4	28.2	93.5	65.3
2040	82.1	86.8	19.8	23.1	34.8	97.4	62.6	43.6	98.6	55.0	28.1	93.7	65.6
2041	82.2	86.9	19.9	23.2	35.1	97.8	62.8	43.4	98.0	54.6	28.0	93.9	65.9
2042	82.4	87.0	19.9	23.3	35.3	98.3	63.0	43.3	97.6	54.3	27.8	94.2	66.3
2043	82.5	87.1	20.0	23.5	35.5	98.8	63.3	43.3	97.3	54.0	27.8	94.6	66.8
2044	82.7	87.3	20.1	23.6	35.7	99.3	63.5	43.4	97.2	53.8	27.7	95.0	67.3
2045	82.8	87.4	20.1	23.7	35.9	99.9	63.9	43.6	97.2	53.7	27.7	95.6	68.0
2046	82.9	87.5	20.3	23.8	36.1	100.5	64.4	43.8	97.5	53.6	27.7	96.4	68.7
2047	83.1	87.6	20.4	23.9	36.3	101.0	64.7	44.1	97.7	53.6	27.7	97.0	69.4
2048	83.2	87.8	20.5	24.0	36.4	101.3	64.9	44.5	97.9	53.5	27.7	97.6	69.9
2049	83.4	87.9	20.6	24.1	36.5	101.5	65.0	44.8	98.1	53.3	27.7	98.1	70.4
2050	83.5	88.0	20.7	24.2	36.5	101.5	65.0	45.2	98.3	53.1	27.7	98.4	70.7
2051	83.6	88.1	20.8	24.3	36.6	101.6	65.0	45.6	98.5	52.9	27.7	98.9	71.2
2052	83.7	88.3	20.9	24.4	36.7	101.8	65.1	46.1	98.9	52.8	27.8	99.4	71.6
2053	83.9	88.4	21.0	24.5	36.9	102.2	65.3	46.5	99.2	52.7	27.8	100.0	72.2
2054	84.0	88.5	21.1	24.6	37.1	102.5	65.4	47.0	99.6	52.6	27.9	100.7	72.7
2055	84.1	88.7	21.3	24.7	37.3	102.8	65.5	47.4	99.9	52.5	28.0	101.2	73.3
2056	84.2	88.8	21.4	24.8	37.5	103.0	65.4	47.7	99.9	52.2	28.0	101.6	73.6
2057	84.3	88.9	21.5	24.9	37.7	102.8	65.1	48.0	99.7	51.7	28.0	101.7	73.6
2058	84.5	89.0	21.6	25.0	37.9	102.6	64.7	48.1	99.3	51.2	28.0	101.6	73.5
2059	84.6	89.2	21.7	25.1	38.1	102.2	64.2	48.2	98.8	50.5	28.0	101.3	73.3
2060	84.7	89.3	21.8	25.3	38.2	101.8	63.6	48.3	98.1	49.8	28.0	101.0	73.1
2061	84.8	89.4	21.9	25.4	38.4	101.5	63.1	48.3	97.4	49.2	28.0	100.8	72.9
2062	84.8	89.5	22.1	25.5	38.6	101.3	62.7	48.3	96.8	48.6	28.0	100.8	72.9
2063	84.9	89.7	22.2	25.6	38.8	101.2	62.4	48.2	96.2	48.0	28.0	100.9	72.9
2064	84.9	89.8	22.3	25.7	39.0	101.0	62.0	48.1	95.5	47.3	28.0	100.9	72.9
2065	85.0	89.9	22.4	25.8	39.2	100.8	61.6	48.0	94.7	46.7	28.0	100.9	72.9
2066	85.0	89.9	22.5	25.9	39.3	100.5	61.2	47.9	94.0	46.1	28.0	100.9	72.9
2067	85.0	89.9	22.6	26.0	39.4	100.2	60.7	47.8	93.1	45.4	28.0	100.8	72.9
2068	85.0	90.0	22.6	26.0	39.5	99.7	60.2	47.6	92.3	44.7	28.0	100.7	72.8
2069	85.0	90.0	22.6	26.0	39.6	99.3	59.7	47.4	91.5	44.0	27.9	100.7	72.7
2070	85.0	90.0	22.6	26.0	39.6	98.8	59.2	47.3	90.6	43.4	27.9	100.6	72.7

Table 2a. Labour Force – Baseline

Year	Total Labour Force			Participation Rate		
	Total	Male	Female	Total	Male	Female
	Million persons			%		
2007	42.5	23.1	19.4	77.5	82.6	71.4
2008	42.6	23.1	19.4	77.8	82.8	71.8
2009	42.6	23.1	19.5	78.0	83.0	72.1
2010	42.6	23.1	19.5	78.1	83.0	72.3
2011	42.6	23.0	19.5	78.1	83.0	72.4
2012	42.5	23.0	19.5	78.1	82.9	72.4
2013	42.5	22.9	19.5	78.1	82.9	72.5
2014	42.3	22.9	19.5	78.2	82.9	72.7
2015	42.2	22.8	19.4	78.3	82.9	72.8
2016	42.0	22.6	19.4	78.4	82.9	73.0
2017	41.8	22.5	19.3	78.4	82.9	73.2
2018	41.6	22.4	19.2	78.5	82.9	73.4
2019	41.3	22.2	19.1	78.6	82.9	73.5
2020	41.0	22.0	19.0	78.6	82.8	73.6
2021	40.7	21.8	18.9	78.6	82.8	73.7
2022	40.4	21.6	18.7	78.6	82.8	73.8
2023	40.0	21.4	18.6	78.6	82.7	73.8
2024	39.6	21.2	18.4	78.6	82.7	73.9
2025	39.2	21.0	18.3	78.6	82.6	74.0
2026	38.8	20.7	18.1	78.7	82.7	74.1
2027	38.4	20.5	17.9	78.8	82.8	74.4
2028	38.0	20.3	17.7	79.0	82.9	74.6
2029	37.6	20.0	17.6	79.3	83.1	75.0
2030	37.2	19.8	17.4	79.6	83.3	75.4
2031	36.7	19.5	17.2	79.7	83.4	75.5
2032	36.3	19.3	17.0	79.9	83.6	75.8
2033	35.9	19.1	16.9	80.2	83.8	76.0
2034	35.6	18.9	16.7	80.4	84.1	76.3
2035	35.3	18.7	16.6	80.7	84.3	76.6
2036	35.0	18.5	16.4	80.8	84.4	76.7
2037	34.7	18.3	16.3	80.8	84.5	76.8
2038	34.4	18.2	16.2	80.8	84.4	76.7
2039	34.2	18.1	16.1	80.6	84.2	76.6
2040	33.9	17.9	16.0	80.5	84.0	76.4
2041	33.7	17.8	15.9	80.2	83.8	76.2
2042	33.4	17.6	15.8	80.0	83.6	76.0
2043	33.2	17.5	15.6	79.8	83.4	75.8
2044	32.9	17.4	15.5	79.7	83.3	75.6
2045	32.7	17.3	15.4	79.5	83.1	75.5
2046	32.4	17.1	15.3	79.4	83.0	75.3
2047	32.2	17.0	15.2	79.3	82.9	75.2
2048	32.0	16.9	15.1	79.2	82.8	75.2
2049	31.7	16.8	15.0	79.1	82.6	75.1
2050	31.5	16.6	14.9	79.0	82.6	75.0
2051	31.3	16.5	14.8	79.0	82.5	75.0
2052	31.1	16.4	14.7	79.0	82.6	75.0
2053	30.9	16.3	14.6	79.1	82.7	75.1
2054	30.8	16.2	14.5	79.2	82.8	75.3
2055	30.6	16.1	14.5	79.4	82.9	75.4
2056	30.4	16.0	14.4	79.5	83.0	75.5
2057	30.3	16.0	14.3	79.5	83.1	75.6
2058	30.1	15.9	14.3	79.5	83.1	75.6
2059	30.0	15.8	14.2	79.6	83.1	75.6
2060	29.9	15.7	14.1	79.6	83.1	75.6
2061	29.8	15.7	14.1	79.6	83.2	75.6
2062	29.7	15.6	14.0	79.6	83.2	75.7
2063	29.6	15.6	14.0	79.7	83.3	75.7
2064	29.5	15.5	14.0	79.8	83.3	75.8
2065	29.4	15.5	13.9	79.8	83.4	75.8
2066	29.3	15.4	13.9	79.8	83.4	75.9
2067	29.3	15.4	13.9	79.9	83.4	75.9
2068	29.2	15.4	13.8	79.9	83.5	75.9
2069	29.2	15.3	13.8	79.9	83.5	75.9
2070	29.1	15.3	13.8	79.9	83.5	75.9

Table 2b. Labour f0rce – Optimistic Scenario

Year	Total Labour Force			Participation Rate		
	Total	Male	Female	Total	Male	Female
	Million persons			%		
2007	42.6	23.1	19.4	77.5	82.6	71.4
2008	42.7	23.2	19.5	77.8	82.8	71.8
2009	42.8	23.2	19.6	78.0	83.0	72.1
2010	42.8	23.2	19.6	78.1	83.1	72.3
2011	42.9	23.2	19.7	78.1	83.0	72.4
2012	43.0	23.2	19.7	78.2	83.0	72.5
2013	43.0	23.2	19.8	78.2	83.0	72.6
2014	42.9	23.2	19.8	78.3	83.0	72.8
2015	42.8	23.1	19.7	78.4	83.0	73.0
2016	42.8	23.0	19.7	78.5	83.1	73.2
2017	42.6	22.9	19.7	78.6	83.1	73.4
2018	42.5	22.8	19.7	78.7	83.1	73.6
2019	42.3	22.7	19.6	78.8	83.1	73.7
2020	42.2	22.6	19.6	78.8	83.1	73.9
2021	41.9	22.5	19.5	78.8	83.1	74.0
2022	41.7	22.3	19.4	78.9	83.0	74.1
2023	41.4	22.1	19.3	78.9	83.0	74.1
2024	41.1	22.0	19.1	78.9	82.9	74.2
2025	40.8	21.8	19.0	78.9	82.9	74.3
2026	40.5	21.6	18.9	79.0	83.0	74.5
2027	40.2	21.4	18.8	79.1	83.0	74.7
2028	39.9	21.2	18.7	79.2	83.0	74.9
2029	39.6	21.0	18.6	79.3	83.1	75.1
2030	39.4	20.9	18.5	79.5	83.2	75.3
2031	39.2	20.7	18.4	79.5	83.1	75.4
2032	38.9	20.6	18.3	79.5	83.1	75.5
2033	38.8	20.5	18.3	79.5	83.1	75.6
2034	38.7	20.4	18.3	79.6	83.1	75.7
2035	38.7	20.4	18.3	79.6	83.1	75.8
2036	38.7	20.4	18.3	79.6	83.0	75.8
2037	38.7	20.4	18.3	79.6	83.0	75.8
2038	38.8	20.4	18.4	79.5	82.8	75.8
2039	38.9	20.4	18.5	79.4	82.7	75.7
2040	38.9	20.4	18.5	79.3	82.6	75.6
2041	39.0	20.4	18.6	79.2	82.5	75.6
2042	39.1	20.5	18.6	79.2	82.5	75.5
2043	39.1	20.5	18.6	79.1	82.4	75.4
2044	39.2	20.5	18.7	79.1	82.5	75.4
2045	39.3	20.5	18.7	79.1	82.5	75.4
2046	39.3	20.6	18.7	79.2	82.6	75.4
2047	39.3	20.6	18.7	79.2	82.6	75.4
2048	39.3	20.6	18.7	79.2	82.6	75.4
2049	39.3	20.6	18.8	79.2	82.6	75.4
2050	39.4	20.6	18.8	79.1	82.6	75.3
2051	39.4	20.6	18.8	79.2	82.6	75.3
2052	39.5	20.7	18.8	79.2	82.7	75.4
2053	39.5	20.7	18.8	79.3	82.8	75.4
2054	39.6	20.7	18.9	79.4	82.9	75.5
2055	39.7	20.8	18.9	79.5	83.0	75.6
2056	39.8	20.9	19.0	79.5	83.1	75.6
2057	40.0	20.9	19.1	79.5	83.1	75.7
2058	40.2	21.0	19.1	79.5	83.0	75.6
2059	40.4	21.1	19.2	79.5	83.0	75.6
2060	40.6	21.2	19.4	79.5	83.0	75.6
2061	40.8	21.4	19.5	79.5	83.0	75.7
2062	41.1	21.5	19.6	79.5	83.0	75.7
2063	41.3	21.6	19.7	79.6	83.1	75.8
2064	41.6	21.8	19.9	79.7	83.1	75.9
2065	41.9	21.9	20.0	79.8	83.2	76.0
2066	42.3	22.1	20.2	79.8	83.3	76.1
2067	42.6	22.2	20.3	79.9	83.3	76.2
2068	42.9	22.4	20.5	80.0	83.4	76.2
2069	43.3	22.6	20.7	80.0	83.4	76.3
2070	43.6	22.8	20.8	80.1	83.5	76.4

Table 2c. Labour force - Pessimistic Scenario

Year	Total Labour Force			Participation Rate		
	Total	Male	Female	Total	Male	Female
	Million persons			%		
2007	42.5	23.1	19.4	77.5	82.6	71.4
2008	42.5	23.1	19.4	77.8	82.8	71.8
2009	42.5	23.0	19.4	78.0	83.0	72.1
2010	42.4	23.0	19.4	78.1	83.0	72.3
2011	42.4	23.0	19.4	78.1	82.9	72.3
2012	42.3	22.9	19.4	78.1	82.9	72.4
2013	42.2	22.8	19.4	78.1	82.9	72.5
2014	42.0	22.7	19.3	78.2	82.9	72.6
2015	41.8	22.6	19.3	78.2	82.9	72.8
2016	41.6	22.4	19.2	78.3	82.9	72.9
2017	41.4	22.3	19.1	78.4	82.9	73.1
2018	41.1	22.1	19.0	78.4	82.9	73.3
2019	40.8	21.9	18.9	78.5	82.8	73.4
2020	40.5	21.7	18.7	78.5	82.7	73.5
2021	40.1	21.5	18.6	78.5	82.7	73.6
2022	39.7	21.3	18.4	78.4	82.6	73.6
2023	39.3	21.1	18.3	78.4	82.6	73.7
2024	38.9	20.8	18.1	78.4	82.5	73.7
2025	38.4	20.6	17.9	78.5	82.5	73.8
2026	38.0	20.3	17.7	78.5	82.5	74.0
2027	37.5	20.0	17.5	78.7	82.6	74.2
2028	37.1	19.8	17.3	78.9	82.7	74.4
2029	36.6	19.5	17.1	79.1	82.9	74.8
2030	36.2	19.3	16.9	79.4	83.2	75.2
2031	35.7	19.0	16.7	79.6	83.3	75.3
2032	35.2	18.7	16.5	79.8	83.5	75.5
2033	34.7	18.5	16.3	80.0	83.7	75.8
2034	34.3	18.3	16.1	80.3	84.0	76.1
2035	34.0	18.0	15.9	80.5	84.2	76.3
2036	33.6	17.8	15.7	80.7	84.3	76.5
2037	33.2	17.6	15.6	80.7	84.4	76.6
2038	32.9	17.5	15.4	80.7	84.4	76.6
2039	32.6	17.3	15.3	80.7	84.3	76.5
2040	32.3	17.1	15.1	80.6	84.2	76.4
2041	31.9	16.9	15.0	80.4	84.1	76.3
2042	31.6	16.7	14.8	80.3	84.0	76.1
2043	31.2	16.6	14.6	80.2	83.9	76.0
2044	30.8	16.4	14.5	80.1	83.9	75.9
2045	30.5	16.2	14.3	80.1	83.9	75.9
2046	30.1	16.0	14.1	80.1	83.8	75.8
2047	29.7	15.8	13.9	80.1	83.8	75.8
2048	29.3	15.6	13.8	80.0	83.7	75.8
2049	28.9	15.4	13.6	79.9	83.6	75.7
2050	28.6	15.2	13.4	79.8	83.5	75.6
2051	28.2	15.0	13.2	79.8	83.5	75.6
2052	27.8	14.8	13.1	79.8	83.5	75.6
2053	27.5	14.6	12.9	79.9	83.6	75.7
2054	27.1	14.4	12.7	80.0	83.7	75.8
2055	26.8	14.2	12.6	80.1	83.8	75.9
2056	26.4	14.0	12.4	80.2	83.9	76.0
2057	26.1	13.9	12.3	80.2	83.9	76.0
2058	25.8	13.7	12.1	80.1	83.8	76.0
2059	25.5	13.5	12.0	80.1	83.8	75.9
2060	25.2	13.4	11.8	80.1	83.8	75.9
2061	24.9	13.2	11.7	80.0	83.7	75.9
2062	24.6	13.0	11.6	80.1	83.8	75.9
2063	24.3	12.9	11.4	80.1	83.8	76.0
2064	24.0	12.7	11.3	80.2	83.8	76.0
2065	23.7	12.6	11.2	80.2	83.9	76.0
2066	23.5	12.4	11.0	80.2	83.9	76.1
2067	23.2	12.3	10.9	80.2	83.9	76.1
2068	22.9	12.1	10.8	80.2	83.9	76.1
2069	22.7	12.0	10.7	80.2	83.9	76.1
2070	22.4	11.9	10.5	80.2	83.9	76.0

Table 2d. Labour force participation by age groups - Baseline

Age	Male								Female							
	2007		2030		2050		2070		2007		2050		2070			
	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%
15-19	0.88	36.4	0.61	36.0	0.63	36.0	0.60	36.0	0.69	30.1	0.54	33.0	0.56	33.0	0.53	33.0
20-24	1.98	80.8	1.36	76.0	1.36	76.0	1.27	76.0	1.80	75.8	1.36	76.5	1.36	76.5	1.28	76.5
25-29	2.22	88.6	1.73	88.3	1.53	88.3	1.53	88.3	2.04	83.2	1.63	83.3	1.47	83.3	1.47	83.3
30-34	2.31	95.3	2.13	98.0	1.73	98.0	1.80	98.0	1.90	80.8	1.87	86.0	1.54	86.0	1.60	86.0
35-39	3.09	96.7	2.29	99.2	1.86	99.2	1.92	99.2	2.51	82.5	1.97	86.0	1.62	86.0	1.67	86.0
40-44	3.55	96.0	2.57	98.0	1.90	98.0	1.91	98.0	3.00	85.6	2.28	89.0	1.72	89.0	1.72	89.0
45-49	3.21	95.1	2.52	98.0	2.00	98.0	1.79	98.0	2.77	85.1	2.22	88.0	1.76	88.0	1.58	88.0
50-54	2.64	91.5	2.31	94.3	2.06	94.3	1.69	94.3	2.29	80.1	2.19	93.0	1.99	93.0	1.64	93.0
55-59	2.12	82.2	2.28	90.7	2.04	90.7	1.66	90.7	1.73	66.2	1.97	81.0	1.80	81.0	1.48	81.0
60-64	0.83	39.4	1.60	50.0	1.23	50.0	0.92	50.0	0.50	22.7	1.20	38.0	0.93	38.0	0.70	38.0
65-69	0.19	7.3	0.25	8.0	0.19	8.0	0.15	8.0	0.12	4.2	0.14	4.2	0.10	4.2	0.08	4.2
70-74	0.07	3.7	0.09	3.7	0.08	3.7	0.07	3.7	0.03	1.5	0.04	1.5	0.03	1.5	0.03	1.5
75-79	0.02	1.6	0.03	1.6	0.03	1.6	0.03	1.6	0.01	0.5	0.01	0.5	0.01	0.5	0.01	0.5
Total	23.11	57.3	19.78	51.8	16.63	47.0	15.32	48.1	19.39	46.2	17.42	43.7	14.89	40.1	13.80	41.3

Row "Total": Participation rate as percentage of labour force of total male / female population

Columns "%": Participation rate as percentage of labour force in that age category for each gender

Table 2e. Labour force participation by age groups - Optimistic Scenario

Age	Male								Female							
	2007		2030		2050		2070		2007		2050		2070			
	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%
15-19	0.88	36.4	0.72	36.0	0.85	36.0	1.02	36.0	0.69	30.1	0.65	33.0	0.76	33.0	0.91	33.0
20-24	1.99	80.8	1.42	76.0	1.87	76.0	2.19	76.0	1.82	75.8	1.46	76.5	1.90	76.5	2.21	76.5
25-29	2.23	88.6	1.83	88.3	2.39	88.3	2.54	88.3	2.06	83.2	1.80	83.3	2.32	83.3	2.47	83.3
30-34	2.32	95.3	2.29	98.0	2.65	98.0	2.73	98.0	1.90	80.8	2.08	86.0	2.40	86.0	2.47	86.0
35-39	3.09	96.7	2.48	99.2	2.35	99.2	2.70	99.2	2.51	82.5	2.19	86.0	2.10	86.0	2.38	86.0
40-44	3.55	96.0	2.76	98.0	2.14	98.0	2.72	98.0	3.00	85.6	2.47	89.0	1.98	89.0	2.48	89.0
45-49	3.21	95.1	2.68	98.0	2.22	98.0	2.83	98.0	2.77	85.1	2.32	88.0	1.98	88.0	2.53	88.0
50-54	2.64	91.5	2.40	94.3	2.27	94.3	2.61	94.3	2.29	80.1	2.22	93.0	2.21	93.0	2.55	93.0
55-59	2.12	82.2	2.33	90.7	2.23	90.7	2.13	90.7	1.73	66.2	1.96	81.0	1.98	81.0	1.90	81.0
60-64	0.83	39.4	1.61	50.0	1.33	50.0	1.04	50.0	0.50	22.7	1.18	38.0	1.00	38.0	0.80	38.0
65-69	0.19	7.3	0.25	8.0	0.20	8.0	0.16	8.0	0.12	4.2	0.14	4.2	0.10	4.2	0.09	4.2
70-74	0.07	3.7	0.09	3.7	0.08	3.7	0.08	3.7	0.03	1.5	0.04	1.5	0.03	1.5	0.03	1.5
75-79	0.02	1.6	0.03	1.6	0.03	1.6	0.03	1.6	0.01	0.5	0.01	0.5	0.01	0.5	0.01	0.5
Total	23.14	57.4	20.90	49.9	20.60	47.5	22.78	50.2	19.42	46.2	18.53	42.7	18.77	41.6	20.82	44.3

Row "Total": Participation rate as percentage of labour force of total male / female population

Columns "%": Participation rate as percentage of labour force in that age category for each gender

Table 2f. Labour force participation by age groups -- Pessimistic Scenario

Age	Male								Female							
	2007		2030		2050		2070		2007		2030		2050		2070	
	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%	Million	%
15-19	0.88	36.4	0.60	36.0	0.46	36.0	0.36	36.0	0.69	30.1	0.53	33.0	0.40	33.0	0.32	33.0
20-24	1.98	80.8	1.33	76.0	1.04	76.0	0.82	76.0	1.80	75.8	1.31	76.5	1.03	76.5	0.82	76.5
25-29	2.22	88.6	1.67	88.3	1.32	88.3	1.04	88.3	2.04	83.2	1.55	83.3	1.24	83.3	0.98	83.3
30-34	2.31	95.3	2.05	98.0	1.60	98.0	1.24	98.0	1.89	80.8	1.76	86.0	1.39	86.0	1.09	86.0
35-39	3.08	96.7	2.20	99.2	1.72	99.2	1.34	99.2	2.51	82.5	1.86	86.0	1.47	86.0	1.15	86.0
40-44	3.55	96.0	2.47	98.0	1.78	98.0	1.41	98.0	3.00	85.6	2.18	89.0	1.59	89.0	1.26	89.0
45-49	3.21	95.1	2.45	98.0	1.89	98.0	1.50	98.0	2.77	85.1	2.16	88.0	1.64	88.0	1.32	88.0
50-54	2.64	91.5	2.26	94.3	1.96	94.3	1.53	94.3	2.29	80.1	2.18	93.0	1.88	93.0	1.48	93.0
55-59	2.12	82.2	2.26	90.7	1.94	90.7	1.53	90.7	1.73	66.2	1.98	81.0	1.71	81.0	1.35	81.0
60-64	0.83	39.4	1.59	50.0	1.18	50.0	0.85	50.0	0.50	22.7	1.20	38.0	0.90	38.0	0.65	38.0
65-69	0.19	7.3	0.25	8.0	0.18	8.0	0.14	8.0	0.12	4.2	0.14	4.2	0.10	4.2	0.07	4.2
70-74	0.07	3.7	0.09	3.7	0.07	3.7	0.07	3.7	0.03	1.5	0.04	1.5	0.03	1.5	0.03	1.5
75-79	0.02	1.6	0.03	1.6	0.03	1.6	0.03	1.6	0.01	0.5	0.01	0.5	0.01	0.5	0.01	0.5
Total	23.09	57.3	19.26	52.1	15.17	47.9	11.86	47.5	19.38	46.2	16.91	43.7	13.39	40.0	10.55	39.9

Row "Total": Participation rate as percentage of labour force of total male / female population

Columns "%": Participation rate as percentage of labour force in that age category for each gender

Table 2g. Labour market balance - Baseline

Year	Labour Force	Employed					Un-employed
		Self-employed	Employees	Contributors		Others	
			Civil Servants	All	Among which: to health		
	Million persons						
2007	42.5	4.4	2.2	26.6	24.7	6.1	3.2
2008	42.6	4.5	2.1	26.8	24.8	6.1	3.0
2009	42.6	4.5	2.1	27.1	25.1	6.1	2.8
2010	42.6	4.5	2.1	27.7	25.6	5.7	2.6
2011	42.6	4.5	2.1	27.8	25.7	5.7	2.5
2012	42.5	4.5	2.1	27.9	25.8	5.6	2.5
2013	42.5	4.5	2.1	27.9	25.9	5.5	2.4
2014	42.3	4.5	2.1	27.9	25.9	5.4	2.4
2015	42.2	4.5	2.1	27.9	25.7	5.3	2.3
2016	42.0	4.5	2.1	27.9	25.7	5.2	2.3
2017	41.8	4.5	2.1	27.8	25.7	5.1	2.2
2018	41.6	4.5	2.1	27.8	25.6	5.0	2.2
2019	41.3	4.5	2.1	27.7	25.5	4.9	2.1
2020	41.0	4.5	2.1	27.5	25.4	4.8	2.1
2021	40.7	4.5	2.1	27.4	25.3	4.7	2.0
2022	40.4	4.4	2.1	27.2	25.1	4.7	2.0
2023	40.0	4.4	2.1	26.9	24.9	4.6	2.0
2024	39.6	4.4	2.1	26.7	24.6	4.5	2.0
2025	39.2	4.3	2.1	26.5	24.4	4.4	2.0
2026	38.8	4.3	2.0	26.2	24.2	4.4	1.9
2027	38.4	4.2	2.0	25.9	23.9	4.3	1.9
2028	38.0	4.2	2.0	25.7	23.6	4.2	1.9
2029	37.6	4.1	2.0	25.4	23.4	4.1	1.9
2030	37.2	4.1	2.0	25.2	23.3	4.1	1.9
2031	36.7	4.0	1.9	24.9	22.9	4.0	1.8
2032	36.3	4.0	1.9	24.6	22.6	4.0	1.8
2033	35.9	4.0	1.9	24.3	22.3	3.9	1.8
2034	35.6	3.9	1.9	24.1	22.1	3.9	1.8
2035	35.3	3.9	1.9	23.9	21.9	3.9	1.8
2036	35.0	3.8	1.9	23.7	21.7	3.8	1.7
2037	34.7	3.8	1.8	23.5	21.5	3.8	1.7
2038	34.4	3.8	1.8	23.3	21.4	3.8	1.7
2039	34.2	3.8	1.8	23.1	21.2	3.8	1.7
2040	33.9	3.7	1.8	23.0	21.0	3.7	1.7
2041	33.7	3.7	1.8	22.8	20.9	3.7	1.7
2042	33.4	3.7	1.7	22.6	20.7	3.7	1.7
2043	33.2	3.6	1.7	22.5	20.5	3.7	1.7
2044	32.9	3.6	1.7	22.3	20.4	3.6	1.6
2045	32.7	3.6	1.7	22.2	20.2	3.6	1.6
2046	32.4	3.6	1.7	22.0	20.1	3.6	1.6
2047	32.2	3.5	1.6	21.8	19.9	3.6	1.6
2048	32.0	3.5	1.6	21.7	19.7	3.5	1.6
2049	31.7	3.5	1.6	21.5	19.6	3.5	1.6
2050	31.5	3.5	1.6	21.4	19.5	3.5	1.6
2051	31.3	3.4	1.6	21.2	19.3	3.5	1.6
2052	31.1	3.4	1.6	21.1	19.2	3.5	1.6
2053	30.9	3.4	1.6	21.0	19.1	3.4	1.5
2054	30.8	3.4	1.6	20.8	19.0	3.4	1.5
2055	30.6	3.4	1.6	20.7	18.9	3.4	1.5
2056	30.4	3.3	1.6	20.6	18.8	3.4	1.5
2057	30.3	3.3	1.6	20.5	18.7	3.3	1.5
2058	30.1	3.3	1.6	20.4	18.6	3.3	1.5
2059	30.0	3.3	1.6	20.3	18.6	3.3	1.5
2060	29.9	3.3	1.6	20.2	18.5	3.3	1.5
2061	29.8	3.3	1.6	20.2	18.1	3.3	1.5
2062	29.7	3.3	1.6	20.1	18.0	3.2	1.5
2063	29.6	3.3	1.6	20.0	18.0	3.2	1.5
2064	29.5	3.2	1.6	20.0	18.0	3.2	1.5
2065	29.4	3.2	1.6	19.9	17.9	3.2	1.5
2066	29.3	3.2	1.6	19.9	18.0	3.2	1.5
2067	29.3	3.2	1.6	19.8	17.9	3.2	1.5
2068	29.2	3.2	1.6	19.8	17.9	3.2	1.5
2069	29.2	3.2	1.6	19.8	17.8	3.1	1.5
2070	29.1	3.2	1.6	19.7	17.7	3.1	1.5

Table 2h. Labour market balance – Optimistic Scenario

Year	Labour Force	Employed					Un-employed
		Self-employed	Employees				
			Civil Servants	Contributors		Others	
				All	Among which: to health		
	Million persons						
2007	42.6	4.4	2.2	26.7	24.8	6.1	3.2
2008	42.7	4.5	2.1	27.0	24.9	6.2	2.9
2009	42.8	4.6	2.1	27.3	25.2	6.2	2.6
2010	42.8	4.5	2.1	28.1	26.0	5.8	2.4
2011	42.9	4.5	2.1	28.2	26.1	5.8	2.3
2012	43.0	4.6	2.1	28.4	26.3	5.7	2.2
2013	43.0	4.6	2.1	28.5	26.4	5.7	2.1
2014	42.9	4.6	2.1	28.6	26.4	5.6	2.0
2015	42.8	4.6	2.1	28.7	26.5	5.5	1.9
2016	42.8	4.6	2.1	28.7	26.7	5.4	1.8
2017	42.6	4.6	2.1	28.8	26.7	5.3	1.7
2018	42.5	4.6	2.1	28.8	26.6	5.3	1.7
2019	42.3	4.6	2.1	28.8	26.7	5.2	1.6
2020	42.2	4.6	2.1	28.8	26.7	5.1	1.5
2021	41.9	4.6	2.1	28.9	26.6	4.9	1.4
2022	41.7	4.6	2.1	28.9	26.7	4.7	1.4
2023	41.4	4.6	2.1	28.9	26.7	4.5	1.4
2024	41.1	4.5	2.1	28.9	26.7	4.3	1.4
2025	40.8	4.5	2.1	28.9	26.7	4.1	1.3
2026	40.5	4.5	2.0	28.8	26.7	3.9	1.3
2027	40.2	4.4	2.0	28.8	26.7	3.7	1.3
2028	39.9	4.4	2.0	28.8	26.6	3.5	1.2
2029	39.6	4.4	2.0	28.8	26.6	3.3	1.2
2030	39.4	4.3	2.0	28.8	26.7	3.1	1.2
2031	39.2	4.3	1.9	28.6	26.5	3.1	1.2
2032	38.9	4.3	1.9	28.5	26.4	3.1	1.2
2033	38.8	4.3	1.9	28.4	26.2	3.1	1.2
2034	38.7	4.3	1.9	28.3	26.2	3.1	1.2
2035	38.7	4.3	1.9	28.3	26.1	3.1	1.2
2036	38.7	4.3	1.9	28.3	26.1	3.1	1.2
2037	38.7	4.3	1.8	28.3	26.1	3.2	1.2
2038	38.8	4.3	1.8	28.3	26.2	3.2	1.2
2039	38.9	4.3	1.8	28.4	26.3	3.2	1.2
2040	38.9	4.3	1.8	28.5	26.3	3.2	1.2
2041	39.0	4.3	1.8	28.5	26.4	3.3	1.2
2042	39.1	4.3	1.7	28.6	26.4	3.3	1.2
2043	39.1	4.3	1.7	28.6	26.5	3.3	1.2
2044	39.2	4.3	1.7	28.7	26.5	3.4	1.2
2045	39.3	4.3	1.7	28.7	26.5	3.4	1.2
2046	39.3	4.3	1.7	28.7	26.5	3.4	1.2
2047	39.3	4.3	1.6	28.7	26.6	3.4	1.2
2048	39.3	4.3	1.6	28.7	26.6	3.4	1.2
2049	39.3	4.3	1.6	28.8	26.6	3.5	1.2
2050	39.4	4.3	1.6	28.8	25.5	3.5	1.2
2051	39.4	4.3	1.6	28.8	25.5	3.5	1.2
2052	39.5	4.3	1.6	28.9	25.6	3.5	1.2
2053	39.5	4.3	1.6	28.9	25.6	3.5	1.2
2054	39.6	4.4	1.6	29.0	25.7	3.5	1.2
2055	39.7	4.4	1.6	29.0	25.8	3.5	1.2
2056	39.8	4.4	1.6	29.1	25.7	3.6	1.2
2057	40.0	4.4	1.6	29.2	25.7	3.6	1.2
2058	40.2	4.4	1.6	29.4	25.7	3.6	1.2
2059	40.4	4.4	1.6	29.5	25.8	3.6	1.2
2060	40.6	4.5	1.6	29.7	25.9	3.6	1.2
2061	40.8	4.5	1.6	29.8	26.1	3.7	1.2
2062	41.1	4.5	1.6	30.0	26.3	3.7	1.2
2063	41.3	4.5	1.6	30.2	26.6	3.7	1.2
2064	41.6	4.6	1.6	30.4	26.9	3.8	1.2
2065	41.9	4.6	1.6	30.7	27.2	3.8	1.3
2066	42.3	4.6	1.6	30.9	27.7	3.9	1.3
2067	42.6	4.7	1.6	31.1	28.2	3.9	1.3
2068	42.9	4.7	1.6	31.4	28.7	4.0	1.3
2069	43.3	4.8	1.6	31.6	29.4	4.0	1.3
2070	43.6	4.8	1.6	31.9	30.1	4.0	1.3

Table 2i. Labour market balance – Pessimistic Scenario

Year	Labour Force	Employed					Un-employed
			Employees				
				Contributors			
		Self-employed	Civil Servants	All	Among which: to health	Others	
	Million persons						
2007	42.5	4.4	2.2	26.4	24.5	6.1	3.4
2008	42.5	4.5	2.1	26.5	24.5	6.0	3.4
2009	42.5	4.5	2.1	26.5	24.6	5.9	3.4
2010	42.4	4.5	2.1	27.0	24.9	5.5	3.4
2011	42.4	4.5	2.1	26.9	24.9	5.5	3.4
2012	42.3	4.5	2.1	26.9	24.9	5.5	3.4
2013	42.2	4.5	2.1	26.8	24.7	5.5	3.4
2014	42.0	4.5	2.1	26.6	24.6	5.4	3.4
2015	41.8	4.5	2.1	26.5	24.5	5.4	3.3
2016	41.6	4.5	2.1	26.3	24.4	5.3	3.3
2017	41.4	4.5	2.1	26.2	24.2	5.3	3.3
2018	41.1	4.5	2.1	26.0	24.1	5.3	3.3
2019	40.8	4.5	2.1	25.7	23.9	5.2	3.3
2020	40.5	4.5	2.1	25.5	23.5	5.2	3.2
2021	40.1	4.4	2.1	25.2	23.3	5.2	3.2
2022	39.7	4.4	2.1	24.9	23.0	5.2	3.2
2023	39.3	4.3	2.1	24.6	22.8	5.1	3.1
2024	38.9	4.3	2.1	24.3	22.5	5.1	3.1
2025	38.4	4.2	2.1	24.0	22.2	5.1	3.1
2026	38.0	4.2	2.0	23.6	21.8	5.1	3.0
2027	37.5	4.1	2.0	23.3	21.5	5.1	3.0
2028	37.1	4.1	2.0	23.0	21.2	5.1	3.0
2029	36.6	4.0	2.0	22.6	20.9	5.0	2.9
2030	36.2	4.0	2.0	22.3	20.6	5.0	2.9
2031	35.7	3.9	1.9	21.9	20.2	5.0	2.9
2032	35.2	3.9	1.9	21.6	19.9	5.0	2.8
2033	34.7	3.8	1.9	21.3	19.6	4.9	2.8
2034	34.3	3.8	1.9	21.0	19.4	4.9	2.7
2035	34.0	3.7	1.9	20.7	19.0	4.9	2.7
2036	33.6	3.7	1.9	20.4	18.8	4.9	2.7
2037	33.2	3.7	1.8	20.2	18.5	4.9	2.7
2038	32.9	3.6	1.8	20.0	18.3	4.9	2.6
2039	32.6	3.6	1.8	19.7	18.1	4.9	2.6
2040	32.3	3.5	1.8	19.5	17.9	4.9	2.6
2041	31.9	3.5	1.8	19.2	17.7	4.9	2.6
2042	31.6	3.5	1.7	19.0	17.5	4.8	2.5
2043	31.2	3.4	1.7	18.7	17.2	4.8	2.5
2044	30.8	3.4	1.7	18.5	17.0	4.8	2.5
2045	30.5	3.4	1.7	18.2	16.7	4.8	2.4
2046	30.1	3.3	1.7	18.0	16.5	4.8	2.4
2047	29.7	3.3	1.6	17.7	16.2	4.7	2.4
2048	29.3	3.2	1.6	17.4	16.0	4.7	2.3
2049	28.9	3.2	1.6	17.1	15.7	4.7	2.3
2050	28.6	3.1	1.6	16.9	15.4	4.7	2.3
2051	28.2	3.1	1.6	16.6	15.2	4.6	2.3
2052	27.8	3.1	1.6	16.3	15.0	4.6	2.2
2053	27.5	3.0	1.6	16.1	14.8	4.6	2.2
2054	27.1	3.0	1.6	15.8	14.5	4.6	2.2
2055	26.8	2.9	1.6	15.5	14.3	4.6	2.1
2056	26.4	2.9	1.6	15.3	14.1	4.6	2.1
2057	26.1	2.9	1.6	15.0	13.9	4.5	2.1
2058	25.8	2.8	1.6	14.8	13.7	4.5	2.1
2059	25.5	2.8	1.6	14.6	13.5	4.5	2.0
2060	25.2	2.8	1.6	14.3	13.3	4.5	2.0
2061	24.9	2.7	1.6	14.1	13.1	4.5	2.0
2062	24.6	2.7	1.6	13.9	12.9	4.5	2.0
2063	24.3	2.7	1.6	13.7	12.7	4.4	1.9
2064	24.0	2.6	1.6	13.5	12.5	4.4	1.9
2065	23.7	2.6	1.6	13.2	12.2	4.4	1.9
2066	23.5	2.6	1.6	13.0	12.1	4.4	1.9
2067	23.2	2.6	1.6	12.8	11.9	4.4	1.9
2068	22.9	2.5	1.6	12.6	11.8	4.4	1.8
2069	22.7	2.5	1.6	12.4	11.6	4.3	1.8
2070	22.4	2.5	1.6	12.2	11.5	4.3	1.8

Table 2j. Working time

Year	Working time (volume), employed			Working time (per capita), employed		
	Baseline	Optimistic scenario	Pessimistic scenario	Baseline	Optimistic scenario	Pessimistic scenario
	Billion hours per year			Hours per year		
2007	57	57	56	1443	1446	1442
2008	57	58	56	1443	1448	1441
2009	57	58	56	1443	1450	1441
2010	58	59	56	1441	1450	1438
2011	58	59	56	1441	1450	1438
2012	58	59	56	1441	1451	1438
2013	58	59	56	1441	1452	1437
2014	58	59	56	1441	1453	1437
2015	57	59	55	1441	1454	1437
2016	57	60	55	1441	1454	1436
2017	57	60	55	1441	1455	1436
2018	57	59	54	1441	1456	1436
2019	57	59	54	1441	1457	1435
2020	56	59	53	1441	1457	1435
2021	55	59	53	1433	1451	1425
2022	55	58	52	1426	1444	1416
2023	54	58	51	1418	1437	1406
2024	53	57	50	1410	1431	1396
2025	52	56	49	1403	1424	1386
2026	51	56	48	1395	1418	1377
2027	51	55	47	1387	1411	1367
2028	50	54	46	1380	1404	1357
2029	49	54	45	1372	1398	1348
2030	48	53	45	1364	1391	1338
2031	48	53	44	1368	1395	1341
2032	47	53	44	1372	1399	1344
2033	47	53	43	1375	1403	1348
2034	47	53	43	1379	1407	1351
2035	46	53	42	1382	1411	1354
2036	46	53	42	1386	1414	1357
2037	46	53	42	1389	1418	1360
2038	46	53	41	1393	1422	1364
2039	45	54	41	1396	1426	1367
2040	45	54	41	1400	1430	1370
2041	45	54	40	1403	1434	1373
2042	45	55	40	1407	1438	1376
2043	44	55	40	1410	1442	1380
2044	44	55	39	1414	1445	1383
2045	44	55	39	1417	1449	1386
2046	44	55	38	1421	1453	1389
2047	44	56	38	1424	1457	1392
2048	43	56	38	1428	1461	1396
2049	43	56	37	1431	1465	1399
2050	43	56	37	1435	1469	1402
2051	43	56	36	1435	1469	1401
2052	42	56	36	1435	1469	1400
2053	42	56	35	1434	1470	1399
2054	42	56	35	1434	1470	1398
2055	42	57	34	1434	1470	1397
2056	41	57	34	1434	1471	1396
2057	41	57	34	1434	1471	1395
2058	41	57	33	1434	1471	1394
2059	41	58	33	1433	1471	1393
2060	41	58	32	1433	1472	1392
2061	41	58	32	1433	1472	1391
2062	40	59	31	1433	1472	1390
2063	40	59	31	1433	1473	1389
2064	40	59	31	1433	1473	1388
2065	40	60	30	1433	1473	1387
2066	40	60	30	1432	1473	1385
2067	40	61	30	1432	1474	1384
2068	40	61	29	1432	1474	1383
2069	40	62	29	1432	1474	1382
2070	40	62	28	1432	1475	1381

Table 2k. Productivity per hour worked and output per employed

Year	Productivity per hour worked, employed			Output per employed		
	Baseline	Optimistic scenario	Pessimistic scenario	Baseline	Optimistic scenario	Pessimistic scenario
	Growth over previous year in per cent					
2007	1.9	2.0	1.9	1.9	2.0	1.9
2008	1.9	2.2	1.8	1.7	2.4	1.5
2009	1.8	2.3	1.6	1.5	2.5	1.3
2010	1.7	2.5	1.5	1.2	2.1	1.4
2011	1.7	2.5	1.5	1.6	2.5	1.4
2012	1.7	2.5	1.5	1.6	2.5	1.4
2013	1.7	2.5	1.5	1.6	2.4	1.4
2014	1.7	2.5	1.5	1.6	2.5	1.4
2015	1.7	2.5	1.5	1.7	2.5	1.4
2016	1.7	2.5	1.5	1.7	2.5	1.4
2017	1.7	2.5	1.5	1.6	2.5	1.4
2018	1.7	2.5	1.5	1.6	2.5	1.4
2019	1.7	2.5	1.5	1.6	2.5	1.4
2020	1.7	2.5	1.5	1.0	1.8	0.7
2021	1.7	2.5	1.5	1.1	2.0	0.7
2022	1.7	2.5	1.5	1.1	2.0	0.7
2023	1.7	2.5	1.5	1.1	2.0	0.7
2024	1.7	2.5	1.5	1.1	2.0	0.7
2025	1.7	2.5	1.5	1.1	2.0	0.8
2026	1.7	2.5	1.5	1.1	2.1	0.8
2027	1.7	2.5	1.5	1.1	2.1	0.8
2028	1.7	2.5	1.5	1.1	2.1	0.8
2029	1.7	2.5	1.5	1.2	2.1	0.8
2030	1.7	2.5	1.5	1.8	2.6	1.5
2031	1.7	2.5	1.5	2.0	2.9	1.8
2032	1.7	2.5	1.5	2.1	3.0	1.9
2033	1.7	2.5	1.5	2.0	2.9	1.8
2034	1.7	2.5	1.5	2.0	2.9	1.8
2035	1.7	2.5	1.5	2.0	2.9	1.8
2036	1.7	2.5	1.5	2.0	2.9	1.8
2037	1.7	2.5	1.5	2.0	2.9	1.8
2038	1.7	2.5	1.5	2.0	2.8	1.8
2039	1.7	2.5	1.5	1.9	2.8	1.7
2040	1.7	2.5	1.5	1.9	2.7	1.7
2041	1.7	2.5	1.5	2.0	2.7	1.7
2042	1.7	2.5	1.5	2.0	2.8	1.7
2043	1.7	2.5	1.5	2.0	2.8	1.7
2044	1.7	2.5	1.5	1.9	2.7	1.7
2045	1.7	2.5	1.5	1.9	2.7	1.7
2046	1.7	2.5	1.5	1.9	2.8	1.7
2047	1.7	2.5	1.5	2.0	2.8	1.7
2048	1.7	2.5	1.5	2.0	2.8	1.7
2049	1.7	2.5	1.5	2.0	2.8	1.7
2050	1.7	2.5	1.5	1.7	2.5	1.4
2051	1.7	2.5	1.5	1.7	2.6	1.4
2052	1.7	2.5	1.5	1.7	2.5	1.4
2053	1.7	2.5	1.5	1.7	2.6	1.4
2054	1.7	2.5	1.5	1.7	2.6	1.4
2055	1.7	2.5	1.5	1.7	2.6	1.4
2056	1.7	2.5	1.5	1.7	2.6	1.4
2057	1.7	2.5	1.5	1.7	2.6	1.4
2058	1.7	2.5	1.5	1.7	2.6	1.5
2059	1.7	2.5	1.5	1.7	2.6	1.4
2060	1.7	2.5	1.5	1.7	2.6	1.4
2061	1.7	2.5	1.5	1.7	2.6	1.4
2062	1.7	2.5	1.5	1.7	2.6	1.4
2063	1.7	2.5	1.5	1.7	2.6	1.4
2064	1.7	2.5	1.5	1.7	2.6	1.4
2065	1.7	2.5	1.5	1.7	2.5	1.4
2066	1.7	2.5	1.5	1.7	2.5	1.4
2067	1.7	2.5	1.5	1.7	2.5	1.4
2068	1.7	2.5	1.5	1.7	2.5	1.4
2069	1.7	2.5	1.5	1.7	2.5	1.4
2070	1.7	2.5	1.5	1.7	2.5	1.4

Table 3a. Real and nominal GDP - Baseline

Year	**GDP in constant prices** (chain linked)		**Real GDP/ employed**	**GDP deflator**		**GDP** in current prices
	%	2007=100	%			Billion €
2007	2.4	100.0	1.9	0.5	3.0	2371
2008	2.6	102.6	1.9	0.7	3.3	2450
2009	2.4	105.0	1.8	1.0	3.4	2533
2010	2.1	107.3	1.6	1.3	3.4	2620
2011	1.8	109.2	1.7	1.3	3.1	2701
2012	1.7	111.1	1.7	1.3	3.0	2783
2013	1.6	112.9	1.7	1.3	3.0	2866
2014	1.5	114.6	1.7	1.3	2.9	2949
2015	1.4	116.2	1.7	1.4	2.8	3032
2016	1.4	117.8	1.7	1.4	2.8	3117
2017	1.3	119.4	1.7	1.4	2.8	3203
2018	1.3	120.9	1.7	1.5	2.7	3291
2019	1.2	122.3	1.7	1.5	2.7	3379
2020	1.1	123.7	1.7	1.5	2.6	3468
2021	0.4	124.2	1.2	1.5	1.9	3533
2022	0.3	124.5	1.2	1.5	1.8	3597
2023	0.2	124.8	1.2	1.5	1.7	3660
2024	0.2	125.1	1.2	1.5	1.7	3721
2025	0.1	125.2	1.1	1.5	1.6	3781
2026	0.1	125.3	1.1	1.5	1.6	3841
2027	0.1	125.4	1.1	1.5	1.6	3901
2028	0.1	125.5	1.1	1.5	1.6	3962
2029	0.1	125.5	1.1	1.5	1.6	4024
2030	0.1	125.6	1.1	1.5	1.6	4088
2031	0.7	126.5	2.0	1.5	2.2	4179
2032	0.8	127.5	2.0	1.5	2.3	4275
2033	0.9	128.7	2.0	1.5	2.4	4378
2034	1.0	129.9	2.0	1.5	2.5	4486
2035	1.0	131.2	2.0	1.5	2.5	4600
2036	1.1	132.6	2.0	1.5	2.6	4719
2037	1.1	134.1	2.0	1.5	2.6	4843
2038	1.2	135.7	2.0	1.5	2.7	4974
2039	1.2	137.4	2.0	1.5	2.8	5112
2040	1.2	139.1	2.0	1.5	2.7	5251
2041	1.2	140.7	2.0	1.5	2.7	5393
2042	1.2	142.4	2.0	1.5	2.7	5538
2043	1.2	144.1	2.0	1.5	2.7	5689
2044	1.2	145.8	2.0	1.5	2.7	5845
2045	1.2	147.6	2.0	1.5	2.7	6005
2046	1.2	149.4	2.0	1.5	2.7	6169
2047	1.2	151.2	2.0	1.5	2.7	6336
2048	1.2	153.0	2.0	1.5	2.7	6508
2049	1.2	154.9	2.0	1.5	2.8	6687
2050	1.3	156.8	2.0	1.5	2.8	6873
2051	1.0	158.4	1.7	1.5	2.5	7047
2052	1.1	160.1	1.7	1.5	2.6	7229
2053	1.1	161.8	1.7	1.5	2.6	7416
2054	1.1	163.6	1.7	1.5	2.6	7610
2055	1.1	165.5	1.7	1.5	2.6	7811
2056	1.2	167.4	1.7	1.5	2.7	8019
2057	1.2	169.3	1.7	1.5	2.7	8236
2058	1.2	171.4	1.7	1.5	2.7	8461
2059	1.3	173.6	1.7	1.5	2.8	8696
2060	1.3	175.8	1.7	1.5	2.8	8941
2061	1.3	178.1	1.7	1.5	2.8	9194
2062	1.3	180.4	1.7	1.5	2.8	9454
2063	1.3	182.9	1.7	1.5	2.9	9725
2064	1.4	185.4	1.7	1.5	2.9	10006
2065	1.4	188.0	1.7	1.5	2.9	10299
2066	1.4	190.7	1.7	1.5	3.0	10605
2067	1.5	193.5	1.7	1.5	3.0	10923
2068	1.5	196.4	1.7	1.5	3.0	11254
2069	1.5	199.4	1.7	1.5	3.1	11597
2070	1.6	202.5	1.7	1.5	3.1	11954

Table 3b. Real and nominal GDP – Optimistic Scenario

Year	GDP in constant prices (chain linked)		Real GDP/ employed	GDP deflator		GDP in current prices
	%	2007=100		%		Billion €
2007	3.0	100.0	2.0	0.8	3.8	2389
2008	3.3	103.3	2.3	0.8	4.1	2488
2009	3.4	106.8	2.5	1.0	4.4	2597
2010	3.4	110.4	2.5	0.8	4.2	2707
2011	3.0	113.7	2.6	1.1	4.1	2819
2012	2.9	116.9	2.6	1.2	4.1	2934
2013	2.8	120.2	2.6	1.2	4.0	3051
2014	2.7	123.4	2.6	1.2	3.9	3171
2015	2.6	126.6	2.6	1.3	3.9	3296
2016	2.5	129.8	2.6	1.3	3.9	3425
2017	2.5	133.1	2.6	1.3	3.9	3557
2018	2.5	136.3	2.6	1.3	3.8	3693
2019	2.4	139.6	2.6	1.4	3.8	3832
2020	2.3	142.8	2.6	0.7	3.0	3948
2021	1.5	145.0	2.0	1.4	3.0	4066
2022	1.5	147.1	2.0	1.4	2.9	4184
2023	1.4	149.2	2.0	1.4	2.8	4303
2024	1.3	151.2	2.0	1.4	2.8	4424
2025	1.3	153.2	2.0	1.5	2.8	4548
2026	1.3	155.1	2.0	1.5	2.8	4677
2027	1.3	157.2	2.0	1.5	2.9	4811
2028	1.4	159.4	2.0	1.5	2.9	4950
2029	1.4	161.6	2.0	1.6	3.0	5099
2030	1.5	164.0	2.0	2.0	3.6	5281
2031	2.1	167.4	2.8	1.6	3.7	5477
2032	2.2	171.1	2.8	1.7	3.9	5691
2033	2.4	175.2	2.8	1.6	4.1	5922
2034	2.6	179.7	2.8	1.6	4.2	6170
2035	2.7	184.5	2.8	1.6	4.3	6433
2036	2.8	189.7	2.8	1.5	4.4	6713
2037	2.9	195.1	2.8	1.6	4.5	7013
2038	3.0	200.8	2.8	1.5	4.5	7330
2039	3.0	206.9	2.8	1.5	4.5	7661
2040	3.0	213.1	2.8	1.4	4.5	8004
2041	3.0	219.5	2.8	1.4	4.5	8361
2042	3.0	226.0	2.8	1.4	4.4	8732
2043	2.9	232.6	2.8	1.5	4.4	9119
2044	2.9	239.5	2.8	1.4	4.4	9520
2045	2.9	246.4	2.8	1.4	4.4	9935
2046	2.9	253.4	2.8	1.4	4.3	10365
2047	2.8	260.6	2.8	1.4	4.3	10813
2048	2.8	268.0	2.8	1.5	4.3	11281
2049	2.8	275.5	2.8	1.5	4.3	11771
2050	2.8	283.4	2.8	1.2	4.1	12256
2051	2.6	290.8	2.5	1.5	4.2	12767
2052	2.7	298.6	2.5	1.5	4.2	13301
2053	2.7	306.6	2.5	1.5	4.2	13865
2054	2.7	315.0	2.5	1.5	4.3	14460
2055	2.8	323.8	2.5	1.5	4.3	15087
2056	2.8	333.0	2.5	1.5	4.4	15751
2057	2.9	342.6	2.5	1.5	4.5	16453
2058	3.0	352.8	2.5	1.5	4.5	17199
2059	3.0	363.4	2.5	1.5	4.6	17987
2060	3.1	374.6	2.5	1.5	4.6	18818
2061	3.1	386.3	2.5	1.5	4.7	19694
2062	3.2	398.5	2.5	1.5	4.7	20618
2063	3.2	411.2	2.5	1.5	4.7	21594
2064	3.2	424.5	2.5	1.5	4.8	22624
2065	3.3	438.4	2.5	1.5	4.8	23709
2066	3.3	452.9	2.5	1.5	4.8	24851
2067	3.3	467.9	2.5	1.5	4.8	26050
2068	3.3	483.5	2.5	1.5	4.8	27309
2069	3.3	499.6	2.5	1.5	4.8	28630
2070	3.3	516.2	2.5	1.5	4.8	30015

Table 3.c Real and nominal GDP – Pessimistic Scenario

Year	**GDP in constant prices** (chain linked)		**Real GDP/ employed**	**GDP deflator**		**GDP** in current prices
	%	**2007=100**		**%**		**Billion €**
2007	1.8	100.0	1.9	0.5	2.3	2356
2008	1.8	101.8	1.8	0.5	2.3	2411
2009	1.6	103.5	1.6	0.7	2.3	2466
2010	1.3	104.8	1.3	1.3	2.6	2531
2011	1.4	106.2	1.5	1.2	2.6	2596
2012	1.3	107.6	1.5	1.2	2.5	2660
2013	1.2	108.9	1.5	1.2	2.4	2724
2014	1.1	110.1	1.5	1.2	2.3	2788
2015	1.0	111.1	1.5	1.3	2.3	2852
2016	0.9	112.2	1.5	1.3	2.3	2918
2017	0.9	113.2	1.5	1.4	2.3	2984
2018	0.8	114.1	1.5	1.3	2.2	3049
2019	0.7	115.0	1.5	1.4	2.1	3114
2020	0.7	115.7	1.5	0.8	1.4	3158
2021	-0.1	115.6	0.8	1.4	1.3	3200
2022	-0.2	115.4	0.8	1.4	1.3	3241
2023	-0.2	115.2	0.8	1.4	1.2	3279
2024	-0.3	114.8	0.8	1.4	1.1	3316
2025	-0.4	114.4	0.8	1.5	1.1	3352
2026	-0.4	113.9	0.8	1.5	1.1	3388
2027	-0.4	113.4	0.8	1.5	1.0	3423
2028	-0.5	112.9	0.8	1.5	1.0	3458
2029	-0.5	112.4	0.8	1.5	1.1	3495
2030	-0.4	111.9	0.8	2.2	1.8	3558
2031	0.3	112.2	1.7	1.6	1.9	3625
2032	0.4	112.6	1.7	1.6	2.0	3697
2033	0.5	113.2	1.7	1.6	2.1	3773
2034	0.6	113.8	1.7	1.5	2.1	3853
2035	0.6	114.5	1.7	1.5	2.1	3935
2036	0.6	115.2	1.7	1.5	2.2	4020
2037	0.7	116.0	1.7	1.6	2.2	4110
2038	0.7	116.9	1.7	1.5	2.3	4203
2039	0.8	117.7	1.7	1.4	2.2	4296
2040	0.7	118.6	1.7	1.4	2.2	4388
2041	0.7	119.3	1.7	1.4	2.1	4481
2042	0.6	120.1	1.7	1.5	2.1	4574
2043	0.6	120.8	1.7	1.5	2.1	4669
2044	0.6	121.5	1.7	1.4	2.0	4763
2045	0.5	122.1	1.7	1.4	2.0	4857
2046	0.5	122.7	1.7	1.5	1.9	4950
2047	0.4	123.2	1.7	1.5	1.9	5045
2048	0.4	123.7	1.7	1.5	1.9	5141
2049	0.4	124.2	1.7	1.5	1.9	5238
2050	0.4	124.7	1.7	1.2	1.6	5322
2051	0.1	124.8	1.4	1.5	1.6	5408
2052	0.1	125.0	1.4	1.5	1.6	5496
2053	0.1	125.1	1.4	1.5	1.6	5585
2054	0.1	125.3	1.4	1.5	1.6	5677
2055	0.1	125.4	1.4	1.5	1.7	5771
2056	0.2	125.6	1.4	1.5	1.7	5867
2057	0.2	125.9	1.4	1.5	1.7	5966
2058	0.2	126.1	1.4	1.5	1.7	6069
2059	0.2	126.4	1.4	1.5	1.7	6175
2060	0.2	126.7	1.4	1.5	1.7	6282
2061	0.2	127.0	1.4	1.5	1.7	6390
2062	0.2	127.2	1.4	1.5	1.7	6499
2063	0.2	127.5	1.4	1.5	1.7	6612
2064	0.2	127.8	1.4	1.5	1.7	6727
2065	0.2	128.1	1.4	1.5	1.8	6845
2066	0.3	128.4	1.4	1.5	1.8	6966
2067	0.3	128.8	1.4	1.5	1.8	7089
2068	0.3	129.1	1.4	1.5	1.8	7214
2069	0.3	129.5	1.4	1.5	1.8	7341
2070	0.3	129.8	1.4	1.5	1.8	7470

Table 3d. Primary income allocation - Baseline

Year	Nominal GDP	Labor income	Share in GDP	Employer contributions	Wages and salaries	Employee contributions	Employee wage tax	Net wages and salaries
	Billion €		%	Billion€				
2007	2371	1157	48.8	215	942	154	165	622
2008	2450	1193	48.7	223	970	160	170	640
2009	2533	1229	48.5	229	1000	164	176	660
2010	2620	1272	48.6	239	1034	171	181	681
2011	2701	1309	48.5	244	1065	173	187	705
2012	2783	1349	48.5	253	1096	178	192	726
2013	2866	1388	48.4	260	1128	183	198	747
2014	2949	1429	48.5	270	1159	188	204	768
2015	3032	1470	48.5	279	1191	193	209	789
2016	3117	1511	48.5	288	1223	199	215	809
2017	3203	1554	48.5	298	1256	205	220	830
2018	3291	1600	48.6	311	1289	213	226	849
2019	3379	1645	48.7	323	1322	221	232	869
2020	3468	1690	48.7	334	1356	228	238	890
2021	3533	1724	48.8	343	1381	234	242	905
2022	3597	1758	48.9	352	1406	239	247	919
2023	3660	1792	49.0	362	1430	246	251	933
2024	3721	1824	49.0	370	1454	251	255	947
2025	3781	1858	49.1	381	1477	258	259	959
2026	3841	1891	49.2	391	1500	266	263	970
2027	3901	1923	49.3	400	1523	273	267	983
2028	3962	1955	49.3	408	1547	279	272	996
2029	4024	1987	49.4	417	1571	285	276	1009
2030	4088	2025	49.5	430	1595	296	280	1019
2031	4179	2069	49.5	439	1630	303	286	1041
2032	4275	2117	49.5	450	1667	311	293	1063
2033	4378	2167	49.5	460	1707	319	300	1089
2034	4486	2220	49.5	471	1749	327	307	1115
2035	4600	2279	49.5	487	1793	340	315	1138
2036	4719	2338	49.5	499	1838	349	323	1166
2037	4843	2399	49.5	513	1886	359	331	1196
2038	4974	2464	49.5	527	1937	369	340	1227
2039	5112	2531	49.5	541	1990	380	349	1260
2040	5251	2599	49.5	555	2043	391	359	1294
2041	5393	2669	49.5	571	2098	402	368	1328
2042	5538	2741	49.5	587	2154	413	378	1363
2043	5689	2815	49.5	603	2212	424	388	1399
2044	5845	2895	49.5	623	2272	439	399	1435
2045	6005	2976	49.6	642	2334	453	410	1471
2046	6169	3057	49.6	661	2396	466	421	1510
2047	6336	3140	49.6	680	2461	479	432	1550
2048	6508	3225	49.6	698	2527	491	444	1592
2049	6687	3314	49.6	718	2596	505	456	1635
2050	6873	3405	49.5	738	2667	518	468	1681
2051	7047	3491	49.5	756	2734	531	480	1723
2052	7229	3580	49.5	776	2804	544	492	1767
2053	7416	3671	49.5	796	2876	558	505	1813
2054	7610	3766	49.5	816	2950	572	518	1860
2055	7811	3864	49.5	837	3027	586	531	1910
2056	8019	3965	49.4	858	3107	601	546	1961
2057	8236	4071	49.4	880	3191	617	560	2014
2058	8461	4179	49.4	902	3277	632	575	2069
2059	8696	4293	49.4	925	3367	649	591	2128
2060	8941	4409	49.3	948	3461	664	608	2189
2061	9194	4526	49.2	968	3558	677	625	2256
2062	9454	4647	49.2	989	3658	690	642	2326
2063	9725	4777	49.1	1015	3762	709	660	2393
2064	10006	4912	49.1	1042	3870	729	679	2462
2065	10299	5052	49.1	1070	3982	749	699	2534
2066	10605	5197	49.0	1098	4099	769	720	2610
2067	10923	5347	49.0	1126	4221	790	741	2690
2068	11254	5502	48.9	1154	4348	810	763	2775
2069	11597	5663	48.8	1184	4479	831	786	2862
2070	11954	5831	48.8	1215	4616	854	810	2952

Table 3e. Primary income allocation – Optimistic Scenario

Year	Nominal GDP	Labor income	Share in GDP	Employer contributions	Wages and salaries	Employee contributions	Employee wage tax	Net wages and salaries
	Billion €		%	Billion €				
2007	2389	1160	48.5	216	944	155	166	623
2008	2488	1204	48.4	224	979	161	172	646
2009	2597	1252	48.2	233	1019	167	179	673
2010	2707	1308	48.3	241	1067	172	187	707
2011	2819	1362	48.3	250	1112	178	195	738
2012	2934	1418	48.3	261	1157	184	203	770
2013	3051	1476	48.4	271	1204	191	211	802
2014	3171	1535	48.4	283	1252	198	220	834
2015	3296	1597	48.4	296	1301	206	228	867
2016	3425	1660	48.5	309	1352	215	237	900
2017	3557	1725	48.5	321	1404	222	246	935
2018	3693	1793	48.5	335	1458	231	256	971
2019	3832	1867	48.7	354	1513	245	266	1002
2020	3948	1937	49.1	367	1570	253	276	1041
2021	4066	1998	49.1	381	1617	262	284	1071
2022	4184	2061	49.3	396	1665	273	292	1100
2023	4303	2124	49.3	410	1714	283	301	1130
2024	4424	2189	49.5	426	1762	294	309	1159
2025	4548	2253	49.5	442	1812	304	318	1189
2026	4677	2320	49.6	458	1862	317	327	1218
2027	4811	2387	49.6	472	1915	329	336	1250
2028	4950	2458	49.6	488	1970	341	346	1283
2029	5099	2531	49.6	504	2027	354	356	1318
2030	5281	2609	49.4	522	2088	368	366	1353
2031	5477	2704	49.4	543	2162	385	380	1398
2032	5691	2804	49.3	561	2242	399	394	1449
2033	5922	2913	49.2	583	2330	417	409	1504
2034	6170	3030	49.1	605	2424	435	426	1564
2035	6433	3153	49.0	627	2525	452	443	1630
2036	6713	3293	49.0	660	2633	480	462	1691
2037	7013	3434	49.0	686	2748	501	482	1765
2038	7330	3584	48.9	714	2871	523	504	1844
2039	7661	3744	48.9	743	3000	547	527	1926
2040	8004	3910	48.8	774	3136	572	551	2014
2041	8361	4083	48.8	806	3277	597	575	2105
2042	8732	4264	48.8	841	3423	624	601	2198
2043	9119	4452	48.8	877	3575	652	628	2296
2044	9520	4648	48.8	915	3733	681	655	2397
2045	9935	4849	48.8	952	3898	709	684	2505
2046	10365	5056	48.8	989	4067	736	714	2618
2047	10813	5275	48.8	1031	4244	768	745	2731
2048	11281	5502	48.8	1075	4427	801	777	2849
2049	11771	5739	48.8	1120	4619	835	811	2973
2050	12256	5983	48.8	1163	4820	865	846	3109
2051	12767	6225	48.8	1207	5018	896	881	3242
2052	13301	6483	48.7	1256	5227	933	918	3377
2053	13865	6753	48.7	1307	5446	971	956	3519
2054	14460	7039	48.7	1361	5677	1013	997	3668
2055	15087	7337	48.6	1415	5921	1054	1039	3828
2056	15751	7648	48.6	1469	6178	1093	1085	4000
2057	16453	7966	48.4	1516	6451	1125	1132	4193
2058	17199	8312	48.3	1574	6739	1168	1183	4388
2059	17987	8673	48.2	1629	7044	1207	1237	4601
2060	18818	9054	48.1	1686	7368	1248	1293	4827
2061	19694	9462	48.0	1753	7709	1298	1353	5058
2062	20618	9881	47.9	1813	8068	1340	1416	5312
2063	21594	10334	47.9	1886	8448	1395	1483	5569
2064	22624	10805	47.8	1956	8849	1446	1553	5849
2065	23709	11301	47.7	2029	9271	1500	1628	6143
2066	24851	11828	47.6	2110	9717	1562	1706	6449
2067	26050	12382	47.5	2196	10186	1627	1788	6771
2068	27309	12960	47.5	2281	10679	1691	1875	7113
2069	28630	13566	47.4	2369	11196	1758	1966	7472
2070	30015	14206	47.3	2467	11739	1834	2061	7844

Table 3f. Primary income allocation - Pessimistic Scenario

Year	Nominal GDP	Labor income	Share in GDP	Employer contributions	Wages and salaries	Employee contributions	Employee wage tax	Net wages and salaries
	Billion €		%	Billion €				
2007	2356	1150	48.8	215	936	154	164	618
2008	2411	1179	48.9	223	956	160	168	629
2009	2466	1208	49.0	230	977	165	172	641
2010	2531	1240	49.0	239	1001	172	176	654
2011	2596	1274	49.1	247	1027	176	180	670
2012	2660	1308	49.2	255	1053	181	185	687
2013	2724	1339	49.2	261	1078	183	189	705
2014	2788	1373	49.3	270	1103	188	194	721
2015	2852	1407	49.3	278	1128	193	198	737
2016	2918	1440	49.4	287	1154	198	203	753
2017	2984	1475	49.4	295	1179	203	207	770
2018	3049	1509	49.5	304	1205	207	212	786
2019	3114	1545	49.6	314	1231	214	216	801
2020	3158	1582	50.1	326	1256	221	220	814
2021	3200	1606	50.2	333	1274	225	224	825
2022	3241	1631	50.3	340	1290	230	227	834
2023	3279	1656	50.5	349	1307	235	229	842
2024	3316	1679	50.6	357	1322	241	232	849
2025	3352	1700	50.7	364	1337	244	235	858
2026	3388	1719	50.7	368	1351	246	237	868
2027	3423	1741	50.8	376	1365	252	240	873
2028	3458	1759	50.9	380	1379	255	242	882
2029	3495	1777	50.8	384	1393	257	245	891
2030	3558	1800	50.6	393	1407	264	247	897
2031	3625	1832	50.5	399	1433	268	251	913
2032	3697	1866	50.5	407	1459	273	256	929
2033	3773	1903	50.4	415	1488	279	261	948
2034	3853	1945	50.5	427	1518	289	267	963
2035	3935	1985	50.5	435	1550	294	272	983
2036	4020	2028	50.4	445	1583	301	278	1004
2037	4110	2071	50.4	455	1617	307	284	1025
2038	4203	2118	50.4	465	1653	315	290	1048
2039	4296	2168	50.5	479	1690	326	297	1067
2040	4388	2216	50.5	489	1727	333	303	1090
2041	4481	2265	50.5	501	1764	341	310	1113
2042	4574	2313	50.6	512	1801	348	316	1136
2043	4669	2362	50.6	524	1838	356	323	1160
2044	4763	2412	50.6	536	1876	363	329	1183
2045	4857	2461	50.7	548	1913	370	336	1207
2046	4950	2510	50.7	560	1950	378	342	1230
2047	5045	2563	50.8	575	1988	388	349	1250
2048	5141	2613	50.8	588	2025	396	356	1274
2049	5238	2663	50.8	600	2063	403	362	1298
2050	5322	2714	51.0	612	2102	409	369	1324
2051	5408	2758	51.0	623	2135	416	375	1345
2052	5496	2802	51.0	633	2169	421	381	1367
2053	5585	2848	51.0	644	2204	427	387	1390
2054	5677	2894	51.0	654	2240	433	393	1413
2055	5771	2941	51.0	666	2276	439	400	1437
2056	5867	2989	50.9	676	2313	445	406	1462
2057	5966	3038	50.9	686	2351	451	413	1488
2058	6069	3088	50.9	697	2391	457	420	1514
2059	6175	3139	50.8	708	2431	463	427	1542
2060	6282	3192	50.8	719	2473	469	434	1570
2061	6390	3245	50.8	730	2516	475	442	1599
2062	6499	3299	50.8	741	2558	481	449	1629
2063	6612	3354	50.7	752	2602	487	457	1658
2064	6727	3409	50.7	763	2646	493	465	1689
2065	6845	3464	50.6	772	2692	496	473	1723
2066	6966	3522	50.6	784	2739	503	481	1755
2067	7089	3582	50.5	796	2787	511	489	1787
2068	7214	3643	50.5	808	2835	517	498	1820
2069	7341	3705	50.5	820	2885	525	506	1854
2070	7470	3767	50.4	832	2935	532	515	1888

Table 4a. Social budget expenditure and financial balance – Baseline

Year	Expenditure								Total Revenue and Expenditure		
	Family	Health	Employ-ment	Old Age Survivors	Political events	Housing	Prom. of savings	General soc. aid	Total Revenue	Balance	Total Expenditure
	Billion €										
2007	101.3	250.9	46.9	276.0	2.0	16.3	7.8	3.2	729.7	25.4	704.3
2008	101.8	258.2	43.4	280.6	1.9	16.8	7.0	3.3	746.3	33.4	712.9
2009	102.5	267.0	39.6	287.9	1.8	17.3	6.1	3.4	763.4	37.8	725.5
2010	103.2	274.8	37.7	295.0	1.7	17.8	5.2	3.5	786.4	47.4	739.0
2011	104.6	283.1	37.2	305.2	1.6	18.3	4.3	3.6	801.8	43.8	757.9
2012	106.3	291.4	36.8	317.4	1.5	18.9	3.5	3.7	824.1	44.5	779.6
2013	108.3	299.9	36.6	326.8	1.4	19.4	2.6	3.8	845.0	46.1	798.8
2014	110.4	308.6	36.4	339.9	1.3	20.0	1.7	3.9	870.0	47.6	822.4
2015	112.8	317.6	36.5	352.7	1.2	20.5	1.0	4.0	894.4	48.1	846.3
2016	115.0	326.6	36.6	365.7	1.1	21.1	1.0	4.1	921.6	50.3	871.3
2017	117.2	335.8	36.6	379.1	1.0	21.6	1.0	4.3	947.2	50.6	896.7
2018	119.3	345.1	36.7	392.7	0.9	22.2	1.0	4.4	978.8	56.5	922.3
2019	121.7	354.6	36.7	405.1	0.8	22.8	1.0	4.5	1,008.5	61.4	947.1
2020	124.1	363.2	36.7	418.3	0.7	23.2	1.0	4.6	1,036.9	65.2	971.8
2021	126.1	371.2	37.1	429.2	0.6	23.6	1.0	4.7	1,059.4	66.0	993.4
2022	128.4	378.7	37.5	441.7	0.5	24.0	1.0	4.7	1,083.9	67.4	1,016.5
2023	131.0	386.2	37.9	454.1	0.4	24.4	1.0	4.8	1,110.0	70.2	1,039.8
2024	133.8	393.9	38.3	466.4	0.3	24.8	1.0	4.9	1,133.7	70.3	1,063.4
2025	136.9	401.7	38.8	480.2	0.2	25.2	1.0	5.0	1,162.6	73.6	1,089.0
2026	140.3	409.5	39.2	492.3	0.1	25.6	1.0	5.0	1,193.0	79.9	1,113.1
2027	143.9	417.5	39.6	505.4	-	26.0	1.0	5.1	1,220.2	81.7	1,138.5
2028	147.6	425.7	40.0	518.1	-	26.4	1.0	5.2	1,246.1	82.0	1,164.2
2029	151.6	434.3	40.5	531.7	-	26.8	1.0	5.3	1,273.3	82.0	1,191.3
2030	155.9	444.1	40.9	546.2	-	27.4	1.0	5.4	1,312.5	91.5	1,221.0
2031	161.6	454.7	41.4	565.9	-	28.1	1.0	5.5	1,345.8	87.5	1,258.3
2032	167.6	466.6	41.9	586.0	-	28.7	1.0	5.7	1,383.5	86.1	1,297.4
2033	173.7	478.9	42.5	606.3	-	29.5	1.0	5.8	1,419.5	81.9	1,337.7
2034	180.0	491.9	43.0	626.8	-	30.2	1.0	5.9	1,458.7	79.9	1,378.8
2035	186.6	505.2	43.6	647.0	-	31.0	1.0	6.1	1,509.4	88.9	1,420.5
2036	193.4	519.0	44.2	667.7	-	31.8	1.0	6.3	1,552.0	88.7	1,463.3
2037	200.4	533.4	44.9	688.2	-	32.6	1.0	6.4	1,596.3	89.3	1,507.0
2038	207.8	548.4	45.5	708.8	-	33.5	1.0	6.6	1,642.2	90.6	1,551.6
2039	215.4	563.8	46.2	729.7	-	34.4	1.0	6.8	1,689.4	92.1	1,597.3
2040	223.4	579.6	46.9	751.0	-	35.4	1.0	7.0	1,737.7	93.6	1,644.1
2041	231.5	595.8	47.6	773.1	-	36.3	1.0	7.2	1,787.8	95.3	1,692.5
2042	239.7	612.5	48.3	795.6	-	37.3	1.0	7.3	1,838.9	97.2	1,741.7
2043	248.0	629.6	49.1	819.1	-	38.3	1.0	7.5	1,891.4	98.8	1,792.6
2044	256.3	647.0	49.8	843.3	-	39.3	1.0	7.8	1,953.3	108.8	1,844.5
2045	264.7	664.9	50.6	868.3	-	40.4	1.0	8.0	2,013.4	115.5	1,897.9
2046	273.2	683.3	51.3	893.8	-	41.5	1.0	8.2	2,070.7	118.3	1,952.3
2047	281.8	701.6	52.1	919.9	-	42.6	1.0	8.4	2,129.0	121.5	2,007.4
2048	290.6	719.7	52.9	945.6	-	43.8	1.0	8.6	2,187.1	124.8	2,062.3
2049	299.5	737.8	53.7	972.1	-	45.0	1.0	8.9	2,248.0	130.1	2,117.9
2050	308.5	754.9	54.6	998.9	-	46.1	1.0	9.1	2,308.4	135.4	2,173.1
2051	317.0	772.4	55.4	1,024.1	-	47.3	1.0	9.3	2,367.0	140.6	2,226.4
2052	326.0	789.5	56.2	1,049.6	-	48.5	1.0	9.6	2,427.3	146.9	2,280.4
2053	335.5	806.5	57.1	1,075.8	-	49.8	1.0	9.8	2,489.5	154.0	2,335.5
2054	345.5	823.5	57.9	1,102.3	-	51.1	1.0	10.1	2,553.7	162.3	2,391.4
2055	356.0	840.6	58.8	1,129.3	-	52.4	1.0	10.3	2,619.8	171.3	2,448.5
2056	367.0	857.7	59.8	1,156.0	-	53.9	1.0	10.6	2,687.3	181.5	2,505.8
2057	378.5	874.8	60.7	1,182.8	-	55.3	1.0	10.9	2,758.0	194.0	2,564.0
2058	390.6	892.0	61.7	1,210.0	-	56.8	1.0	11.2	2,829.8	206.6	2,623.3
2059	403.1	909.3	62.7	1,238.0	-	58.4	1.0	11.5	2,903.7	219.6	2,684.2
2060	416.2	927.0	63.7	1,266.7	-	60.1	1.0	11.8	2,977.8	231.3	2,746.6
2061	429.8	945.0	65.0	1,296.5	-	61.8	1.0	12.2	3,047.4	236.2	2,811.2
2062	443.8	963.7	66.1	1,327.3	-	63.5	1.0	12.5	3,119.9	242.0	2,877.9
2063	458.3	983.0	67.2	1,359.1	-	65.3	1.0	12.9	3,204.7	258.0	2,946.8
2064	473.3	1,002.9	68.4	1,391.5	-	67.2	1.0	13.2	3,293.8	276.3	3,017.5
2065	488.7	1,023.9	69.6	1,424.9	-	69.2	1.0	13.6	3,383.8	293.0	3,090.9
2066	504.4	1,046.1	70.8	1,458.8	-	71.3	1.0	14.0	3,475.9	309.5	3,166.5
2067	520.6	1,069.4	72.1	1,493.6	-	73.4	1.0	14.5	3,567.9	323.3	3,244.6
2068	537.1	1,093.8	73.5	1,529.3	-	75.7	1.0	14.9	3,661.5	336.3	3,325.2
2069	554.0	1,119.2	74.9	1,566.1	-	78.0	1.0	15.4	3,758.4	349.9	3,408.5
2070	571.3	1,145.7	76.3	1,603.8	-	80.3	1.0	15.8	3,861.2	366.9	3,494.3

Table 4b. Social budget expenditure and financial balance - Optimistic Scenario

Year	Expenditure								Total Revenue and Expenditure		
	Family	Health	Employ-ment	Old Age Survivors	Political events	Housing	Prom. of savings	General soc. aid	Total Revenue	Balance	Total Expenditure
	Billion €										
2007	101.3	251.6	46.9	276.0	2.0	16.4	7.8	3.2	731.2	26.0	705.2
2008	102.4	260.1	42.5	280.7	1.9	17.0	7.0	3.4	751.1	36.1	715.0
2009	103.9	271.1	37.8	290.0	1.8	17.8	6.1	3.5	774.2	42.1	732.0
2010	105.8	281.0	36.2	299.9	1.7	18.5	5.2	3.7	797.0	45.0	752.0
2011	108.4	291.5	35.4	316.5	1.6	19.3	4.3	3.8	824.5	43.6	780.8
2012	111.8	302.1	34.6	329.5	1.5	20.1	3.5	4.0	853.8	46.8	807.0
2013	115.7	313.0	34.1	342.0	1.4	20.9	2.6	4.1	884.5	50.6	833.8
2014	120.3	324.3	33.6	358.1	1.3	21.7	1.7	4.3	919.4	54.2	865.3
2015	125.6	336.0	33.3	374.6	1.2	22.6	1.0	4.4	956.3	57.7	898.7
2016	131.3	348.0	32.9	391.5	1.1	23.5	1.0	4.6	997.0	63.1	933.8
2017	137.4	360.2	32.5	409.3	1.0	24.4	1.0	4.8	1,034.5	63.9	970.6
2018	144.1	372.8	32.1	427.3	0.9	25.3	1.0	5.0	1,077.3	68.8	1,008.5
2019	151.6	385.8	31.7	446.1	0.8	26.3	1.0	5.2	1,131.0	82.6	1,048.4
2020	159.9	397.9	31.2	462.4	0.7	27.0	1.0	5.3	1,172.5	87.2	1,085.4
2021	168.0	409.5	31.3	480.4	0.6	27.8	1.0	5.5	1,216.4	92.3	1,124.1
2022	176.7	421.1	31.5	499.1	0.5	28.7	1.0	5.6	1,263.1	99.0	1,164.1
2023	185.8	432.9	31.6	519.1	0.4	29.5	1.0	5.8	1,309.8	103.7	1,206.1
2024	195.3	445.2	31.7	539.7	0.3	30.3	1.0	6.0	1,361.0	111.7	1,249.4
2025	205.2	457.7	31.8	561.0	0.2	31.2	1.0	6.1	1,410.7	116.5	1,294.3
2026	215.5	470.6	32.0	582.9	0.1	32.0	1.0	6.3	1,465.4	125.0	1,340.4
2027	226.2	484.0	32.1	604.1	-	33.0	1.0	6.5	1,516.6	129.8	1,386.8
2028	237.2	497.8	32.2	627.7	-	33.9	1.0	6.7	1,571.9	135.3	1,436.5
2029	248.6	512.4	32.3	651.0	-	34.9	1.0	6.9	1,628.8	141.6	1,487.1
2030	260.5	528.8	32.4	676.1	-	36.2	1.0	7.1	1,690.5	148.4	1,542.1
2031	274.6	546.5	32.9	708.1	-	37.5	1.0	7.4	1,764.4	156.5	1,607.9
2032	288.9	566.0	33.3	735.6	-	39.0	1.0	7.7	1,833.5	161.9	1,671.5
2033	303.4	586.7	33.9	767.5	-	40.6	1.0	8.0	1,909.4	168.4	1,741.0
2034	318.1	608.7	34.4	797.6	-	42.3	1.0	8.3	1,988.0	177.5	1,810.4
2035	333.2	631.8	35.0	829.1	-	44.1	1.0	8.7	2,066.2	183.4	1,882.8
2036	348.6	655.9	35.6	862.1	-	46.0	1.0	9.1	2,171.1	212.8	1,958.3
2037	364.3	681.5	36.3	895.1	-	48.0	1.0	9.5	2,260.2	224.5	2,035.7
2038	380.6	708.4	37.0	929.6	-	50.2	1.0	9.9	2,353.9	237.3	2,116.6
2039	397.3	736.4	37.7	965.8	-	52.5	1.0	10.3	2,453.1	252.0	2,201.0
2040	414.5	765.7	38.5	1,003.2	-	54.8	1.0	10.8	2,554.5	266.0	2,288.5
2041	432.7	796.1	39.3	1,043.6	-	57.3	1.0	11.3	2,661.8	280.6	2,381.2
2042	452.3	827.7	40.1	1,085.3	-	59.8	1.0	11.8	2,775.8	297.7	2,478.1
2043	473.4	860.6	41.0	1,130.4	-	62.5	1.0	12.3	2,895.7	314.5	2,581.1
2044	496.1	894.4	41.8	1,177.6	-	65.2	1.0	12.8	3,021.2	332.2	2,689.0
2045	520.5	929.7	42.7	1,227.8	-	68.0	1.0	13.4	3,148.8	345.6	2,803.2
2046	546.5	966.5	43.6	1,281.7	-	71.0	1.0	14.0	3,279.2	354.8	2,924.3
2047	574.4	1,003.8	44.5	1,340.1	-	74.1	1.0	14.6	3,424.8	372.3	3,052.5
2048	604.0	1,041.6	45.5	1,396.4	-	77.3	1.0	15.2	3,575.7	394.7	3,181.0
2049	635.5	1,080.2	46.5	1,455.5	-	80.6	1.0	15.9	3,731.9	416.7	3,315.2
2050	668.9	1,118.2	47.7	1,516.4	-	84.0	1.0	16.5	3,885.2	432.5	3,452.7
2051	702.4	1,157.7	48.7	1,576.9	-	87.4	1.0	17.2	4,047.4	456.1	3,591.3
2052	737.6	1,197.5	49.8	1,639.0	-	91.1	1.0	17.9	4,218.1	484.1	3,734.0
2053	774.4	1,238.3	50.9	1,703.8	-	95.0	1.0	18.7	4,396.8	514.7	3,882.2
2054	812.9	1,280.1	52.1	1,769.9	-	99.0	1.0	19.5	4,585.7	551.2	4,034.6
2055	852.9	1,323.0	53.4	1,838.5	-	103.3	1.0	20.4	4,776.5	584.1	4,192.5
2056	894.4	1,367.2	54.8	1,907.3	-	107.9	1.0	21.3	4,968.7	614.9	4,353.8
2057	937.4	1,412.7	56.2	1,978.2	-	112.7	1.0	22.2	5,149.6	629.2	4,520.4
2058	981.8	1,459.7	57.8	2,060.1	-	117.8	1.0	23.2	5,359.8	658.4	4,701.4
2059	1,027.8	1,508.4	59.4	2,136.0	-	123.2	1.0	24.3	5,564.9	684.8	4,880.2
2060	1,075.3	1,559.0	61.2	2,219.4	-	128.9	1.0	25.4	5,780.4	710.2	5,070.2
2061	1,124.5	1,611.8	63.1	2,307.0	-	134.9	1.0	26.6	6,019.4	750.5	5,268.9
2062	1,175.4	1,667.2	65.0	2,392.8	-	141.2	1.0	27.8	6,246.0	775.5	5,470.6
2063	1,228.3	1,725.3	67.1	2,491.3	-	147.9	1.0	29.1	6,508.7	818.6	5,690.1
2064	1,283.3	1,786.2	69.3	2,584.6	-	155.0	1.0	30.5	6,765.7	855.8	5,909.9
2065	1,340.6	1,850.7	71.6	2,688.6	-	162.4	1.0	32.0	7,037.4	890.5	6,146.8
2066	1,400.4	1,919.0	74.0	2,796.2	-	170.2	1.0	33.5	7,331.2	936.8	6,394.4
2067	1,463.1	1,991.1	76.6	2,905.7	-	178.4	1.0	35.1	7,638.8	987.7	6,651.1
2068	1,528.8	2,067.1	79.3	3,019.5	-	187.1	1.0	36.8	7,951.9	1,032.3	6,919.7
2069	1,597.9	2,147.0	82.1	3,142.7	-	196.1	1.0	38.6	8,281.1	1,075.7	7,205.4
2070	1,670.5	2,231.3	85.1	3,270.9	-	205.6	1.0	40.5	8,636.7	1,131.8	7,504.8

Table 4c. Social budget expenditure and financial balance - Pessimistic Scenario

Year	Expenditure								Total Revenue and Expenditure		
	Family	Health	Employ-ment	Old Age Survivors	Political events	Housing	Prom. of savings	General soc. aid	Total Revenue	Balance	Total Expenditure
	Billion €										
2007	101.2	250.2	47.0	276.0	2.0	16.1	7.8	3.2	728.1	24.6	703.5
2008	101.6	256.6	47.2	280.6	1.9	16.5	7.0	3.3	745.2	30.6	714.6
2009	102.1	264.1	47.3	287.0	1.8	16.9	6.1	3.3	763.4	34.7	728.7
2010	102.5	271.1	47.5	292.8	1.7	17.3	5.2	3.4	784.1	42.6	741.5
2011	103.5	278.5	47.6	301.8	1.6	17.8	4.3	3.5	803.5	44.8	758.7
2012	104.9	286.1	47.8	310.6	1.5	18.2	3.5	3.6	823.4	47.2	776.2
2013	106.5	293.7	48.2	318.6	1.4	18.7	2.6	3.7	839.5	46.2	793.2
2014	108.2	301.5	48.6	330.7	1.3	19.1	1.7	3.8	861.6	46.7	814.9
2015	110.1	309.4	49.3	342.1	1.2	19.5	1.0	3.8	884.2	47.7	836.4
2016	111.9	317.4	49.9	353.5	1.1	20.0	1.0	3.9	907.5	48.6	858.9
2017	113.6	325.5	50.5	365.4	1.0	20.4	1.0	4.0	928.9	47.5	881.5
2018	115.2	333.7	51.1	377.2	0.9	20.9	1.0	4.1	951.2	47.2	904.1
2019	117.0	342.0	51.6	389.6	0.8	21.3	1.0	4.2	976.5	49.0	927.5
2020	118.8	349.4	52.1	400.9	0.7	21.6	1.0	4.3	1,003.9	55.1	948.8
2021	120.0	356.0	52.6	407.3	0.6	21.9	1.0	4.3	1,019.7	55.9	963.7
2022	121.3	362.3	53.0	417.3	0.5	22.2	1.0	4.4	1,038.7	56.8	981.9
2023	122.6	368.5	53.4	426.6	0.4	22.5	1.0	4.4	1,060.8	61.4	999.4
2024	124.0	374.8	53.8	436.6	0.3	22.7	1.0	4.5	1,080.7	63.0	1,017.7
2025	125.4	381.2	54.1	446.0	0.2	23.0	1.0	4.5	1,096.8	61.4	1,035.4
2026	126.8	387.6	54.5	456.6	0.1	23.2	1.0	4.6	1,110.5	56.2	1,054.3
2027	128.1	394.1	54.8	467.0	-	23.4	1.0	4.6	1,133.0	60.0	1,073.0
2028	129.4	400.6	55.0	478.1	-	23.7	1.0	4.7	1,146.9	54.3	1,092.6
2029	130.7	407.5	55.3	489.4	-	23.9	1.0	4.7	1,161.0	48.6	1,112.5
2030	131.9	415.7	55.6	501.4	-	24.4	1.0	4.8	1,185.3	50.5	1,134.7
2031	134.4	424.6	56.1	518.2	-	24.8	1.0	4.9	1,208.2	44.2	1,164.0
2032	136.9	434.6	56.8	534.7	-	25.3	1.0	5.0	1,233.4	39.1	1,194.3
2033	139.4	445.0	57.6	551.2	-	25.8	1.0	5.1	1,258.0	32.8	1,225.2
2034	142.0	455.9	58.4	567.8	-	26.4	1.0	5.2	1,294.9	38.2	1,256.7
2035	144.6	467.1	59.2	584.0	-	27.0	1.0	5.3	1,321.6	33.3	1,288.2
2036	147.3	478.5	60.1	600.5	-	27.5	1.0	5.4	1,350.6	30.2	1,320.4
2037	150.1	490.5	61.0	616.7	-	28.2	1.0	5.5	1,379.5	26.6	1,352.9
2038	152.9	502.9	61.9	632.9	-	28.8	1.0	5.7	1,410.5	24.5	1,386.0
2039	155.7	515.5	62.8	649.2	-	29.4	1.0	5.8	1,450.8	31.4	1,419.4
2040	158.7	528.4	63.7	665.9	-	30.1	1.0	5.9	1,482.7	29.2	1,453.5
2041	161.7	541.4	64.6	683.1	-	30.7	1.0	6.0	1,515.7	27.2	1,488.5
2042	164.8	554.7	65.5	700.5	-	31.3	1.0	6.2	1,548.9	25.0	1,523.9
2043	167.9	568.2	66.4	718.6	-	32.0	1.0	6.3	1,582.8	22.3	1,560.5
2044	171.2	581.7	67.4	737.3	-	32.6	1.0	6.4	1,617.1	19.4	1,597.6
2045	174.6	595.5	68.3	756.4	-	33.3	1.0	6.6	1,651.5	16.0	1,635.5
2046	178.0	609.5	69.2	775.7	-	33.9	1.0	6.7	1,686.1	12.1	1,674.0
2047	181.5	623.1	70.1	795.3	-	34.6	1.0	6.8	1,730.9	18.5	1,712.4
2048	185.1	636.4	71.0	814.2	-	35.2	1.0	6.9	1,767.0	17.0	1,749.9
2049	188.8	649.4	71.9	833.4	-	35.9	1.0	7.1	1,802.4	14.9	1,787.5
2050	192.6	661.2	72.8	852.6	-	36.5	1.0	7.2	1,836.4	12.5	1,823.9
2051	195.9	673.1	73.7	869.4	-	37.0	1.0	7.3	1,868.0	10.6	1,857.4
2052	199.2	684.4	74.6	886.0	-	37.6	1.0	7.4	1,898.7	8.4	1,890.3
2053	202.6	695.4	75.4	902.7	-	38.3	1.0	7.5	1,930.5	7.6	1,922.9
2054	206.1	706.1	76.3	919.2	-	38.9	1.0	7.7	1,961.6	6.4	1,955.2
2055	209.6	716.5	77.2	935.6	-	39.5	1.0	7.8	1,993.8	6.6	1,987.3
2056	213.1	726.8	78.1	951.3	-	40.2	1.0	7.9	2,024.6	6.2	2,018.4
2057	216.7	736.8	79.1	966.6	-	40.9	1.0	8.0	2,056.5	7.4	2,049.1
2058	220.4	746.7	80.0	981.8	-	41.6	1.0	8.2	2,088.7	9.1	2,079.6
2059	224.1	756.5	81.0	997.2	-	42.3	1.0	8.3	2,121.4	11.1	2,110.3
2060	227.8	766.2	81.9	1,012.8	-	43.0	1.0	8.5	2,154.3	13.0	2,141.3
2061	231.7	775.9	82.9	1,028.8	-	43.8	1.0	8.6	2,187.3	14.6	2,172.7
2062	235.6	785.9	83.9	1,045.2	-	44.5	1.0	8.8	2,220.7	15.7	2,204.9
2063	239.5	796.1	84.9	1,062.0	-	45.3	1.0	8.9	2,255.3	17.5	2,237.8
2064	243.6	806.5	86.0	1,079.0	-	46.1	1.0	9.1	2,289.6	18.4	2,271.2
2065	247.7	817.5	87.1	1,096.3	-	46.9	1.0	9.2	2,318.9	13.2	2,305.8
2066	251.9	829.1	88.2	1,113.7	-	47.7	1.0	9.4	2,356.2	15.2	2,341.0
2067	256.2	841.2	89.2	1,131.4	-	48.6	1.0	9.6	2,394.4	17.3	2,377.1
2068	260.6	853.8	90.3	1,149.3	-	49.4	1.0	9.7	2,431.3	17.0	2,414.2
2069	265.0	866.8	91.4	1,167.7	-	50.3	1.0	9.9	2,469.3	17.1	2,452.2
2070	269.6	880.4	92.5	1,186.4	-	51.2	1.0	10.1	2,507.8	16.6	2,491.2

Table 4d. Social budget revenue, per cent of GDP – Baseline

Year	Social security contributions						State subsidies	Other revenue	Total revenue
	Paid by employers		Paid by insured						
	Actual	Imputed	Employees	Self-employed	Beneficiaries	Others			
	%								
2007	7.0	2.9	6.3	0.4	0.9	0.5	12.1	0.5	30.7
2008	7.0	2.9	6.4	0.4	0.9	0.5	11.8	0.5	30.4
2009	6.9	2.9	6.3	0.4	0.8	0.5	11.6	0.5	30.1
2010	7.0	3.0	6.4	0.4	0.8	0.5	11.3	0.5	29.9
2011	6.8	3.0	6.3	0.4	0.8	0.5	11.2	0.5	29.6
2012	6.8	3.1	6.2	0.4	0.8	0.5	11.1	0.5	29.5
2013	6.8	3.2	6.2	0.4	0.8	0.5	11.0	0.5	29.4
2014	6.7	3.2	6.2	0.4	0.8	0.5	11.0	0.5	29.4
2015	6.7	3.3	6.2	0.4	0.8	0.5	10.9	0.5	29.4
2016	6.7	3.4	6.2	0.4	0.8	0.5	10.9	0.5	29.5
2017	6.7	3.4	6.2	0.4	0.8	0.5	10.9	0.5	29.5
2018	6.8	3.5	6.3	0.4	0.8	0.5	10.8	0.6	29.7
2019	6.8	3.6	6.4	0.4	0.8	0.5	10.7	0.6	29.8
2020	6.9	3.6	6.4	0.4	0.8	0.5	10.7	0.5	29.8
2021	6.9	3.7	6.4	0.4	0.8	0.5	10.6	0.5	29.9
2022	6.9	3.7	6.5	0.4	0.8	0.5	10.6	0.5	30.1
2023	7.0	3.8	6.5	0.4	0.8	0.5	10.7	0.5	30.2
2024	7.0	3.8	6.6	0.4	0.8	0.5	10.7	0.5	30.4
2025	7.1	3.9	6.6	0.4	0.9	0.5	10.8	0.5	30.7
2026	7.1	3.9	6.7	0.4	0.9	0.5	10.8	0.5	30.8
2027	7.3	3.9	6.8	0.4	0.9	0.5	10.9	0.5	31.2
2028	7.3	3.9	6.9	0.4	0.9	0.5	11.0	0.5	31.4
2029	7.3	4.0	6.9	0.4	0.9	0.5	11.0	0.5	31.6
2030	7.4	4.0	7.0	0.4	0.9	0.5	11.1	0.5	31.9
2031	7.5	4.0	7.0	0.4	1.0	0.5	11.2	0.5	32.1
2032	7.5	4.0	7.1	0.4	1.0	0.5	11.3	0.5	32.3
2033	7.5	4.0	7.1	0.4	1.0	0.5	11.4	0.5	32.4
2034	7.5	4.0	7.1	0.4	1.0	0.5	11.5	0.5	32.5
2035	7.5	3.9	7.1	0.4	1.0	0.5	11.5	0.5	32.5
2036	7.6	3.9	7.2	0.4	1.0	0.5	11.6	0.5	32.8
2037	7.6	3.9	7.2	0.4	1.0	0.5	11.7	0.5	32.9
2038	7.6	3.9	7.2	0.4	1.0	0.5	11.7	0.5	32.9
2039	7.6	3.9	7.2	0.4	1.1	0.5	11.7	0.5	33.0
2040	7.6	3.9	7.2	0.4	1.1	0.5	11.8	0.5	33.0
2041	7.6	3.9	7.2	0.4	1.1	0.5	11.8	0.5	33.1
2042	7.6	4.0	7.2	0.4	1.1	0.5	11.8	0.5	33.1
2043	7.6	4.0	7.2	0.4	1.1	0.5	11.8	0.5	33.2
2044	7.6	4.0	7.2	0.4	1.1	0.5	11.9	0.5	33.2
2045	7.6	4.0	7.2	0.4	1.1	0.5	11.9	0.5	33.2
2046	7.6	4.0	7.3	0.4	1.1	0.5	11.9	0.5	33.5
2047	7.6	4.0	7.3	0.4	1.1	0.5	11.9	0.5	33.5
2048	7.6	4.0	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2049	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2050	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2051	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2052	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2053	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2054	7.6	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2055	7.5	4.1	7.3	0.4	1.2	0.5	11.9	0.5	33.5
2056	7.5	4.1	7.2	0.4	1.2	0.5	11.9	0.5	33.4
2057	7.5	4.1	7.2	0.4	1.2	0.5	11.9	0.5	33.4
2058	7.5	4.1	7.2	0.4	1.2	0.5	11.8	0.5	33.3
2059	7.5	4.1	7.2	0.4	1.2	0.5	11.8	0.5	33.3
2060	7.4	4.1	7.2	0.4	1.2	0.5	11.8	0.5	33.2
2061	7.4	4.1	7.1	0.4	1.2	0.5	11.8	0.5	33.0
2062	7.3	4.1	7.0	0.4	1.2	0.5	11.8	0.5	32.9
2063	7.3	4.1	7.0	0.4	1.2	0.5	11.8	0.5	32.8
2064	7.3	4.0	7.0	0.4	1.2	0.5	11.8	0.5	32.8
2065	7.2	4.0	7.0	0.4	1.2	0.5	11.8	0.5	32.7
2066	7.2	4.0	7.0	0.4	1.2	0.5	11.7	0.5	32.7
2067	7.2	4.0	7.0	0.4	1.2	0.5	11.7	0.5	32.5
2068	7.2	4.0	6.9	0.4	1.2	0.5	11.7	0.5	32.4
2069	7.1	4.0	6.9	0.4	1.2	0.5	11.7	0.5	32.3
2070	7.1	3.9	6.9	0.4	1.2	0.5	11.6	0.5	32.2

Table 4e. Social budget revenue, per cent of GDP - Optimistic Scenario

Year	Social security contributions						State subsidies	Other revenue	Total revenue
	Paid by employers		Paid by insured						
	Actual	Imputed	Employees	Self-employed	Beneficiaries	Others			
	%								
2007	7.0	2.9	6.3	0.4	0.8	0.5	12.0	0.5	30.5
2008	7.0	2.9	6.3	0.4	0.8	0.5	11.7	0.5	30.1
2009	6.9	2.9	6.3	0.4	0.8	0.5	11.4	0.5	29.7
2010	6.8	2.9	6.2	0.4	0.8	0.5	11.2	0.5	29.4
2011	6.7	3.0	6.2	0.4	0.8	0.5	11.1	0.5	29.2
2012	6.6	3.0	6.1	0.4	0.8	0.5	11.0	0.5	29.0
2013	6.6	3.1	6.1	0.4	0.8	0.5	10.9	0.5	28.9
2014	6.6	3.2	6.1	0.4	0.8	0.5	10.8	0.5	28.9
2015	6.5	3.2	6.1	0.4	0.8	0.5	10.8	0.5	28.9
2016	6.5	3.3	6.1	0.4	0.8	0.5	10.9	0.5	29.0
2017	6.5	3.3	6.1	0.4	0.8	0.5	10.9	0.5	29.0
2018	6.5	3.4	6.1	0.4	0.8	0.5	10.9	0.6	29.1
2019	6.6	3.4	6.2	0.4	0.8	0.5	10.9	0.6	29.4
2020	6.6	3.5	6.2	0.4	0.8	0.5	11.0	0.6	29.6
2021	6.7	3.6	6.3	0.4	0.8	0.5	11.1	0.6	29.8
2022	6.7	3.6	6.3	0.4	0.8	0.5	11.2	0.6	30.1
2023	6.7	3.6	6.4	0.4	0.8	0.5	11.3	0.6	30.3
2024	6.8	3.7	6.5	0.4	0.8	0.5	11.4	0.6	30.7
2025	6.8	3.7	6.5	0.4	0.8	0.5	11.6	0.6	30.9
2026	6.9	3.7	6.6	0.4	0.8	0.5	11.7	0.6	31.2
2027	7.0	3.7	6.6	0.4	0.8	0.5	11.8	0.6	31.4
2028	7.0	3.7	6.7	0.4	0.8	0.5	12.0	0.6	31.6
2029	7.0	3.7	6.7	0.4	0.8	0.5	12.1	0.6	31.8
2030	7.1	3.7	6.8	0.4	0.8	0.5	12.1	0.6	31.9
2031	7.1	3.7	6.8	0.4	0.8	0.5	12.2	0.6	32.1
2032	7.1	3.6	6.8	0.4	0.8	0.5	12.3	0.6	32.1
2033	7.1	3.6	6.8	0.4	0.8	0.5	12.3	0.5	32.1
2034	7.1	3.6	6.8	0.4	0.8	0.5	12.3	0.5	32.1
2035	7.1	3.5	6.8	0.4	0.8	0.5	12.3	0.5	32.0
2036	7.1	3.5	6.8	0.4	0.8	0.5	12.3	0.5	32.0
2037	7.1	3.5	6.8	0.4	0.8	0.5	12.2	0.5	31.9
2038	7.1	3.4	6.8	0.4	0.8	0.5	12.2	0.5	31.7
2039	7.2	3.4	6.9	0.4	0.8	0.5	12.1	0.5	31.9
2040	7.2	3.4	6.9	0.4	0.8	0.5	12.0	0.5	31.8
2041	7.1	3.4	6.9	0.4	0.8	0.5	12.0	0.5	31.7
2042	7.1	3.3	6.9	0.4	0.8	0.5	12.0	0.5	31.7
2043	7.1	3.3	6.9	0.4	0.8	0.5	11.9	0.5	31.7
2044	7.1	3.3	6.9	0.4	0.8	0.5	11.9	0.5	31.6
2045	7.1	3.3	6.9	0.4	0.8	0.5	11.9	0.5	31.6
2046	7.1	3.3	6.9	0.4	0.8	0.5	12.0	0.5	31.5
2047	7.1	3.3	6.9	0.4	0.8	0.5	12.0	0.5	31.6
2048	7.1	3.3	6.9	0.4	0.8	0.5	12.0	0.5	31.6
2049	7.1	3.3	6.9	0.4	0.8	0.5	12.1	0.5	31.6
2050	7.0	3.3	6.8	0.4	0.8	0.5	12.1	0.5	31.5
2051	6.9	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.4
2052	6.9	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.4
2053	6.9	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.4
2054	6.9	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.4
2055	6.8	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.3
2056	6.8	3.3	6.7	0.4	0.8	0.5	12.2	0.5	31.2
2057	6.7	3.2	6.6	0.4	0.8	0.5	12.2	0.5	31.0
2058	6.7	3.2	6.5	0.4	0.8	0.5	12.2	0.5	30.9
2059	6.6	3.2	6.5	0.4	0.8	0.5	12.2	0.5	30.7
2060	6.5	3.2	6.4	0.4	0.8	0.5	12.1	0.5	30.4
2061	6.5	3.2	6.3	0.4	0.8	0.5	12.1	0.5	30.3
2062	6.4	3.1	6.2	0.4	0.8	0.5	12.0	0.5	30.0
2063	6.3	3.1	6.2	0.4	0.8	0.5	12.0	0.5	29.9
2064	6.3	3.1	6.1	0.4	0.8	0.5	11.9	0.5	29.6
2065	6.2	3.1	6.1	0.4	0.8	0.5	11.8	0.5	29.4
2066	6.2	3.0	6.0	0.4	0.8	0.5	11.8	0.5	29.2
2067	6.1	3.0	6.0	0.4	0.8	0.5	11.7	0.5	29.1
2068	6.1	3.0	6.0	0.4	0.7	0.5	11.7	0.5	28.9
2069	6.0	2.9	5.9	0.4	0.7	0.5	11.6	0.5	28.7
2070	6.0	2.9	5.9	0.4	0.7	0.5	11.6	0.5	28.5

Table 4f. Social budget revenue, per cent of GDP - Pessimistic Scenario

Year	Social security contributions						State subsidies	Other revenue	Total revenue
	Paid by employers		Paid by insured						
	Actual	Imputed	Employees	Self-employed	Beneficiaries	Others			
	%								
2007	7.0	2.9	6.4	0.4	0.9	0.5	12.2	0.5	30.8
2008	7.1	3.0	6.5	0.4	0.9	0.5	12.0	0.5	30.8
2009	7.2	3.0	6.5	0.4	0.9	0.5	11.8	0.5	30.9
2010	7.3	3.1	6.6	0.4	0.9	0.5	11.6	0.5	30.9
2011	7.3	3.1	6.6	0.4	0.9	0.5	11.5	0.5	30.9
2012	7.3	3.2	6.6	0.4	0.9	0.5	11.5	0.5	30.9
2013	7.2	3.3	6.6	0.4	0.9	0.5	11.4	0.5	30.7
2014	7.2	3.4	6.6	0.4	0.9	0.5	11.4	0.5	30.8
2015	7.2	3.5	6.6	0.4	0.9	0.5	11.3	0.5	30.9
2016	7.2	3.5	6.6	0.4	0.9	0.5	11.4	0.5	31.0
2017	7.2	3.6	6.6	0.4	0.9	0.5	11.3	0.5	31.1
2018	7.2	3.7	6.6	0.4	0.9	0.5	11.3	0.6	31.1
2019	7.2	3.8	6.7	0.4	0.9	0.5	11.2	0.6	31.3
2020	7.4	3.9	6.8	0.4	0.9	0.5	11.3	0.6	31.7
2021	7.4	4.0	6.8	0.4	0.9	0.5	11.2	0.6	31.8
2022	7.4	4.0	6.9	0.4	0.9	0.5	11.2	0.6	32.0
2023	7.5	4.1	6.9	0.4	0.9	0.5	11.2	0.6	32.1
2024	7.6	4.1	7.1	0.4	1.0	0.5	11.3	0.6	32.6
2025	7.6	4.2	7.1	0.4	1.0	0.5	11.3	0.6	32.7
2026	7.6	4.2	7.1	0.4	1.0	0.5	11.3	0.6	32.8
2027	7.7	4.3	7.2	0.4	1.0	0.5	11.4	0.6	33.0
2028	7.7	4.3	7.2	0.4	1.0	0.5	11.4	0.6	33.1
2029	7.7	4.3	7.1	0.4	1.0	0.5	11.5	0.6	33.1
2030	7.7	4.3	7.2	0.4	1.1	0.5	11.4	0.6	33.2
2031	7.7	4.3	7.2	0.4	1.1	0.5	11.5	0.6	33.2
2032	7.7	4.3	7.2	0.4	1.1	0.5	11.5	0.6	33.3
2033	7.7	4.3	7.2	0.4	1.1	0.5	11.5	0.5	33.3
2034	7.8	4.3	7.3	0.5	1.2	0.5	11.5	0.5	33.5
2035	7.7	4.3	7.3	0.5	1.2	0.5	11.5	0.5	33.5
2036	7.7	4.3	7.3	0.5	1.2	0.5	11.5	0.5	33.5
2037	7.7	4.3	7.2	0.5	1.2	0.5	11.5	0.5	33.5
2038	7.7	4.3	7.3	0.5	1.2	0.5	11.5	0.5	33.5
2039	7.8	4.3	7.3	0.5	1.2	0.5	11.4	0.5	33.7
2040	7.8	4.3	7.4	0.5	1.3	0.5	11.4	0.5	33.7
2041	7.8	4.3	7.4	0.5	1.3	0.5	11.4	0.5	33.7
2042	7.8	4.4	7.4	0.5	1.3	0.5	11.4	0.5	33.8
2043	7.8	4.4	7.4	0.5	1.3	0.5	11.4	0.5	33.8
2044	7.8	4.4	7.4	0.5	1.3	0.5	11.4	0.5	33.9
2045	7.8	4.5	7.4	0.5	1.3	0.5	11.4	0.5	33.9
2046	7.8	4.5	7.4	0.5	1.3	0.5	11.4	0.5	34.0
2047	7.9	4.5	7.4	0.5	1.4	0.5	11.4	0.5	34.2
2048	7.9	4.6	7.4	0.5	1.4	0.5	11.4	0.5	34.3
2049	7.8	4.6	7.4	0.5	1.4	0.5	11.4	0.5	34.3
2050	7.8	4.6	7.4	0.5	1.5	0.5	11.5	0.5	34.4
2051	7.8	4.7	7.4	0.5	1.5	0.5	11.5	0.5	34.5
2052	7.8	4.7	7.4	0.5	1.5	0.5	11.5	0.5	34.5
2053	7.8	4.7	7.4	0.5	1.5	0.5	11.5	0.5	34.5
2054	7.8	4.8	7.4	0.5	1.5	0.5	11.5	0.5	34.5
2055	7.7	4.8	7.4	0.5	1.5	0.5	11.5	0.5	34.5
2056	7.7	4.8	7.3	0.5	1.6	0.5	11.5	0.5	34.5
2057	7.7	4.8	7.3	0.5	1.6	0.5	11.5	0.5	34.4
2058	7.7	4.8	7.3	0.5	1.6	0.5	11.5	0.5	34.4
2059	7.6	4.8	7.3	0.5	1.6	0.5	11.4	0.5	34.3
2060	7.6	4.8	7.2	0.5	1.6	0.5	11.4	0.5	34.3
2061	7.6	4.9	7.2	0.5	1.7	0.5	11.4	0.5	34.2
2062	7.5	4.9	7.2	0.5	1.7	0.5	11.4	0.5	34.2
2063	7.5	4.9	7.1	0.5	1.7	0.5	11.4	0.5	34.1
2064	7.4	4.9	7.1	0.5	1.7	0.5	11.3	0.5	34.0
2065	7.3	4.9	7.0	0.5	1.7	0.5	11.3	0.5	33.8
2066	7.3	4.9	7.0	0.5	1.7	0.5	11.3	0.5	33.8
2067	7.3	4.9	7.0	0.5	1.7	0.5	11.3	0.5	33.7
2068	7.3	4.9	6.9	0.5	1.7	0.5	11.3	0.5	33.6
2069	7.2	4.9	6.9	0.5	1.8	0.5	11.2	0.5	33.6
2070	7.2	4.9	6.9	0.5	1.8	0.5	11.2	0.5	33.5

Table 4g. Beneficiaries and average system replacement rates - Baseline

Year	Equivalent pensioners		Retired civil servants		Unemployed		Long term care beneficiaries	
	Million	Replacement %	Million	Replacement %	Million	Replacement %	Million	Replacement %
2007	14,163	48.4	942	68.6	3,215	48.5	2,036	34.3
2008	14,237	47.6	968	68.1	2,997	47.0	2,041	35.4
2009	14,279	47.3	995	67.6	2,776	45.1	2,056	36.3
2010	14,296	46.9	1,022	67.1	2,554	45.5	2,081	36.9
2011	14,319	46.9	1,049	67.1	2,512	44.4	2,109	37.3
2012	14,373	47.1	1,075	67.0	2,467	43.4	2,127	37.7
2013	14,447	46.6	1,102	66.9	2,420	42.7	2,139	38.1
2014	14,535	46.6	1,129	66.9	2,371	42.2	2,154	38.4
2015	14,626	46.5	1,156	66.8	2,320	41.9	2,172	38.6
2016	14,720	46.4	1,176	66.8	2,268	41.7	2,186	38.9
2017	14,816	46.3	1,195	66.7	2,216	41.4	2,193	39.1
2018	14,894	46.2	1,215	66.7	2,162	41.2	2,197	39.2
2019	14,972	45.8	1,235	66.6	2,108	41.0	2,207	39.3
2020	15,057	45.8	1,254	66.6	2,052	40.8	2,220	39.2
2021	15,149	45.4	1,262	66.4	2,036	40.5	2,228	39.2
2022	15,258	45.2	1,270	66.2	2,019	40.2	2,230	39.1
2023	15,387	44.9	1,278	66.0	2,001	40.0	2,230	39.0
2024	15,526	44.6	1,287	65.8	1,982	39.8	2,238	39.0
2025	15,684	44.3	1,295	65.6	1,962	39.6	2,246	38.9
2026	15,859	43.8	1,288	65.3	1,941	39.4	2,250	38.8
2027	16,029	43.5	1,281	64.9	1,920	39.2	2,251	38.7
2028	16,192	43.1	1,274	64.5	1,900	39.0	2,251	38.5
2029	16,358	42.7	1,268	64.1	1,879	38.8	2,257	38.4
2030	16,538	42.0	1,261	63.8	1,860	38.7	2,260	38.5
2031	16,725	41.8	1,248	63.5	1,837	38.3	2,259	38.3
2032	16,889	41.5	1,235	63.2	1,816	37.9	2,258	38.2
2033	17,023	41.3	1,223	62.9	1,797	37.5	2,259	38.0
2034	17,124	41.1	1,210	62.6	1,780	37.1	2,264	37.9
2035	17,186	40.9	1,197	62.2	1,763	36.7	2,267	37.8
2036	17,216	40.8	1,189	62.1	1,748	36.3	2,269	37.6
2037	17,215	40.7	1,181	62.0	1,733	35.9	2,277	37.6
2038	17,188	40.6	1,174	61.9	1,720	35.4	2,290	37.5
2039	17,148	40.6	1,166	61.8	1,708	35.0	2,306	37.5
2040	17,103	40.6	1,158	61.7	1,696	34.6	2,326	37.4
2041	17,059	40.5	1,155	61.7	1,683	34.2	2,346	37.4
2042	17,011	40.5	1,152	61.8	1,670	33.8	2,366	37.4
2043	16,975	40.5	1,150	61.8	1,658	33.4	2,385	37.3
2044	16,944	40.4	1,147	61.9	1,646	33.1	2,403	37.3
2045	16,918	40.4	1,144	61.9	1,634	32.7	2,420	37.2
2046	16,892	40.3	1,142	62.1	1,622	32.3	2,435	37.2
2047	16,861	40.3	1,141	62.3	1,610	31.9	2,443	37.1
2048	16,809	40.2	1,139	62.5	1,598	31.6	2,444	37.1
2049	16,746	40.2	1,137	62.7	1,587	31.2	2,441	37.0
2050	16,675	40.2	1,136	62.9	1,576	30.8	2,431	36.9
2051	16,598	40.2	1,133	63.0	1,566	30.5	2,423	36.9
2052	16,514	40.2	1,130	63.2	1,556	30.2	2,409	36.9
2053	16,423	40.1	1,128	63.3	1,547	29.9	2,388	36.9
2054	16,319	40.1	1,125	63.5	1,538	29.6	2,361	36.9
2055	16,205	40.1	1,123	63.6	1,529	29.3	2,329	36.9
2056	16,072	40.1	1,118	63.7	1,521	29.0	2,290	36.9
2057	15,924	40.1	1,114	63.8	1,514	28.7	2,247	37.0
2058	15,768	40.2	1,110	63.8	1,506	28.4	2,197	37.0
2059	15,608	40.2	1,105	63.9	1,500	28.1	2,144	37.0
2060	15,448	40.3	1,101	64.0	1,494	27.8	2,088	37.0
2061	15,293	40.4	1,096	64.0	1,489	27.5	2,032	37.0
2062	15,145	40.4	1,092	64.0	1,483	27.2	1,976	37.0
2063	15,000	40.5	1,087	64.0	1,478	26.9	1,920	37.0
2064	14,855	40.5	1,083	64.0	1,474	26.6	1,866	37.0
2065	14,712	40.6	1,078	63.9	1,469	26.3	1,818	37.0
2066	14,569	40.7	1,073	64.0	1,466	26.0	1,776	37.0
2067	14,427	40.8	1,067	64.1	1,463	25.8	1,739	37.1
2068	14,286	40.9	1,062	64.1	1,460	25.5	1,706	37.1
2069	14,149	40.9	1,057	64.2	1,458	25.2	1,677	37.2
2070	14,015	41.0	1,051	64.3	1,456	24.9	1,651	37.2

Table 4h. Beneficiaries and average system replacement rates - Optimistic Scenario

Year	Equivalent pensioners		Retired civil servants		Unemployed		Long term care beneficiaries	
	Million	Replacement %	Million	Replacement %	Million	Replacement %	Million	Replacement %
2007	14,162	48.2	942	68.6	3,166	49.2	2,036	34.5
2008	14,235	47.1	968	68.1	2,899	47.4	2,041	35.8
2009	14,276	46.8	995	67.6	2,628	45.1	2,057	36.8
2010	14,292	46.4	1,022	67.1	2,356	46.5	2,082	37.5
2011	14,314	47.0	1,049	67.0	2,275	45.3	2,111	38.0
2012	14,366	46.8	1,075	66.9	2,191	44.4	2,129	38.4
2013	14,440	46.4	1,102	66.8	2,105	43.8	2,142	38.7
2014	14,528	46.3	1,129	66.7	2,017	43.3	2,159	39.0
2015	14,618	46.2	1,156	66.6	1,928	43.2	2,178	39.3
2016	14,713	46.1	1,176	66.6	1,838	43.2	2,194	39.5
2017	14,809	46.0	1,196	66.5	1,748	43.1	2,202	39.6
2018	14,887	45.9	1,215	66.4	1,658	43.2	2,208	39.7
2019	14,967	45.7	1,235	66.4	1,567	43.3	2,221	39.7
2020	15,053	45.4	1,254	66.3	1,475	43.5	2,236	39.4
2021	15,148	45.3	1,263	66.1	1,446	43.1	2,246	39.3
2022	15,260	45.1	1,271	65.9	1,417	42.7	2,250	39.2
2023	15,392	45.0	1,279	65.7	1,387	42.3	2,252	39.0
2024	15,536	44.8	1,288	65.5	1,356	41.9	2,261	38.8
2025	15,700	44.6	1,296	65.3	1,326	41.6	2,271	38.7
2026	15,881	44.4	1,289	64.9	1,295	41.3	2,277	38.6
2027	16,057	44.0	1,283	64.5	1,266	41.0	2,279	38.4
2028	16,228	43.9	1,277	64.1	1,237	40.6	2,281	38.3
2029	16,403	43.7	1,270	63.8	1,209	40.3	2,289	38.2
2030	16,593	43.2	1,264	63.4	1,183	40.0	2,293	38.4
2031	16,792	43.1	1,252	63.1	1,175	39.1	2,294	38.3
2032	16,967	42.6	1,240	62.8	1,168	38.3	2,294	38.2
2033	17,115	42.5	1,228	62.5	1,164	37.4	2,296	38.2
2034	17,231	42.2	1,216	62.2	1,161	36.5	2,303	38.2
2035	17,309	42.1	1,204	61.8	1,160	35.7	2,308	38.2
2036	17,357	42.1	1,198	61.7	1,160	34.8	2,312	38.3
2037	17,375	42.0	1,192	61.6	1,161	34.0	2,322	38.4
2038	17,370	42.0	1,186	61.5	1,163	33.1	2,336	38.5
2039	17,354	42.0	1,179	61.4	1,166	32.3	2,354	38.6
2040	17,336	42.0	1,173	61.4	1,168	31.6	2,376	38.7
2041	17,323	42.0	1,173	61.4	1,171	30.9	2,399	38.8
2042	17,308	42.0	1,174	61.5	1,173	30.2	2,421	38.8
2043	17,309	42.0	1,174	61.6	1,174	29.5	2,442	38.9
2044	17,320	42.0	1,174	61.6	1,176	28.8	2,463	38.9
2045	17,340	42.0	1,174	61.7	1,178	28.2	2,483	38.9
2046	17,362	42.1	1,177	61.9	1,179	27.6	2,500	38.9
2047	17,385	42.2	1,179	62.2	1,179	27.0	2,511	38.9
2048	17,390	42.1	1,182	62.4	1,180	26.4	2,515	38.8
2049	17,387	42.1	1,185	62.6	1,180	25.9	2,515	38.8
2050	17,378	42.2	1,187	62.9	1,181	25.4	2,509	38.7
2051	17,366	42.2	1,190	63.1	1,182	25.0	2,504	38.7
2052	17,349	42.3	1,192	63.2	1,184	24.5	2,494	38.7
2053	17,326	42.3	1,195	63.4	1,186	24.1	2,477	38.7
2054	17,291	42.3	1,198	63.6	1,189	23.6	2,455	38.8
2055	17,245	42.4	1,200	63.8	1,192	23.2	2,426	38.8
2056	17,180	42.4	1,201	63.9	1,195	22.8	2,393	38.9
2057	17,099	42.5	1,203	64.0	1,200	22.4	2,354	38.9
2058	17,008	42.8	1,204	64.1	1,205	22.1	2,310	39.0
2059	16,914	42.9	1,205	64.2	1,211	21.7	2,262	39.1
2060	16,818	43.2	1,206	64.3	1,218	21.4	2,212	39.2
2061	16,726	43.4	1,207	64.3	1,225	21.0	2,162	39.3
2062	16,640	43.5	1,208	64.3	1,232	20.7	2,113	39.4
2063	16,555	43.8	1,208	64.3	1,240	20.4	2,064	39.4
2064	16,470	43.9	1,209	64.3	1,249	20.1	2,017	39.5
2065	16,386	44.2	1,210	64.3	1,258	19.9	1,976	39.6
2066	16,300	44.4	1,210	64.3	1,268	19.6	1,941	39.7
2067	16,214	44.6	1,211	64.4	1,277	19.3	1,912	39.8
2068	16,128	44.8	1,211	64.5	1,287	19.1	1,887	39.9
2069	16,046	45.0	1,211	64.6	1,298	18.9	1,865	40.0
2070	15,966	45.3	1,211	64.6	1,308	18.6	1,848	40.1

Table 4i. Beneficiaries and average system replacement rates - Pessimistic Scenario

Year	Equivalent pensioners		Retired civil servants		Unemployed		Long term care beneficiaries	
	Million	Replacement %	Million	Replacement %	Million	Replacement %	Million	Replacement %
2007	14,163	48.5	942	68.6	3,425	45.5	2,036	34.1
2008	14,238	47.7	968	68.1	3,418	44.9	2,040	35.0
2009	14,280	47.4	995	67.6	3,407	44.1	2,056	35.6
2010	14,297	46.8	1,022	67.2	3,395	43.4	2,080	36.2
2011	14,320	46.7	1,049	67.1	3,392	42.4	2,108	36.6
2012	14,372	46.4	1,075	67.0	3,386	41.5	2,126	36.9
2013	14,445	45.9	1,102	67.0	3,377	40.8	2,137	37.2
2014	14,530	45.9	1,129	66.9	3,363	40.2	2,152	37.4
2015	14,618	45.8	1,156	66.9	3,347	39.8	2,170	37.6
2016	14,708	45.6	1,176	66.8	3,330	39.4	2,184	37.8
2017	14,799	45.5	1,195	66.8	3,311	39.0	2,191	37.9
2018	14,871	45.3	1,215	66.7	3,290	38.6	2,194	38.0
2019	14,943	45.2	1,234	66.7	3,266	38.1	2,204	38.1
2020	15,020	45.1	1,254	66.7	3,240	37.7	2,217	37.9
2021	15,103	44.5	1,262	66.5	3,211	37.5	2,225	37.9
2022	15,202	44.2	1,270	66.3	3,180	37.3	2,226	37.9
2023	15,319	43.9	1,278	66.1	3,147	37.2	2,226	37.8
2024	15,446	43.5	1,286	65.9	3,112	37.0	2,233	37.7
2025	15,590	43.1	1,294	65.8	3,076	36.8	2,241	37.7
2026	15,749	42.8	1,287	65.4	3,039	36.6	2,244	37.6
2027	15,903	42.5	1,280	65.0	3,002	36.4	2,244	37.5
2028	16,049	42.2	1,273	64.7	2,965	36.3	2,243	37.4
2029	16,197	42.0	1,266	64.3	2,929	36.1	2,248	37.4
2030	16,358	41.3	1,259	63.9	2,894	35.9	2,250	37.6
2031	16,525	41.1	1,246	63.6	2,853	35.6	2,248	37.5
2032	16,667	40.8	1,233	63.3	2,814	35.4	2,246	37.3
2033	16,780	40.6	1,220	63.0	2,780	35.2	2,245	37.3
2034	16,859	40.3	1,207	62.7	2,747	35.0	2,249	37.2
2035	16,900	40.2	1,194	62.4	2,717	34.7	2,251	37.1
2036	16,908	40.0	1,185	62.3	2,687	34.5	2,252	37.0
2037	16,885	39.9	1,176	62.2	2,659	34.3	2,259	37.0
2038	16,836	39.8	1,167	62.0	2,633	34.0	2,270	37.0
2039	16,773	39.7	1,158	61.9	2,607	33.8	2,285	37.0
2040	16,703	39.7	1,150	61.8	2,581	33.5	2,304	37.0
2041	16,634	39.6	1,145	61.8	2,553	33.3	2,323	36.9
2042	16,558	39.5	1,141	61.8	2,525	33.1	2,341	36.9
2043	16,492	39.4	1,137	61.9	2,496	32.8	2,359	36.8
2044	16,430	39.4	1,132	61.9	2,468	32.6	2,376	36.8
2045	16,371	39.3	1,128	61.9	2,438	32.4	2,392	36.7
2046	16,309	39.2	1,124	62.1	2,408	32.2	2,405	36.6
2047	16,242	39.1	1,120	62.3	2,377	32.0	2,411	36.5
2048	16,152	39.0	1,115	62.5	2,346	31.8	2,411	36.4
2049	16,050	38.9	1,111	62.6	2,315	31.7	2,406	36.3
2050	15,939	38.9	1,107	62.8	2,285	31.5	2,395	36.1
2051	15,822	38.8	1,101	62.9	2,255	31.4	2,384	36.0
2052	15,696	38.8	1,096	63.1	2,226	31.2	2,368	36.0
2053	15,563	38.7	1,090	63.2	2,197	31.1	2,345	36.0
2054	15,419	38.6	1,084	63.3	2,169	31.0	2,317	35.9
2055	15,264	38.6	1,079	63.4	2,142	30.8	2,281	35.9
2056	15,092	38.5	1,071	63.5	2,115	30.7	2,241	35.9
2057	14,906	38.5	1,063	63.5	2,089	30.5	2,195	35.8
2058	14,713	38.4	1,055	63.6	2,064	30.4	2,142	35.8
2059	14,518	38.4	1,047	63.7	2,039	30.3	2,086	35.8
2060	14,323	38.4	1,039	63.7	2,015	30.1	2,027	35.8
2061	14,134	38.4	1,030	63.7	1,992	30.0	1,968	35.7
2062	13,952	38.4	1,021	63.7	1,968	29.8	1,909	35.7
2063	13,774	38.4	1,013	63.6	1,945	29.7	1,850	35.6
2064	13,598	38.4	1,004	63.6	1,922	29.5	1,792	35.6
2065	13,424	38.3	995	63.6	1,899	29.4	1,740	35.5
2066	13,252	38.3	986	63.6	1,877	29.2	1,694	35.5
2067	13,080	38.3	976	63.7	1,856	29.1	1,653	35.4
2068	12,912	38.3	967	63.7	1,835	28.9	1,617	35.4
2069	12,748	38.3	957	63.8	1,814	28.8	1,583	35.4
2070	12,588	38.3	948	63.8	1,793	28.6	1,553	35.3

Table 4j. Hospital days, outpatient visits, medical supplies, long-term care cases – Baseline

Year	Expenditure health insurance and care insurance		Inpatient hospital days		Outpatient visits		Defined Daily Doses		Long term care (Million)	
	Total (billion)	Share in function health (%)	Million	Per insured	Million	Per insured	Million	Per insured	In-patients	Out-patients
2007	172.8	68.9	145	2	1,179	17	28,311	404	1,399	637
2008	179.2	69.4	142	2	1,180	17	28,419	407	1,404	637
2009	187.3	70.1	140	2	1,182	17	28,533	409	1,415	641
2010	194.2	70.7	138	2	1,184	17	28,670	412	1,430	651
2011	201.6	71.2	138	2	1,185	17	28,794	415	1,446	663
2012	209.2	71.8	138	2	1,186	17	28,900	418	1,457	670
2013	216.8	72.3	139	2	1,186	17	28,996	420	1,464	675
2014	224.7	72.8	139	2	1,187	17	29,082	423	1,474	680
2015	232.8	73.3	139	2	1,186	17	29,176	426	1,486	687
2016	241.0	73.8	139	2	1,186	17	29,254	429	1,494	692
2017	249.3	74.2	139	2	1,185	17	29,310	431	1,499	694
2018	257.7	74.7	139	2	1,183	17	29,357	433	1,502	695
2019	266.4	75.1	139	2	1,182	18	29,396	436	1,509	699
2020	274.4	75.6	138	2	1,179	18	29,428	438	1,516	704
2021	281.9	75.9	138	2	1,178	18	29,432	440	1,521	707
2022	289.1	76.3	137	2	1,178	18	29,331	440	1,523	707
2023	296.3	76.7	136	2	1,177	18	29,237	441	1,523	707
2024	303.8	77.1	136	2	1,177	18	29,144	441	1,528	710
2025	311.4	77.5	135	2	1,177	18	29,052	441	1,532	714
2026	319.0	77.9	134	2	1,176	18	28,961	441	1,534	716
2027	326.9	78.3	134	2	1,177	18	28,873	442	1,534	717
2028	334.9	78.7	134	2	1,177	18	28,797	442	1,534	717
2029	343.3	79.0	133	2	1,177	18	28,720	442	1,538	719
2030	352.5	79.4	133	2	1,178	18	28,643	442	1,541	720
2031	362.6	79.7	133	2	1,175	18	28,577	442	1,541	718
2032	373.7	80.1	133	2	1,173	18	28,581	444	1,543	716
2033	385.3	80.5	133	2	1,169	18	28,584	445	1,545	713
2034	397.5	80.8	132	2	1,166	18	28,580	447	1,551	713
2035	410.0	81.1	132	2	1,163	18	28,568	448	1,556	712
2036	422.9	81.5	132	2	1,159	18	28,560	449	1,560	709
2037	436.4	81.8	131	2	1,155	18	28,555	451	1,567	710
2038	450.4	82.1	131	2	1,151	18	28,542	452	1,576	713
2039	464.8	82.4	130	2	1,146	18	28,519	454	1,588	718
2040	479.6	82.8	130	2	1,142	18	28,483	455	1,601	725
2041	494.9	83.1	129	2	1,137	18	28,436	456	1,614	732
2042	510.6	83.4	129	2	1,132	18	28,380	457	1,627	739
2043	526.8	83.7	129	2	1,127	18	28,308	457	1,638	746
2044	543.1	84.0	128	2	1,122	18	28,216	458	1,650	753
2045	560.0	84.2	128	2	1,116	18	28,102	458	1,660	760
2046	577.4	84.5	128	2	1,110	18	27,969	458	1,669	766
2047	594.7	84.8	128	2	1,104	18	27,816	457	1,673	770
2048	611.7	85.0	127	2	1,096	18	27,631	457	1,673	771
2049	628.7	85.2	127	2	1,088	18	27,412	455	1,670	771
2050	644.9	85.4	126	2	1,080	18	27,162	454	1,663	768
2051	661.2	85.6	125	2	1,072	18	26,892	452	1,656	767
2052	677.1	85.8	124	2	1,065	18	26,578	449	1,646	763
2053	692.8	85.9	123	2	1,057	18	26,246	446	1,632	756
2054	708.5	86.0	123	2	1,048	18	25,895	443	1,614	748
2055	724.1	86.2	122	2	1,040	18	25,527	439	1,592	736
2056	739.8	86.3	121	2	1,031	18	25,157	435	1,568	723
2057	755.4	86.4	120	2	1,022	18	24,794	431	1,540	707
2058	771.0	86.4	119	2	1,014	18	24,439	428	1,509	689
2059	786.7	86.5	118	2	1,005	18	24,089	424	1,475	668
2060	802.5	86.6	116	2	996	18	23,744	420	1,441	647
2061	818.8	86.6	115	2	988	18	23,413	417	1,406	625
2062	835.6	86.7	114	2	980	18	23,096	413	1,373	604
2063	852.9	86.8	113	2	972	17	22,791	410	1,339	582
2064	870.8	86.8	112	2	964	17	22,507	407	1,306	560
2065	889.7	86.9	111	2	957	17	22,236	404	1,277	541
2066	909.7	87.0	110	2	950	17	21,975	401	1,251	525
2067	930.7	87.0	109	2	944	17	21,724	398	1,229	510
2068	952.8	87.1	108	2	937	17	21,479	396	1,209	498
2069	975.8	87.2	107	2	931	17	21,241	393	1,191	486
2070	999.9	87.3	106	2	926	17	21,004	390	1,175	476

Table 4k. Hospital days, outpatient visits, medical supplies, long-term care cases – Optimistic Scenario

Year	Expenditure health insurance and care insurance		Inpatient hospital days		Outpatient visits		Defined Daily Doses		Long term care (Million)	
	Total (billion)	Share in function health (%)	Million	Per insured	Million	Per insured	Million	Per insured	In-patients	Out-patients
2007	173.2	68.8	145	2	1,180	17	28,312	404	1,399	637
2008	180.5	69.4	142	2	1,182	17	28,423	406	1,405	637
2009	190.2	70.2	141	2	1,185	17	28,542	408	1,416	641
2010	198.7	70.7	139	2	1,188	17	28,700	411	1,431	651
2011	207.9	71.3	139	2	1,190	17	28,832	413	1,448	663
2012	217.4	72.0	140	2	1,193	17	28,949	415	1,459	670
2013	227.2	72.6	140	2	1,196	17	29,064	417	1,467	675
2014	237.4	73.2	141	2	1,199	17	29,175	419	1,478	681
2015	248.0	73.8	141	2	1,202	17	29,302	420	1,491	687
2016	258.9	74.4	141	2	1,204	17	29,420	422	1,501	693
2017	270.0	75.0	142	2	1,207	17	29,522	423	1,507	695
2018	281.5	75.5	142	2	1,210	17	29,620	424	1,512	696
2019	293.4	76.1	142	2	1,213	17	29,712	425	1,520	700
2020	304.8	76.6	142	2	1,215	17	29,803	426	1,530	705
2021	315.6	77.1	142	2	1,219	17	29,870	426	1,537	709
2022	326.3	77.5	142	2	1,222	17	29,830	425	1,541	709
2023	337.2	77.9	141	2	1,225	17	29,790	424	1,543	709
2024	348.5	78.3	141	2	1,228	17	29,744	423	1,549	712
2025	360.1	78.7	140	2	1,231	17	29,693	422	1,555	716
2026	372.1	79.1	140	2	1,234	17	29,636	420	1,558	719
2027	384.5	79.4	139	2	1,236	18	29,580	419	1,560	719
2028	397.4	79.8	139	2	1,239	18	29,534	418	1,562	719
2029	411.0	80.2	139	2	1,242	18	29,486	417	1,567	722
2030	425.9	80.5	139	2	1,245	18	29,437	416	1,570	723
2031	442.1	80.9	139	2	1,245	18	29,400	415	1,572	721
2032	460.1	81.3	139	2	1,244	18	29,434	415	1,575	719
2033	479.3	81.7	139	2	1,244	18	29,471	415	1,579	717
2034	499.6	82.1	139	2	1,244	17	29,502	415	1,586	717
2035	520.9	82.5	139	2	1,244	17	29,531	415	1,592	716
2036	543.3	82.8	139	2	1,245	17	29,566	415	1,598	714
2037	567.1	83.2	139	2	1,245	17	29,608	415	1,607	715
2038	592.2	83.6	139	2	1,245	17	29,644	415	1,618	718
2039	618.4	84.0	139	2	1,246	17	29,671	414	1,630	724
2040	645.8	84.3	139	2	1,246	17	29,688	414	1,645	731
2041	674.4	84.7	139	2	1,247	17	29,696	413	1,660	739
2042	704.2	85.1	139	2	1,247	17	29,699	412	1,675	746
2043	735.2	85.4	140	2	1,248	17	29,692	411	1,688	754
2044	767.2	85.8	140	2	1,248	17	29,669	410	1,702	761
2045	800.5	86.1	140	2	1,248	17	29,629	409	1,714	768
2046	835.2	86.4	140	2	1,248	17	29,574	407	1,725	775
2047	870.4	86.7	140	2	1,247	17	29,502	405	1,732	779
2048	906.0	87.0	141	2	1,246	17	29,400	403	1,735	781
2049	942.3	87.2	140	2	1,243	17	29,267	401	1,734	781
2050	978.1	87.5	140	2	1,241	17	29,106	398	1,730	779
2051	1,015.0	87.7	140	2	1,239	17	28,924	395	1,726	778
2052	1,052.1	87.9	140	2	1,237	17	28,698	391	1,719	775
2053	1,090.0	88.0	139	2	1,235	17	28,453	387	1,708	769
2054	1,128.8	88.2	139	2	1,232	17	28,188	383	1,693	762
2055	1,168.6	88.3	138	2	1,229	17	27,906	379	1,675	751
2056	1,209.6	88.5	138	2	1,226	17	27,620	374	1,654	739
2057	1,251.7	88.6	137	2	1,223	17	27,341	370	1,630	724
2058	1,295.1	88.7	137	2	1,221	16	27,072	366	1,603	707
2059	1,340.2	88.8	137	2	1,218	16	26,808	362	1,574	688
2060	1,387.0	89.0	136	2	1,216	16	26,549	358	1,544	668
2061	1,435.9	89.1	136	2	1,214	16	26,305	354	1,514	648
2062	1,487.3	89.2	135	2	1,213	16	26,075	350	1,485	628
2063	1,541.2	89.3	135	2	1,211	16	25,860	346	1,456	607
2064	1,597.9	89.5	134	2	1,211	16	25,667	343	1,429	588
2065	1,658.0	89.6	134	2	1,211	16	25,487	339	1,405	571
2066	1,721.8	89.7	134	2	1,211	16	25,320	336	1,385	556
2067	1,789.3	89.9	133	2	1,211	16	25,163	333	1,368	544
2068	1,860.5	90.0	133	2	1,213	16	25,017	330	1,353	533
2069	1,935.4	90.1	133	2	1,214	16	24,882	327	1,341	524
2070	2,014.6	90.3	133	2	1,216	16	24,750	324	1,331	517

Table 4l. Hospital days, outpatient visits, medical supplies, long-term care cases – Pessimistic Scenario

Year	Expenditure health insurance and care insurance		Inpatient hospital days		Outpatient visits		Defined Daily Doses		Long term care (Million)	
	Total (billion)	Share in function health (%)	Million	Per insured	Million	Per insured	Million	Per insured	In-patients	Out-patients
2007	172.3	68.9	145	2	1,179	17	28,310	404	1,399	637
2008	178.2	69.5	142	2	1,180	17	28,417	407	1,404	637
2009	185.4	70.2	140	2	1,181	17	28,528	410	1,415	641
2010	191.7	70.7	137	2	1,182	17	28,654	413	1,430	651
2011	198.5	71.3	138	2	1,182	17	28,775	416	1,445	662
2012	205.4	71.8	138	2	1,183	17	28,878	419	1,456	670
2013	212.3	72.3	138	2	1,183	17	28,969	422	1,463	674
2014	219.5	72.8	138	2	1,182	17	29,051	425	1,473	680
2015	226.8	73.3	138	2	1,182	17	29,140	428	1,484	686
2016	234.1	73.8	138	2	1,180	17	29,213	431	1,493	691
2017	241.6	74.2	138	2	1,179	17	29,264	434	1,497	694
2018	249.0	74.6	138	2	1,176	18	29,306	436	1,500	695
2019	256.7	75.1	138	2	1,174	18	29,339	439	1,506	698
2020	263.7	75.5	137	2	1,171	18	29,365	442	1,514	703
2021	270.1	75.9	137	2	1,170	18	29,363	444	1,519	707
2022	276.1	76.2	136	2	1,168	18	29,254	445	1,520	707
2023	282.1	76.5	135	2	1,166	18	29,148	446	1,519	706
2024	288.2	76.9	134	2	1,164	18	29,038	446	1,523	709
2025	294.4	77.2	133	2	1,162	18	28,927	447	1,527	713
2026	300.6	77.6	133	2	1,161	18	28,813	448	1,528	716
2027	306.9	77.9	132	2	1,159	18	28,700	449	1,528	716
2028	313.3	78.2	132	2	1,157	18	28,596	450	1,527	716
2029	320.0	78.5	131	2	1,155	18	28,489	451	1,530	718
2030	327.6	78.8	131	2	1,153	18	28,380	452	1,532	718
2031	336.0	79.1	130	2	1,148	18	28,280	453	1,531	717
2032	345.4	79.5	130	2	1,143	18	28,250	456	1,531	714
2033	355.2	79.8	130	2	1,138	18	28,219	458	1,533	712
2034	365.4	80.1	129	2	1,132	18	28,182	460	1,537	712
2035	375.9	80.5	129	2	1,126	19	28,139	463	1,541	710
2036	386.6	80.8	128	2	1,121	19	28,101	465	1,544	707
2037	397.8	81.1	128	2	1,115	19	28,066	468	1,551	708
2038	409.4	81.4	127	2	1,108	19	28,023	471	1,559	711
2039	421.2	81.7	126	2	1,102	19	27,967	473	1,569	716
2040	433.3	82.0	126	2	1,095	19	27,898	476	1,581	723
2041	445.6	82.3	125	2	1,088	19	27,817	478	1,593	730
2042	458.1	82.6	125	2	1,081	19	27,726	480	1,604	737
2043	470.8	82.9	124	2	1,074	19	27,618	482	1,615	744
2044	483.5	83.1	124	2	1,066	19	27,491	484	1,625	751
2045	496.5	83.4	123	2	1,057	19	27,340	485	1,634	757
2046	509.7	83.6	123	2	1,049	19	27,171	486	1,642	763
2047	522.6	83.9	122	2	1,040	19	26,980	487	1,645	766
2048	535.0	84.1	121	2	1,030	19	26,755	488	1,644	767
2049	547.1	84.2	121	2	1,019	19	26,497	488	1,639	767
2050	558.2	84.4	120	2	1,007	19	26,209	488	1,631	764
2051	569.1	84.5	119	2	997	19	25,898	487	1,622	762
2052	579.4	84.7	117	2	986	19	25,544	486	1,611	758
2053	589.4	84.8	116	2	974	19	25,170	484	1,594	751
2054	599.0	84.8	115	2	962	19	24,776	482	1,575	742
2055	608.4	84.9	114	2	950	19	24,363	480	1,551	730
2056	617.5	85.0	112	2	938	19	23,947	477	1,525	716
2057	626.3	85.0	111	2	926	19	23,537	475	1,495	700
2058	635.0	85.0	110	2	914	19	23,135	473	1,462	681
2059	643.4	85.1	108	2	901	19	22,737	470	1,426	660
2060	651.8	85.1	107	2	889	19	22,343	468	1,389	638
2061	660.2	85.1	105	2	877	19	21,963	466	1,353	616
2062	668.8	85.1	104	2	865	19	21,598	464	1,316	593
2063	677.6	85.1	103	2	854	19	21,244	462	1,280	570
2064	686.5	85.1	101	2	843	19	20,911	460	1,244	548
2065	696.0	85.1	100	2	832	19	20,592	459	1,212	528
2066	706.0	85.1	98	2	821	19	20,285	457	1,184	510
2067	716.5	85.2	97	2	811	19	19,986	456	1,159	495
2068	727.4	85.2	96	2	801	18	19,695	455	1,136	481
2069	738.7	85.2	95	2	791	18	19,411	453	1,115	468
2070	750.5	85.3	93	2	782	18	19,129	452	1,096	457

Table 4m. Age-related health system utilization rates, male - Baseline

Year	Age groups																			
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
	Male probabilities of contacting the health system																			
2010	0.352	0.084	0.077	0.085	0.092	0.089	0.111	0.121	0.133	0.160	0.206	0.240	0.362	0.355	0.416	0.495	0.594	0.633	1.002	1.002
2020	0.350	0.083	0.076	0.083	0.091	0.088	0.110	0.120	0.130	0.157	0.196	0.225	0.332	0.333	0.381	0.469	0.561	0.600	0.959	0.959
2030	0.348	0.083	0.075	0.081	0.087	0.083	0.106	0.115	0.126	0.150	0.172	0.206	0.282	0.316	0.341	0.405	0.481	0.521	0.803	0.803
2040	0.348	0.083	0.075	0.079	0.083	0.079	0.103	0.113	0.123	0.147	0.156	0.196	0.255	0.315	0.324	0.372	0.431	0.444	0.686	0.686
2050	0.348	0.083	0.075	0.079	0.082	0.078	0.102	0.112	0.122	0.147	0.148	0.190	0.240	0.308	0.318	0.363	0.419	0.429	0.653	0.653
2060	0.348	0.083	0.075	0.079	0.082	0.078	0.102	0.112	0.122	0.146	0.146	0.187	0.238	0.300	0.320	0.358	0.415	0.433	0.662	0.662
2070	0.348	0.083	0.075	0.079	0.082	0.078	0.102	0.112	0.122	0.147	0.144	0.183	0.235	0.291	0.323	0.355	0.413	0.428	0.658	0.658

Table 4n. Contribution assessment ceilings and contribution rates – Baseline

Year	Contribution assessment ceiling (Beitragsbemessungsgrenze)					Contribution rate				Average wage	
	Pension & unemployment		Health			Pens.	Health	Care	UI	Civ. serv.	contrib.
	€	Mult. avg. w.	€	% of pens. ceil.	Mult. avg. wage	%				€	
2007	63,000	2.0	42,750	67.9	1.34	19.9	14.6	1.9	3.6	34,641	31,823
2008	64,500	2.0	43,760	67.8	1.34	19.9	14.8	2.0	3.3	35,415	32,572
2009	66,100	2.0	44,860	67.9	1.34	19.9	14.9	2.0	2.7	36,266	33,395
2010	67,800	2.0	46,010	67.9	1.34	19.9	14.9	2.1	2.4	37,149	34,251
2011	69,800	2.0	47,370	67.9	1.34	19.2	14.9	2.1	2.3	38,190	35,262
2012	71,900	2.0	48,780	67.8	1.34	19.1	14.8	2.1	2.2	39,270	36,311
2013	74,100	2.0	50,240	67.8	1.34	18.9	14.7	2.2	2.1	40,389	37,400
2014	76,300	2.0	51,760	67.8	1.34	18.9	14.7	2.2	2.0	41,549	38,531
2015	78,600	2.0	53,340	67.9	1.34	18.9	14.7	2.3	2.0	42,753	39,706
2016	81,000	2.0	54,980	67.9	1.34	18.9	14.7	2.3	1.9	44,001	40,927
2017	83,500	2.0	56,680	67.9	1.34	18.9	14.7	2.3	1.9	45,297	42,195
2018	86,100	2.0	58,450	67.9	1.34	19.3	14.7	2.3	1.9	46,641	43,513
2019	88,800	2.0	60,290	67.9	1.34	19.6	14.7	2.3	1.8	48,036	44,883
2020	91,600	2.0	62,210	67.9	1.34	19.9	14.7	2.4	1.8	49,484	46,307
2021	94,000	2.0	63,860	67.9	1.34	20.0	14.7	2.4	1.8	50,734	47,539
2022	96,500	2.0	65,560	67.9	1.34	20.2	14.7	2.4	1.8	52,015	48,802
2023	99,100	2.0	67,300	67.9	1.34	20.5	14.7	2.4	1.8	53,326	50,097
2024	101,700	2.0	69,080	67.9	1.34	20.6	14.7	2.4	1.8	54,669	51,425
2025	104,400	2.0	70,910	67.9	1.34	21.0	14.7	2.4	1.9	56,044	52,787
2026	107,200	2.0	72,790	67.9	1.34	21.2	15.1	2.5	1.9	57,452	54,183
2027	110,000	2.0	74,710	67.9	1.34	21.5	15.1	2.5	1.9	58,894	55,614
2028	112,900	2.0	76,680	67.9	1.34	21.7	15.1	2.5	1.9	60,371	57,082
2029	115,900	2.0	78,700	67.9	1.34	21.9	15.1	2.5	1.9	61,882	58,586
2030	119,000	2.0	80,780	67.9	1.34	22.0	15.6	2.5	1.9	63,430	60,128
2031	123,100	2.0	83,570	67.9	1.34	22.0	15.6	2.5	1.9	65,516	62,210
2032	127,400	2.0	86,460	67.9	1.34	22.0	15.6	2.5	2.0	67,671	64,364
2033	131,800	2.0	89,460	67.9	1.34	22.0	15.6	2.6	2.0	69,896	66,592
2034	136,400	2.0	92,550	67.9	1.34	22.0	15.6	2.6	2.0	72,194	68,896
2035	141,100	2.0	95,760	67.9	1.34	22.0	16.2	2.6	2.0	74,566	71,280
2036	146,000	2.0	99,070	67.9	1.34	22.0	16.2	2.6	2.0	77,017	73,745
2037	151,000	2.0	102,490	67.9	1.34	22.0	16.2	2.6	2.0	79,547	76,296
2038	156,200	2.0	106,040	67.9	1.34	22.0	16.2	2.6	2.0	82,160	78,934
2039	161,600	2.0	109,700	67.9	1.34	22.0	16.2	2.7	2.0	84,858	81,662
2040	167,200	2.0	113,500	67.9	1.34	22.0	16.2	2.7	2.0	87,645	84,485
2041	173,000	2.0	117,420	67.9	1.34	22.0	16.2	2.7	2.0	90,522	87,405
2042	179,000	2.0	121,470	67.9	1.34	22.0	16.2	2.8	2.0	93,494	90,425
2043	185,200	2.0	125,670	67.9	1.34	22.0	16.2	2.8	2.0	96,562	93,548
2044	191,600	2.0	130,010	67.9	1.34	22.0	16.7	2.9	2.0	99,730	96,779
2045	198,200	2.0	134,500	67.9	1.34	22.0	16.7	2.9	2.0	103,002	100,122
2046	205,000	2.0	139,140	67.9	1.34	22.0	16.7	2.9	2.0	106,380	103,578
2047	212,100	2.0	143,950	67.9	1.34	22.0	16.7	2.9	2.0	109,869	107,154
2048	219,400	2.0	148,920	67.9	1.34	22.0	16.7	3.0	2.0	113,471	110,852
2049	227,000	2.0	154,050	67.9	1.34	22.0	16.7	3.0	2.0	117,191	114,677
2050	234,800	2.0	159,370	67.9	1.34	22.0	16.7	3.0	2.0	121,032	118,634
2051	242,300	2.0	164,450	67.9	1.34	22.0	16.7	3.0	2.0	124,699	122,417
2052	250,000	2.0	169,700	67.9	1.34	22.0	16.7	3.0	2.0	128,477	126,321
2053	258,000	2.0	175,110	67.9	1.34	22.0	16.7	2.9	2.0	132,370	130,350
2054	266,200	2.0	180,690	67.9	1.34	22.0	16.7	2.9	2.0	136,380	134,507
2055	274,700	2.0	186,460	67.9	1.34	22.0	16.7	2.9	2.0	140,512	138,796
2056	283,500	2.0	192,400	67.9	1.34	22.0	16.7	2.9	2.0	144,769	143,223
2057	292,500	2.0	198,540	67.9	1.34	22.0	16.7	2.8	2.0	149,155	147,790
2058	301,800	2.0	204,870	67.9	1.34	22.0	16.7	2.8	2.0	153,673	152,503
2059	311,400	2.0	211,400	67.9	1.34	22.0	16.7	2.7	2.0	158,329	157,367
2060	321,300	2.0	218,140	67.9	1.34	22.0	16.6	2.7	2.0	163,126	162,385
2061	331,600	2.0	225,100	67.9	1.34	22.0	16.5	2.6	2.0	168,068	167,564
2062	342,200	2.0	232,280	67.9	1.34	22.0	16.5	2.6	2.0	173,160	172,907
2063	353,100	2.0	239,690	67.9	1.34	22.0	16.5	2.5	2.0	178,406	178,422
2064	364,400	2.0	247,330	67.9	1.34	22.0	16.5	2.4	2.0	183,811	184,112
2065	376,000	2.0	255,220	67.9	1.34	22.0	16.4	2.4	2.0	189,380	189,983
2066	388,000	2.0	263,360	67.9	1.34	22.0	16.3	2.3	2.0	195,117	196,042
2067	400,400	2.0	271,760	67.9	1.34	22.0	16.2	2.3	2.0	201,028	202,294
2068	413,200	2.0	280,420	67.9	1.34	22.0	16.1	2.2	2.1	207,119	208,745
2069	426,400	2.0	289,370	67.9	1.34	22.0	16.0	2.2	2.1	213,394	215,402
2070	440,000	2.0	298,590	67.9	1.34	22.0	16.0	2.2	2.1	219,859	222,271

Table 4o. Contribution assessment ceilings and contribution rates – Optimistic Scenario

Year	Contribution assessment ceiling (Beitragsbemessungsgrenze)					Contribution rate				Average wage	
	Pension & unemployment		Health			Pens.	Health	Care	UI	Civ. serv.	contrib.
	€	Mult. avg. w.	€	% of pens. ceil.	Mult. avg. wage				%		€
2007	63,000	2.0	42,750	67.9	1.34	19.9	14.6	1.9	3.6	34,623	31,811
2008	64,800	2.0	43,950	67.8	1.34	19.9	14.8	2.0	3.2	35,547	32,704
2009	66,900	2.0	45,360	67.8	1.34	19.9	15.0	2.1	2.5	36,632	33,755
2010	69,200	2.0	46,940	67.8	1.34	18.9	15.0	2.1	2.1	37,845	34,931
2011	71,800	2.0	48,730	67.9	1.34	18.8	14.8	2.1	2.0	39,213	36,261
2012	74,600	2.0	50,600	67.8	1.34	18.7	14.7	2.2	1.8	40,640	37,650
2013	77,500	2.0	52,550	67.8	1.34	18.6	14.7	2.2	1.7	42,129	39,102
2014	80,500	2.0	54,590	67.8	1.34	18.6	14.7	2.2	1.6	43,683	40,620
2015	83,600	2.0	56,720	67.8	1.34	18.6	14.7	2.3	1.5	45,303	42,206
2016	86,900	2.0	58,950	67.8	1.34	18.6	14.7	2.3	1.4	46,995	43,865
2017	90,300	2.0	61,280	67.9	1.34	18.6	14.6	2.3	1.3	48,761	45,600
2018	93,900	2.0	63,720	67.9	1.34	18.7	14.6	2.3	1.2	50,605	47,415
2019	97,700	2.0	66,270	67.8	1.34	19.4	14.6	2.3	1.2	52,530	49,314
2020	101,600	2.0	68,940	67.9	1.34	19.4	14.6	2.3	1.1	54,541	51,301
2021	105,200	2.0	71,380	67.9	1.34	19.5	14.6	2.3	1.1	56,370	53,112
2022	108,900	2.0	73,900	67.9	1.34	19.6	14.6	2.3	1.0	58,260	54,987
2023	112,700	2.0	76,500	67.9	1.34	19.7	14.6	2.3	1.0	60,212	56,926
2024	116,700	2.0	79,200	67.9	1.34	19.9	14.6	2.3	1.0	62,229	58,933
2025	120,800	2.0	81,990	67.9	1.34	20.0	14.6	2.3	1.0	64,313	61,010
2026	125,100	2.0	84,880	67.8	1.34	20.3	14.6	2.3	1.0	66,465	63,159
2027	129,500	2.0	87,870	67.9	1.34	20.3	14.6	2.3	1.0	68,688	65,383
2028	134,100	2.0	90,960	67.8	1.34	20.5	14.6	2.3	0.9	70,984	67,684
2029	138,800	2.0	94,160	67.8	1.34	20.6	14.6	2.3	0.9	73,356	70,065
2030	143,700	2.0	97,470	67.8	1.34	20.6	14.6	2.3	0.9	75,806	72,528
2031	149,900	2.0	101,650	67.8	1.34	21.0	14.6	2.4	0.9	78,893	75,637
2032	156,300	2.0	106,000	67.8	1.34	21.0	14.6	2.4	0.9	82,105	78,878
2033	163,000	2.0	110,540	67.8	1.34	21.2	14.6	2.4	0.9	85,447	82,258
2034	170,000	2.0	115,280	67.8	1.34	21.3	14.6	2.4	0.9	88,924	85,782
2035	177,300	2.0	120,220	67.8	1.34	21.3	14.6	2.4	0.9	92,543	89,456
2036	184,900	2.0	125,370	67.8	1.34	21.4	15.2	2.4	0.9	96,307	93,287
2037	192,800	2.0	130,730	67.8	1.34	21.4	15.2	2.4	0.9	100,225	97,281
2038	201,100	2.0	136,330	67.8	1.34	21.4	15.2	2.4	0.9	104,300	101,445
2039	209,700	2.0	142,160	67.8	1.34	21.4	15.2	2.5	0.9	108,541	105,787
2040	218,700	2.0	148,250	67.8	1.34	21.4	15.2	2.5	0.9	112,954	110,313
2041	228,100	2.0	154,590	67.8	1.34	21.4	15.2	2.5	0.9	117,545	115,033
2042	237,900	2.0	161,200	67.8	1.34	21.4	15.2	2.5	0.9	122,321	119,954
2043	248,100	2.0	168,100	67.8	1.34	21.4	15.2	2.6	0.9	127,291	125,084
2044	258,700	2.0	175,290	67.8	1.34	21.4	15.2	2.6	0.9	132,462	130,433
2045	269,800	2.0	182,780	67.7	1.34	21.3	15.2	2.6	0.9	137,843	136,010
2046	281,300	2.0	190,590	67.8	1.34	21.1	15.2	2.6	0.9	143,440	141,823
2047	293,300	2.0	198,740	67.8	1.34	21.1	15.2	2.6	0.9	149,264	147,885
2048	305,800	2.0	207,230	67.8	1.34	21.1	15.2	2.6	0.9	155,324	154,204
2049	318,900	2.0	216,090	67.8	1.34	21.1	15.2	2.6	0.9	161,628	160,793
2050	332,500	2.0	225,320	67.8	1.34	21.1	15.2	2.7	0.9	168,187	167,661
2051	345,900	2.0	234,380	67.8	1.34	21.1	15.9	2.7	0.9	174,611	174,402
2052	359,800	2.0	243,800	67.8	1.34	21.1	15.9	2.7	0.9	181,280	181,414
2053	374,300	2.0	253,600	67.8	1.34	21.1	15.9	2.7	0.9	188,204	188,707
2054	389,400	2.0	263,800	67.7	1.34	21.1	15.9	2.7	0.9	195,392	196,294
2055	405,000	2.0	274,400	67.8	1.34	21.1	15.8	2.6	0.9	202,855	204,186
2056	421,300	2.0	285,430	67.7	1.34	21.1	15.8	2.6	0.9	210,603	212,395
2057	438,200	2.0	296,910	67.8	1.34	20.7	15.8	2.6	0.9	218,646	220,934
2058	455,800	2.0	308,850	67.8	1.34	20.7	15.7	2.6	0.9	226,997	229,817
2059	474,100	2.0	321,260	67.8	1.34	20.5	15.7	2.5	0.9	235,667	239,056
2060	493,200	2.0	334,180	67.8	1.34	20.3	15.7	2.5	0.9	244,668	248,667
2061	513,000	2.0	347,610	67.8	1.34	20.3	15.7	2.4	0.9	254,013	258,664
2062	533,600	2.0	361,590	67.8	1.34	20.0	15.7	2.4	0.9	263,714	269,064
2063	555,100	2.0	376,130	67.8	1.34	20.0	15.7	2.3	1.0	273,787	279,881
2064	577,400	2.0	391,250	67.8	1.34	19.8	15.7	2.3	1.0	284,243	291,133
2065	600,600	2.0	406,980	67.8	1.34	19.6	15.7	2.2	1.0	295,100	302,838
2066	624,700	2.0	423,340	67.8	1.34	19.5	15.7	2.2	1.0	306,370	315,013
2067	649,800	2.0	440,360	67.8	1.34	19.4	15.7	2.2	1.0	318,072	327,677
2068	675,900	2.0	458,060	67.8	1.34	19.2	15.7	2.2	1.0	330,220	340,851
2069	703,100	2.0	476,480	67.8	1.34	19.0	15.7	2.1	1.1	342,832	354,555
2070	731,400	2.0	495,640	67.8	1.34	18.9	15.7	2.1	1.1	355,926	368,809

Table 4p. Contribution assessment ceilings and contribution rates – Pessimistic Scenario

Year	Contribution assessment ceiling (Beitragsbemessungsgrenze)					Contribution rate				Average wage	
	Pension & unemployment		Health			Pens.	Health	Care	UI	Civ. serv.	contrib.
	€	Mult. avg. w.	€	% of pens. ceil.	Mult. avg. wage	%				€	
2007	63,000	2.0	42,750	67.9	1.34	19.9	14.6	1.9	3.6	34,650	31,819
2008	64,400	2.0	43,710	67.9	1.34	19.9	14.8	2.0	3.9	35,392	32,536
2009	65,900	2.0	44,750	67.9	1.34	20.0	15.0	2.0	3.8	36,186	33,305
2010	67,400	2.0	45,790	67.9	1.34	20.0	15.0	2.1	3.7	36,987	34,081
2011	69,200	2.0	47,040	68.0	1.34	20.0	14.9	2.1	3.6	37,945	35,010
2012	71,100	2.0	48,330	68.0	1.34	20.0	14.9	2.1	3.6	38,936	35,972
2013	73,100	2.0	49,670	67.9	1.34	19.7	14.9	2.2	3.6	39,963	36,971
2014	75,100	2.0	51,060	68.0	1.34	19.7	14.9	2.2	3.5	41,025	38,006
2015	77,200	2.0	52,500	68.0	1.34	19.7	14.9	2.2	3.5	42,126	39,079
2016	79,400	2.0	54,000	68.0	1.34	19.7	14.9	2.3	3.6	43,267	40,193
2017	81,700	2.0	55,550	68.0	1.34	19.7	14.9	2.3	3.6	44,448	41,348
2018	84,100	2.0	57,160	68.0	1.34	19.7	14.9	2.3	3.5	45,672	42,547
2019	86,600	2.0	58,840	67.9	1.34	20.0	14.9	2.3	3.5	46,941	43,791
2020	89,100	2.0	60,570	68.0	1.34	20.8	14.9	2.4	3.5	48,256	45,082
2021	91,200	2.0	61,970	67.9	1.34	20.9	14.9	2.4	3.6	49,317	46,126
2022	93,300	2.0	63,400	68.0	1.34	21.2	14.9	2.4	3.6	50,400	47,192
2023	95,500	2.0	64,870	67.9	1.34	21.4	15.2	2.4	3.6	51,504	48,280
2024	97,700	2.0	66,360	67.9	1.34	21.8	15.2	2.5	3.6	52,630	49,391
2025	99,900	2.0	67,880	67.9	1.34	21.9	15.2	2.5	3.6	53,778	50,525
2026	102,200	2.0	69,440	67.9	1.34	22.0	15.2	2.5	3.6	54,949	51,683
2027	104,500	2.0	71,030	68.0	1.34	22.0	15.8	2.5	3.6	56,142	52,865
2028	106,900	2.0	72,650	68.0	1.34	22.0	15.8	2.6	3.7	57,359	54,071
2029	109,300	2.0	74,300	68.0	1.34	22.0	15.8	2.6	3.7	58,599	55,302
2030	111,800	2.0	75,990	68.0	1.34	22.0	16.3	2.6	3.7	59,864	56,557
2031	115,400	2.0	78,450	68.0	1.34	22.0	16.3	2.7	3.7	61,708	58,392
2032	119,200	2.0	81,000	68.0	1.34	22.0	16.3	2.7	3.7	63,609	60,285
2033	123,100	2.0	83,620	67.9	1.34	22.0	16.3	2.7	3.7	65,568	62,239
2034	127,100	2.0	86,330	67.9	1.34	22.0	16.9	2.7	3.8	67,586	64,256
2035	131,200	2.0	89,130	67.9	1.34	22.0	16.9	2.7	3.8	69,667	66,338
2036	135,500	2.0	92,020	67.9	1.34	22.0	16.9	2.8	3.8	71,811	68,488
2037	139,900	2.0	95,000	67.9	1.34	22.0	16.9	2.8	3.8	74,021	70,706
2038	144,400	2.0	98,070	67.9	1.34	22.0	16.9	2.8	3.8	76,299	72,996
2039	149,100	2.0	101,250	67.9	1.34	22.0	17.5	2.9	3.9	78,646	75,360
2040	153,900	2.0	104,530	67.9	1.34	22.0	17.5	2.9	3.9	81,065	77,800
2041	158,900	2.0	107,910	67.9	1.34	22.0	17.5	3.0	3.9	83,558	80,318
2042	164,000	2.0	111,400	67.9	1.34	22.0	17.5	3.0	3.9	86,127	82,918
2043	169,300	2.0	115,010	67.9	1.34	22.0	17.5	3.1	3.9	88,775	85,601
2044	174,800	2.0	118,730	67.9	1.34	22.0	17.5	3.1	3.9	91,503	88,371
2045	180,500	2.0	122,570	67.9	1.34	22.0	17.5	3.2	3.9	94,315	91,229
2046	186,300	2.0	126,540	67.9	1.34	22.0	17.5	3.2	4.0	97,213	94,180
2047	192,300	2.0	130,630	67.9	1.34	22.0	18.0	3.2	4.0	100,200	97,226
2048	198,500	2.0	134,850	67.9	1.34	22.0	18.0	3.2	4.0	103,278	100,369
2049	204,900	2.0	139,210	67.9	1.34	22.0	18.0	3.3	4.0	106,449	103,614
2050	211,500	2.0	143,710	67.9	1.34	22.0	18.0	3.3	4.0	109,718	106,963
2051	217,700	2.0	147,910	67.9	1.34	22.0	18.0	3.3	4.0	112,767	110,091
2052	224,100	2.0	152,240	67.9	1.34	22.0	18.0	3.3	4.1	115,900	113,311
2053	230,700	2.0	156,690	67.9	1.34	22.0	18.0	3.3	4.1	119,120	116,625
2054	237,400	2.0	161,270	67.9	1.34	22.0	18.0	3.3	4.1	122,430	120,036
2055	244,300	2.0	165,990	67.9	1.34	22.0	18.0	3.3	4.2	125,831	123,547
2056	251,500	2.0	170,850	67.9	1.34	22.0	18.0	3.2	4.2	129,327	127,160
2057	258,800	2.0	175,840	67.9	1.34	22.0	18.0	3.2	4.2	132,920	130,878
2058	266,400	2.0	180,980	67.9	1.34	22.0	18.0	3.2	4.2	136,613	134,706
2059	274,200	2.0	186,280	67.9	1.34	22.0	18.0	3.1	4.3	140,408	138,645
2060	282,200	2.0	191,720	67.9	1.34	22.0	18.0	3.0	4.3	144,308	142,699
2061	290,500	2.0	197,330	67.9	1.34	22.0	18.0	3.0	4.3	148,317	146,872
2062	299,000	2.0	203,100	67.9	1.34	22.0	18.0	2.9	4.3	152,437	151,167
2063	307,700	2.0	209,040	67.9	1.34	22.0	18.0	2.8	4.3	156,672	155,587
2064	316,700	2.0	215,150	67.9	1.34	22.0	18.0	2.8	4.4	161,024	160,136
2065	326,000	2.0	221,440	67.9	1.34	22.0	18.0	2.8	4.4	165,497	164,819
2066	335,500	2.0	227,920	67.9	1.34	22.0	18.0	2.7	4.5	170,094	169,638
2067	345,300	2.0	234,580	67.9	1.34	22.0	18.0	2.6	4.5	174,818	174,598
2068	355,400	2.0	241,440	67.9	1.34	22.0	18.0	2.6	4.6	179,674	179,703
2069	365,800	2.0	248,500	67.9	1.34	22.0	17.9	2.6	4.6	184,665	184,957
2070	376,500	2.0	255,760	67.9	1.34	22.0	17.8	2.5	4.7	189,794	190,364

Table 4q. Social budget by age groups of population – Baseline

Function of social budget	2010	2020	2030	2040	2050	2060	2070
	Per cent of GDP						
Family	3.9	3.6	3.8	4.3	4.5	4.7	4.8
Age group 0-19	2.8	2.5	2.7	3.0	3.1	3.3	3.3
Age group 20-64	1.2	1.1	1.1	1.3	1.3	1.4	1.4
Age group 65+							
Health	10.5	10.5	10.9	11.0	11.0	10.4	9.6
Age group 0-19	1.1	0.9	0.9	0.9	0.9	0.9	0.9
Age group 20-64	4.9	4.6	4.1	3.7	3.6	3.4	3.3
Age group 65+	4.6	4.9	5.9	6.4	6.5	6.0	5.4
Employment	1.4	1.1	1.0	0.9	0.8	0.7	0.6
Age group 0-19							
Age group 20-64	1.4	1.1	1.0	0.9	0.8	0.7	0.6
Age group 65+							
Old age and survivors	11.3	12.1	13.4	14.3	14.5	14.2	13.4
Age group 0-19	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 20-64	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 65+	10.9	11.7	13.0	13.9	14.1	13.7	13.0
Political events	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64							
Age group 65+	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Housing	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Age group 0-19	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 20-64	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Age group 65+	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Promotion of savings	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 65+							
General social aid	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 0-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Age group 20-64	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 65+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Per cent of GDP						
Total social budget	28.2	28.0	29.9	31.3	31.6	30.7	29.2
Age group 0-19	4.1	3.7	3.9	4.3	4.4	4.6	4.6
Age group 20-64	8.4	7.4	6.9	6.5	6.3	6.1	6.0
Age group 65+	15.7	16.8	19.1	20.6	20.8	20.0	18.6
Share of age groups in the social budget	*Per cent of total social budget*						
Age group 0-19	14.7	13.4	13.0	13.6	14.0	14.8	15.8
Age group 20-64	29.6	26.6	23.1	20.8	20.1	20.0	20.4
Age group 65+	55.7	60.1	63.9	65.7	65.9	65.2	63.8

Table 4r. Social budget by age groups of population - Optimistic scenario

Function of social budget	2010	2020	2030	2040	2050	2060	2070
	Per cent of GDP						
Family	3.9	4.0	4.9	5.1	5.4	5.6	5.5
Age group 0-19	2.7	2.8	3.4	3.6	3.8	3.9	3.8
Age group 20-64	1.2	1.2	1.5	1.5	1.6	1.7	1.6
Age group 65+							
Health	10.4	10.1	10.0	9.6	9.1	8.3	7.4
Age group 0-19	1.1	1.0	1.1	1.0	1.1	1.0	1.0
Age group 20-64	4.8	4.4	3.8	3.4	3.3	3.0	2.9
Age group 65+	4.5	4.6	5.2	5.2	4.8	4.2	3.5
Employment	1.3	0.8	0.6	0.5	0.4	0.3	0.3
Age group 0-19							
Age group 20-64	1.3	0.8	0.6	0.5	0.4	0.3	0.3
Age group 65+							
Old age and survivors	11.1	11.7	12.8	12.5	12.4	11.8	10.9
Age group 0-19	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 20-64	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 65+	10.7	11.4	12.4	12.2	12.0	11.4	10.6
Political events	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64							
Age group 65+	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Housing	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Age group 0-19	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Age group 20-64	0.4	0.4	0.4	0.3	0.3	0.3	0.4
Age group 65+	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Promotion of savings	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 65+							
General social aid	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 0-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Age group 20-64	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 65+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Per cent of GDP						
Total social budget	27.7	27.4	29.1	28.5	28.1	26.9	24.9
Age group 0-19	4.1	4.1	4.9	5.0	5.2	5.4	5.2
Age group 20-64	8.2	7.1	6.5	6.0	5.9	5.6	5.4
Age group 65+	15.5	16.2	17.8	17.5	17.0	15.9	14.3
Share of age groups in the social budget	*Per cent of total social budget*						
Age group 0-19	14.7	15.1	16.7	17.5	18.5	20.0	20.8
Age group 20-64	29.5	25.9	22.2	21.0	20.9	21.0	21.8
Age group 65+	55.8	59.0	61.1	61.5	60.7	59.0	57.3

Table 4s. Social budget by age groups of population - Pessimistic scenario

Function of social budget	2010	2020	2030	2040	2050	2060	2070
	Per cent of GDP						
Family	4.0	3.7	3.7	3.6	3.6	3.6	3.6
Age group 0-19	2.8	2.6	2.6	2.5	2.5	2.5	2.5
Age group 20-64	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Age group 65+							
Health	10.7	11.1	11.7	12.0	12.4	12.2	11.8
Age group 0-19	1.1	1.0	0.9	0.8	0.8	0.8	0.7
Age group 20-64	5.0	4.8	4.4	4.0	3.9	3.8	3.7
Age group 65+	4.7	5.2	6.4	7.3	7.7	7.7	7.4
Employment	1.9	1.6	1.6	1.4	1.4	1.3	1.2
Age group 0-19							
Age group 20-64	1.9	1.6	1.6	1.4	1.4	1.3	1.2
Age group 65+							
Old age and survivors	11.6	12.7	14.1	15.2	16.0	16.1	15.9
Age group 0-19	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 20-64	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Age group 65+	11.2	12.3	13.7	14.7	15.5	15.6	15.4
Political events	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64							
Age group 65+	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Housing	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Age group 0-19	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 20-64	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Age group 65+	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Promotion of savings	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 0-19							
Age group 20-64	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Age group 65+							
General social aid	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 0-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Age group 20-64	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Age group 65+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Per cent of GDP						
Total social budget	29.2	30.0	31.8	33.1	34.2	34.0	33.3
Age group 0-19	4.2	3.9	3.8	3.7	3.7	3.6	3.6
Age group 20-64	8.9	8.3	7.7	7.2	7.0	6.8	6.6
Age group 65+	16.1	17.8	20.3	22.2	23.5	23.6	23.1
Share of age groups in the social budget	*Per cent of total social budget*						
Age group 0-19	14.4	13.0	11.9	11.1	10.7	10.7	10.8
Age group 20-64	30.5	27.7	24.2	21.6	20.5	20.0	19.9
Age group 65+	55.1	59.3	64.0	67.3	68.8	69.3	69.3