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Four long-term scenarios for the Dutch government and health-care sector

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Abstract

This study presents four long-term scenarios for government and health-care services in the Netherlands. In 2001, the expenditure on government and health-care services (including pharmaceuticals) was about 24% of Dutch GDP. According to all scenarios, this will increase to between 29% and 33% of Dutch GDP in 2040. Partly due to relatively low productivity growth, the share in national employment will increase from 22% to 28-31% in 2040.

Expenditure on government services (public administration, defence and subsidised education) as a percentage of GDP increase in the public scenarios and decrease in the two more market-oriented scenarios. However, due to higher growth rates of GDP per capita, the growth of government services per capita is only marginally smaller in the market-oriented scenarios than in the more public scenarios.

Ageing and advances in medical technology are major driving factors of the growth in expenditure on health care in all scenarios. Expenditure on health care in the two market scenarios are about 1% of GDP higher than in the two public scenarios. Volume growth of health care is 2.4% per year, twice as high as in the public scenario with lowest growth.

Key words: Long run, scenarios, government services, public administration, defence, education, health care, productivity, ageing, Baumol's cost disease model, government finance

JEL-codes: H5, I5

Samenvatting

Deze studie beschrijft vier lange-termijnscenario's voor twee Nederlandse bedrijfstakken: de overheid en de zorg. Uitgaven aan overheidsdiensten en zorg (inclusief geneesmiddelen) bedroegen in 2001 24% van het Bruto Binnenlands Product. In alle scenario's zal dit aandeel stijgen, variërend van 29% BBP tot 33% BBP in 2040.

In de meer collectieve scenario's zullen de uitgaven aan overheidsdiensten (openbaar bestuur, defensie en gesubsidieerd onderwijs) als percentage van het BBP toenemen, terwijl die in de markt-georienteerde scenario's daarentegen afnemen. De economische groei per hoofd is echter veel hoger in de markt-georienteerde scenario's. Vandaar dat in deze scenario's het volume van de overheidsdiensten per hoofd nauwelijks lager is dan in de meer collectieve scenario's.

Vergrijzing en voorschrijdende medische technologie zorgen voor extra uitgaven aan zorg. In de markt-georienteerde scenario's stijgen de zorguitgaven ongeveer 1% BBP meer dan in de collectieve scenario's. Volumegroei van de zorg per hoofd is zelfs bijna tweemaal zo hoog als in het collectieve scenario met relatief lage groei.

Contents

Preface

In the CPB-study *Vier vergezichten op Nederland* ('Four Futures of the Netherlands'; Huizinga and Smid, 2004), four scenarios are presented for the development of the Dutch economy until 2040. In this paper, the development of the sectors government (public administration, defence and subsidised education) and health care (including pharmaceuticals) are discussed.

Both sectors are of great economic importance in the Netherlands. In terms of value added, they constitute about one fifth of the Dutch economy. In terms of employment and final consumption even about one quarter is involved. Furthermore, these sectors have in common that they are mainly financed publicly (by social security contributions and taxes) and that productivity growth is relatively slow. Baumol's cost disease model suggests that this can lead to increasing pressure on public finance and to negative effects for economic growth and inflation.

The research was carried out by Frits Bos, Rudy Douven and Esther Mot. They collaborated intensively with the principal authors of the long run study on the Dutch economy, Free Huizinga and Bert Smid. Statistical assistance, comments and suggestions were received from Rob Euwals, Adriaan van Hien, Marco Lighthart, Rocus van Opstal, Hans Roodenburg, Martin Vromans and Dinand Webbink.

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Summary

In the CPB-study *Vier vergezichten op Nederland* ('Four futures of the Netherlands'), four scenarios are presented for the development of the Dutch economy until 2040. Scenarios are internally consistent views of the future. The scenarios for the Netherlands differ with respect to population growth, ageing, labour participation, the growth of labour productivity and the development in the various sectors. Such comprehensive and coherent views on the future can serve as a frame of reference for strategic policy issues.

This study describes the development of the sectors government (public administration, defence and subsidised education) and health care in the four scenarios for the Netherlands. These sectors constitute about 20% of Dutch GDP and 25% of employment. They are also important for Dutch government finance, as government and health-care services are mainly financed by taxes and social-security contributions. Compared to 1960, the share of government and health care has increased considerably. The cost disease model of Baumol suggests that relatively low productivity growth in government and health care will further raise both types of expenditures.

The scenarios are defined in terms of two groups of 'key uncertainties'. The first concerns *national institutions*: to what extent will the mix of public and private responsibilities change? The second key uncertainty concerns *international cooperation*: to what extent are national states willing and able to cooperate in Europe and at a world wide scale?

The scenarios *Regional Communities* and *Strong Europe* will be labelled as public scenarios. In these scenarios, reform of public arrangements is relatively minor and the importance of solidarity and equity is stressed. The scenarios *Transatlantic Market* and *Global Economy* are labelled as market scenarios, and have a larger preference for private initiatives and favour a more limited role of the government.

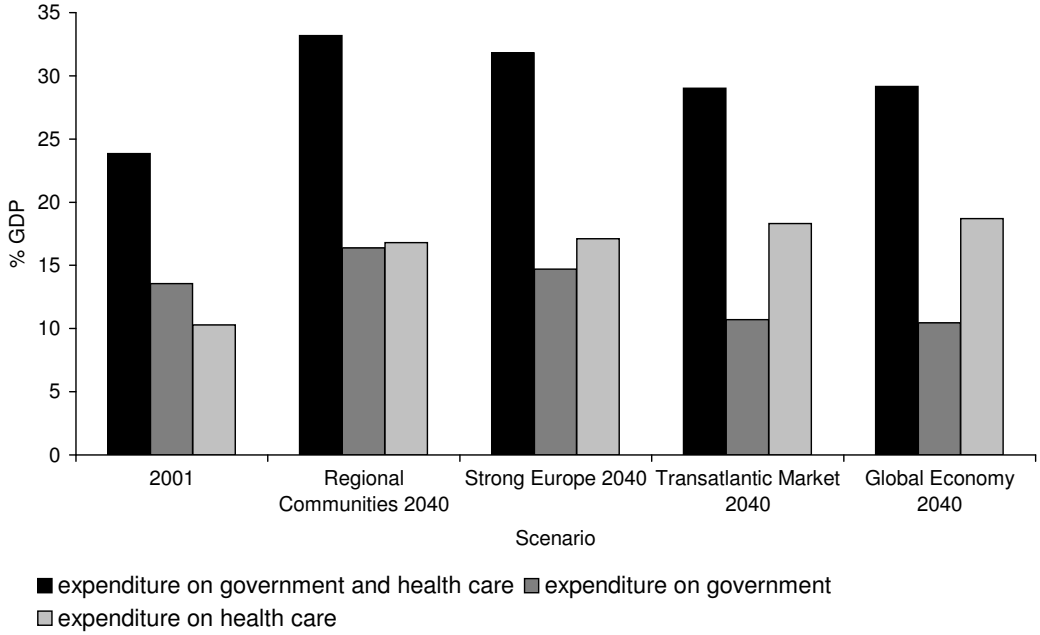
Government services

The final consumption expenditure on the services of the government (public administration, defence and subsidised education) will grow in the public scenarios from 13.6% GDP in 2001 to about 15 or 16% GDP in 2040. In *Regional Communities,* the relative importance of public administration will increase; this is partly compensated by lower expenditure on education, in particular due to a decline in the number of pupils and students. In *Strong Europe,* the relative size of public administration will grow less and at more selected areas. In this scenario, expenditure on defence and education will increase; the latter is mainly due to demography.

The two market scenarios show an entirely different development for government services: a decrease from 13.6% GDP in 2001 to 11% GDP in 2004. In *Transatlantic Market* and *Global Economy,* the role of the services provided by the government is more limited, substantial savings are attained on administrative costs and school fees are raised. In *Global Economy,* the

number of pupils and students substantially increases. Like in the United States, private, non-subsidised, institutes will play a major role in higher education.

Expenditure on government services and health care as a percentage of GDP

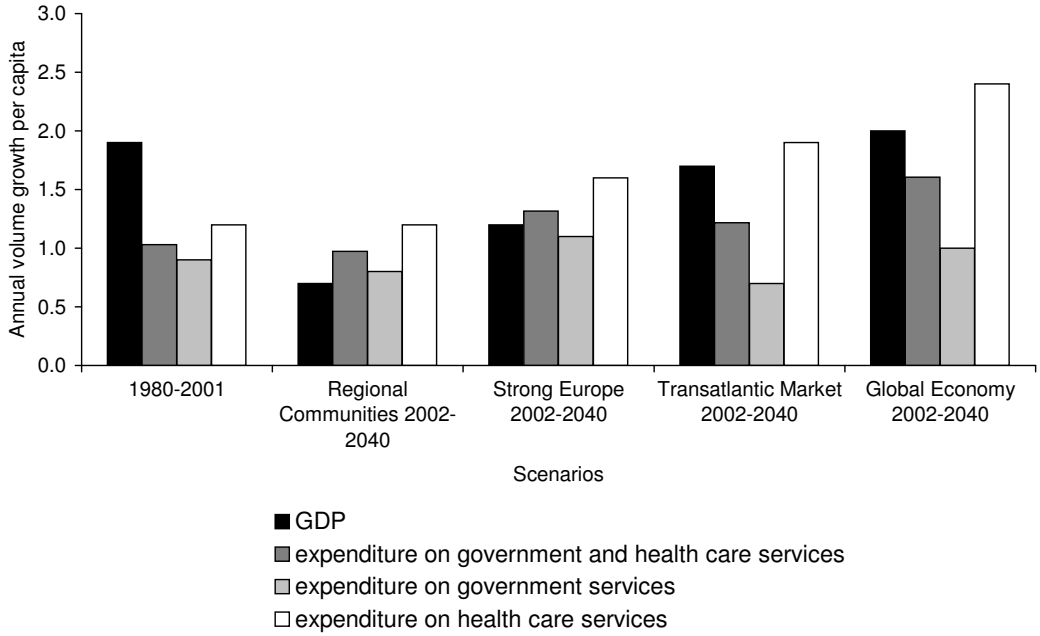


The growth rate per capita is the highest in the public scenario *Strong Europe* (1.1% per year). However, due to differences in productivity and participation, this growth rate is hardly higher than the 1.0% in the market scenario *Global Economy*. In the public scenario *Regional Communities,* the growth rate of government services per capita is even lower (0.8%) and almost equal to that in the other market oriented scenario (*Transatlantic Market*: 0.7%).

Health care

In all four scenarios, expenditure on health care as a percentage of GDP will increase, from 10.3% in 2001 to between 16.8% (*Strong Europe*) and 18.7% (*Global Economy*) in 2040. Ageing and progress in medical technology are major driving factors behind this growth. Ageing does not only increase expenditure on health-care services, but also substantially alters its composition. Progress in medical technology is potentially even a more important driving factor than ageing. However, the impact of medical technology on expenditure on health care depends also on the economic growth and the role of public arrangements. More economic growth increases the income available for consuming new technology. Citizens and patients will be willing to spend a substantial part of their increase in material welfare on better health care. Lower economic growth reduces the financial means for new medical technology, in particular when public arrangements play a dominant role.

Annual volume growth per capita



In all four scenarios, the growth of labour productivity in the sector health care lags behind that in the market sector. This raises the relative price of health-care services and contributes also to an increasing claim on GDP.

In both market scenarios *Transatlantic Market* and *Global Economy,* economic growth per capita is highest. In these scenarios, the expenditure on health care as a percentage of GDP are about 1% of GDP higher than in both public two scenarios. In both market scenarios, volume growth of health-care services per capita, in particular of private health care, is substantially higher. Growth per capita in *Global Economy* is 2.4%, even twice as high as in *Regional Communities*.

The rising claims of health care on GDP combined with relatively low productivity growth leads to substantial increases in their share of employment, i.e. from 10.8% in 2001 to between 16.4% (*Regional Communities*) and 18.5% (*Global Economy*) in 2040.

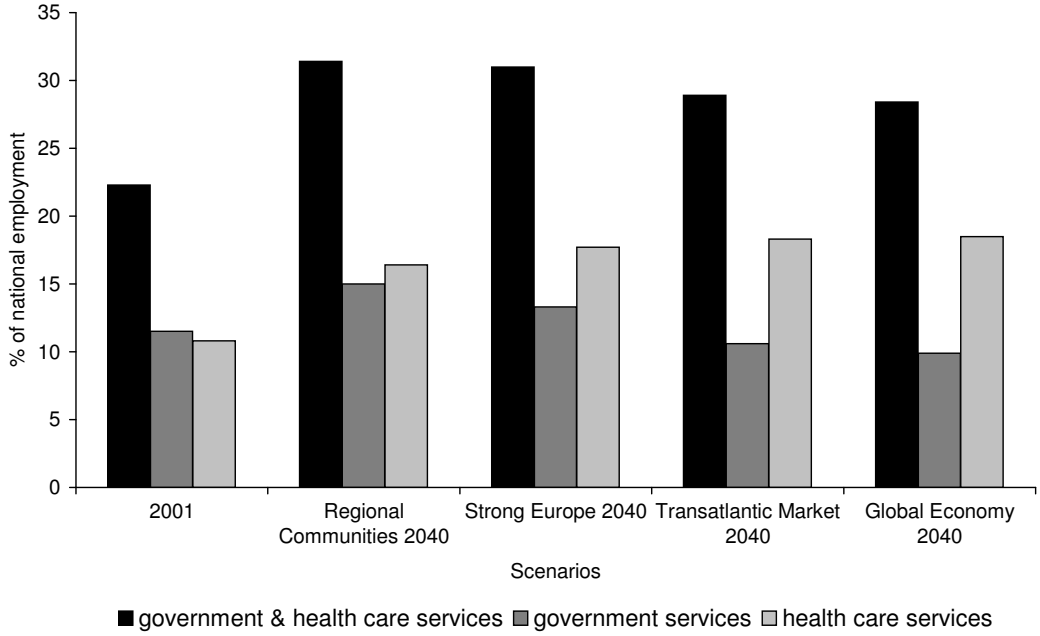
Total of government and health care

In 2001, the final consumption of government and health-care services (including pharmaceuticals) was about 24% of Dutch GDP. According to all scenarios, this will increase to between 29% (the market scenario *Global Economy*) and 33% of Dutch GDP in 2040 (the public scenario *Regional Communities*).

In all scenarios, there is a negative correlation between government expenditure and expenditure on health care. In the market scenarios, government expenditure, as percentage of GDP, decreases, but this is fully compensated by a rapid growth of expenditure on health care. In the public scenarios, government expenditure increases, but this is partly compensated

through slower growth of expenditure on health care. This negative correlation limits in all scenarios the increase in the total claim of government services and health care on GDP.

Share of government and health-care services in national employment



In the market-oriented scenarios, the increase in government expenditure on government services and health care, i.e. the increase in pressure on government finance, is smaller for two reasons. Firstly, in the market-oriented scenarios the increase in government services and health care is smaller as a percentage of GDP. Secondly, in the market-oriented scenarios there is more, rapidly growing, privately financed health care.

In terms of employment, the size of government and health-care services increases from 22% in 2001 to between 28% (*Global Economy*) and 31% (the public scenarios *Regional Communities* and *Strong Europe*).

1 Introduction

The CPB[1] started developing long-term scenarios in 1992. The study 'Scanning the Future' (CPB, 1992a) presented four long-term scenarios for the world economy, based on a thorough assessment of current trends, strengths and weaknesses. The study 'The Netherlands in triple' (CPB, 1992b) translated and elaborated these scenarios for the Dutch economy.

Long-term scenario-analysis by the CPB is a synthesis between quantitative economic modelling (e.g. by Tinbergen) and qualitative trend analysis (e.g. the work by Malthus, Ricardo, Marx and Schumpeter). Its purpose is to provide a frame of reference for strategic policy decision-making by identifying key-uncertainties, trade-offs and potential bottlenecks and by showing a possible range of outcomes. Major features of this approach are:

- Uncertainty is grappled by identifying key-uncertainties and sketching consistent alternative worlds;
- Knowledge about general trends, stylised facts and economic behaviour is included;
- Quantification is illustrative. The scenarios are plausible outcomes and tell stories about a possible future. They are not predictions of the future and reflect to a substantial extent science as an art.

Since 2003, a new set of scenario-analyses have been published by the CPB. In the study *Four Futures of Europe* (de Mooij and Tang (2003)), four scenarios are sketched for the development of the European economy until 2040. The scenarios are defined in terms of two groups of 'key uncertainties'. The first concerns *national institutions*: to what extent will the mix of public and private responsibilities change? The second key uncertainty concerns *international cooperation*: to what extent are national states willing and able to cooperate in Europe and at a world wide scale?

In the CPB-study *Four Futures of the Netherlands: Production, Labour and Sectoral Structure in Four Scenarios until 2040* (Huizinga and Smid, 2004), the European scenarios are elaborated for the Dutch economy. These scenarios differ with respect to demography (population growth, ageing), macro-economic development (productivity, labour market participation, inflation, interest rates, world trade), government policy (e.g. social security system) and specific sector trends.

In this paper, the development of the sectors government (public administration, defense and subsidised education) and health care (including pharmaceuticals) are discussed. Both sectors are of great economic importance in the Netherlands. In terms of value added they constitute

[1] The CPB Netherlands Bureau for Economic Policy Analysis was founded in 1945. Its first director was Jan Tinbergen, who received a Nobel price for his work on econometric modelling. Also the famous econometrician Henri Theil worked at the CPB. The first long-term study by the CPB (Verdoorn) was published in 1955.

about one fifth of the Dutch economy; in terms of employment and final consumption even about one quarter is involved. Furthermore, these sectors have in common that they are mainly financed publicly (by social security contributions and taxes) and that productivity growth is relatively slow. Baumol's cost disease model suggests that this can lead to increasing pressure on public finance and to negative effects for economic growth and inflation.

The European scenarios and the major results for the whole Dutch economy are summarised in section 2. The scenarios and results for the government sector are the topic of section 3, while the future of health care in the Netherlands is discussed in section 4. Boxes are used to discuss the most important concepts, trends and economic behaviour. Topics included are:

- Why does productivity growth of government services lag behind?
- Baumol's cost disease model ;
- The major determinants of expenditure on health care;
- Ageing and health care.

2 The scenarios

2.1 Two key uncertainties

The scenarios in the CPB-studies Four Futures of Europe and Four Futures of the Netherlands are based on two key uncertainties: international cooperation and national institutions, i.e. the mix of public and private responsibilities.

International cooperation

The benefits of further economic integration are still not exhausted. However, international cooperation, necessary for economic integration, will not be easy in the coming years. In some areas, such as global climate change, capital flight to tax havens, AIDS and poverty, cooperation is weak or even non-existent. In relatively successful areas, organisations such as the WTO and the European Union are nowadays under pressure. In particular, these organisations face three problems: increasing heterogeneity, increasing scope (from single-issue clubs to multi-issue negotiations and agreements) and lacking legitimacy. The first key uncertainty in the scenarios is therefore to what extent international organisations succeed in overcoming these problems during the coming decades.

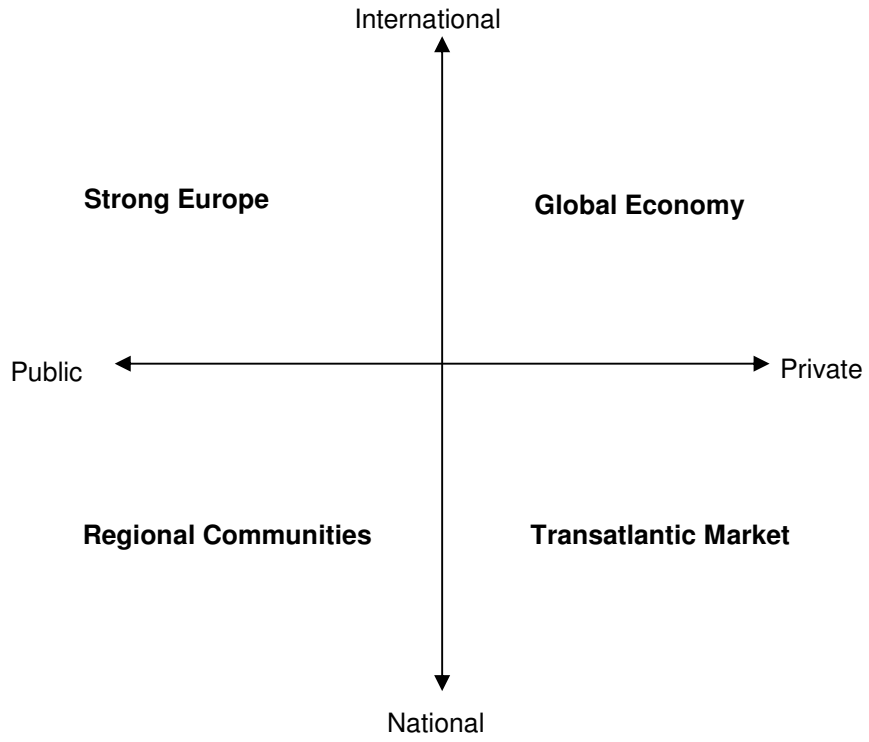
National institutions

In the late nineties, the US economy combined fast productivity growth with low unemployment rates. The contrast with Europe was strong. Europe's Lisbon agenda seeks to change this. The aim is to increase productivity growth, while maintaining social cohesion. This will not be easy. Many policy instruments give rise to a trade-off: increasing efficiency is often bought with less equity. The coming decades, all European countries will have to deal with ageing, individualisation and a probably increasing differences between the income of high- and low-skilled workers. These trends will put the public sector under growing pressure. The key uncertainty is therefore what level of public provisions will be chosen by the European countries. What will be the public responsibilities and what will be left to private initiatives?

Figure 2.1 combines the two key uncertainties and shows the four scenarios. The vertical axis ranges from successful international cooperation at the top, to an emphasis on national sovereignty at the bottom. The horizontal axis ranges from a strong role for the public sector at the left, to private responsibility at the right. The combination of the two key uncertainties yields four scenarios for Europe and its countries. In *Regional Communities,* European countries stress their sovereignty and national identity, and reforms in the public sector are only marginal. In *Strong Europe,* the public sector, in particular the social security systems, will be reformed substantially. In *Transatlantic Market,* the public sector is also substantially

reorganised, but European countries are not prepared to give up their sovereignty. In *Global Economy,* international cooperation is combined with a drastic reform of the public sector.

Figure 2.1 Two key uncertainties and four scenarios



These four scenarios lead to large differences in economic growth. Highest growth rates are achieved by a combination of international cooperation and a large role for the market, i.e. by the scenario *Global Economy*.

However, economic growth is not the same as welfare. A large role for the market stimulates economic growth, but induces also differences in income between high- and low-skilled workers and between the employed and the unemployed. Furthermore, a large role for the market will imply less incentives (and more free-riding) to solve global environmental problems. Similarly, international cooperation serves economic growth and the environment, but will harm the sovereignty and national identity of specific countries.

Table 2.1 Welfare-oriented overview table

	Regional communities	Strong Europe	Transatlantic market	Global economy
Volume growth of GDP per capita (% per year)	0.7	1.2	1.7	2.1
Income inequality	+	0	-	-
Cross-border pollution	0	+	-	--
Sovereignty and identity	+	-	0	-

The two CPB-studies focus on the economic consequences of the scenarios. For a balanced, more welfare-oriented, assessment of the scenarios, other dimensions, like income inequality, pollution and sovereignty should also be taken into account (see table 2.1).
In section 2.2 the economic consequences of the European scenarios are described more in detail. The major results for the Netherlands are summarised in section 2.3.

2.2 Four scenarios for Europe

Regional Communities

In the scenario *Regional Communities,* European countries stress their sovereignty and national identity. As a consequence, the European Union cannot adequately cope with the Eastern enlargement and fails to reform her institutions. As an alternative, a core of rich European countries emerges. More generally, the world is fragmented into a number of trade blocks, and multilateral cooperation, e.g. with respect to global environmental issues, is modest.

European countries rely on public arrangements to maintain an equitable distribution of welfare and to control local environmental problems. At the same time, governments in this scenario are unsuccessful in modernising welfare-state arrangements. A strong lobby of vested interests blocks reforms in various areas. Together with an expanding public sector, this development puts a severe strain on European economies.

The high tariffs of taxes and social security contributions and the lack of incentives to reduce the number of social benefits generate a relatively low rate of labour participation and high unemployment rates. Lack of competition reduces the urgency for corporations to innovate. The fragmented and not very transparent markets limit the dissemination of knowledge. Accompanied by relatively small differences in income creates only most incentives to invest in human capital. The annual labour productivity increase and economic growth are small.

Strong Europe

In *Strong Europe,* international cooperation is important. Reforming the process of EU decision-making lays the foundation for a successful strong European Union. The enlargement is a success and integration proceeds, both geographically, economically and politically. Europe is the driving force behind broad international cooperation -not only in the area of trade, but also in other areas such as climate change and poverty reduction. Europe and the USA agree on a joint, somewhat less ambitious, approach to tackle climate change. Turkey, a country with a relatively large, poor and low-skilled population, is accepted as a member of the European Union.

Like in *Regional Communities,* solidarity and equity are important for *Strong Europe*. Nevertheless, in response to the growing pressure on the public sector, selective reforms are undertaken in the labour market, social security and public production. Combined with higher

investments in education and research and a bigger joint market, labour productivity increases more than in *Regional Communities*. Also economic growth is higher.

Table 2.2 Major features of the scenarios

Public	**Solidarity and equity; large role for the government**
Regional Communities	Minor reforms of public arrangements
	Strong lobbies of interest groups
	Fragmented markets
Strong Europe	Some substantial reforms of public arrangements
	Clear vision on tasks of the government
	Reform of EU successful, Turkey enters European Union
Private/Market-oriented	**Preference for private initiatives and more limited role of government**
Transatlantic Market	Substantial reforms of public arrangements
	Absence of appropriate regulation and strong lobbies of interest groups
	Reform of EU fails, instead transatlantic economic integration
Global Economy	Drastic reforms of public arrangements
	Appropriate regulation
	Reform of EU and WTO successful, Turkey enters European Union

Transatlantic Market

In the scenario *Transatlantic Market,* countries are reluctant to give up their sovereignty. Turkey does not enter the European Union. Reforms of EU decision making fail. Instead, the European Union redirects her attention to the United States: they agree upon transatlantic economic integration. This yields welfare gains on both sides of the Atlantic.

In this scenario, European countries limit the role of the state and social security and rely more on market exchange. The labour market become more flexible and differences in income increase.

Cutting back social security increases labour participation. International competition stimulates innovation. The increasing differences in income make education more attractive. Labour productivity increases and economic growth is high. Cross-border environmental issues are not tackled, but the higher material welfare does induce local investments in reducing noise and nasty smell and in public parks and gardens.

Global Economy

In the scenario *Global Economy,* the European Union enlarges eastwards with Turkey and the Ukraine. The WTO-negotiations are successful and international trade flourishes. However, political integration and international cooperation with respect to non-trade issues are not successful. Like in *Transatlantic Market*, the role of the state is limited and the role of private initiative and the market are stressed.

The growth of labour productivity is even higher than in *Transatlantic Market*. In this scenario, material welfare increases therefore most. Like in *Transatlantic Market,* no agreement

is reached for a joint approach to climate change. In combination with the high economic growth pollution at a global level is relatively high. However, investments in the local environment are stimulated by the high level of material welfare.

2.3 Major results for the Netherlands

The differences in international cooperation and reforms of the public sector, like those with respect to social security, drastically influence the economic outcomes. The driving forces behind economic growth are the development of employment and labour productivity. Employment and labour supply are affected by demographic developments, immigration and labour market participation. Table 2.2 provides an overview of the major macro-economic results for the Netherlands.

Table 2.3 Major results for the Netherlands

		Regional Communities	Strong Europe	Transatlantic Market	Global Economy
	1971-2001	2002-2040	2002-2040	2002-2040	2002-2040
	changes per year in %				
Population	0.7	0.0	0.4	0.2	0.5
Labour supply	1.1	– 0.4	0.1	0.0	0.4
Employment	0.9	– 0.5	0.1	0.0	0.4
Labour productivity	1.9	1.2	1.5	1.9	2.1
Volume of GDP	2.6	0.7	1.6	1.9	2.6
Volume of GDP per capita	1.9	0.7	1.2	1.7	2.1
Unemployment (% labour force)	5.5	7.3	5.7	4.6	4.1
Public expenditure (% GDP)	42.1	51.1	47.0	38.0	36.1

The scenarios imply for the Dutch economy a wide range of results for many variables. For instance, the cumulated growth of GDP per capita until 2040 varies from 30% to 120%. In the more market oriented scenarios (*Transatlantic Market* and *Global Economy*), economic growth is higher, but they are also characterised by more inequality and less concern for the environment.

Ageing has a negative effect on labour supply and employment growth and on the ratio of the active to the non-active population in all scenarios. An increase in participation, especially of women and older workers, may counterbalance these effects. Employment shares of sectors will shift strongly, particularly from agriculture and manufacturing to services and health care. This shift is a continuation of a process that has already been going on for decades.

3 Government

3.1 Introduction

In 2001, the value added of the government sector amounted to 10.5% of GDP and final consumption of government services to 13.6% GDP; employment in full-time equivalents was 11.5% of the Dutch economy.

The government sector refers to all activities of the government, such as defence (1% of GDP in 2001), education (4% of GDP) and public administration (6% of GDP)[2]. Public administration comprises a wide variety of activities. Policy preparation and organising the democratic decision-making process is only a minor part of the activities. The major activities are the provision of specific services, like police, justice, construction and maintenance of roads, the collection of taxes and social security contributions and the distribution of social benefits and subsidies.

The next forty years, the growth of labour productivity at the government will probably, like in the past, lag behind the general productivity growth (see box Why does productivity growth of government services lag behind?, p. 22). In the high general productivity scenarios *Transatlantic Market* and *Global Economy*, also the productivity of the government sector will be higher. This reflects a more rapid technological development (e.g. more intensive use of ICT) and a larger emphasis on efficiency and standardisation. The productivity growth will be concentrated in the more administrative parts of the government. For education, police and justice, productivity growth will be more difficult to realise, even though developments like e-government could contribute to productivity growth and a better quality of the services.

In order to compete at the labour market, in the long run, government wages should be in line with the wages in the other parts of the national economy. Combined with a lagging productivity growth this will cause an increase in the relative price of government services. This could lead to Baumol's disease, i.e. an increasing share of national income spend on government services, lower economic growth, higher inflation and a higher public tax burden (see box Baumol's disease and the government, p. 23).

The demand for government services is determined by not only the relative price of government services but also by many other factors, like demography, economic growth, budgetary situation, visions on the tasks of the government and the interests of specific groups. The demand for government services differs therefore substantially in the four scenarios.

[2] Excluded are the activities of the government pertaining to industries not characteristic for government. Examples are garbage disposal, manufacturing workshops for the disabled, preventive health-care by local authorities and asylum seekers' centres. In 2001, their value added amounted to 2.1% GDP. Value added of the institutional sector government amounted thus to 12.6% GDP in 2001. Final consumption of the corresponding services was 16.1% GDP.

Why does productivity growth of government services lag behind?

Productivity growth of government services is difficult to measure. In the Dutch national accounts a productivity growth of almost 1% per year has been assumed for the last twenty years[a]. This is substantially less than the 2% productivity growth by the market sector. This confirms Baumol's law: productivity increases are relatively difficult to achieve for services, in particular for so-called stagnant personal services.

Stagnant personal services are defined by Baumol (1985, p. 302) as "activities in which quality is highly correlated with labour-time expended, and in which frequently … there must be direct contact between the consumers and those who provide the labour. These services are also often characterised by the inherent difficulty of standardisation of their product". Services by the government like education, police and justice could be regarded as stagnant personal services. Economies of scale are often difficult too realise, e.g. increases in class size impede quality of education. Also some health-care services, e.g. nursing, could be regarded as stagnant personal services.

Productivity increase of stagnant personal services is difficult to achieve. However, stagnant personal services are not immune to progress. Productivity increase can be possible by a partial substitution with goods or less labour intensive services, like cameras, educational software and divorce via internet. Another source for productivity increase can be found in improving the productivity of supporting activities, like the administrative processes of police, justice and education.

Not all government services should be regarded as stagnant personal services. Activities like the collection of taxes and the granting of social benefits do not require such direct and personal contact with the consumer. For such services, standardisation, increases in scale and ICT do lead to substantial economies of scale and can also raise quality.

These general insights can be compared with estimates of productivity growth of Dutch government services (see Kuhry and van der Torre, 2002, page 267). According to these estimates, productivity in primary education, judges and police declined in the period 1990-1999. This contrasts with productivity increases of 2% or more per year in the administration of taxes and social security and higher education. Despite potential measurement problems (e.g. with respect to quality), these substantial differences between personal and impersonal services seem to confirm Baumol's law; only the productivity increase of higher education does not comply with Baumol's law. For services like defence and policy preparation, no estimates of productivity growth are available. In particular for such public services defining and measuring output and productivity is difficult.

In a well-known Swedish report (see Swedish Ministry of Finance, 1996, p. 19), also a link between productivity and budgetary restraint is suggested. In Sweden, productivity increased in education, health care and justice in 1980-1983 and 1990-1992. In these periods, greater budgetary restraint and increased external demands on performance (more patients, more school children, more court cases, etc.) have probably forced a greater utilisation of capacity and increased awareness of costs.

[a] In the Dutch national accounts, productivity growth of the government is assumed to be equal to the three years moving average of the incidental wage increase (see Kazemier, 1991). Since the Dutch national accounts 2001, for education a different definition has been employed. In line with the most recent European guidelines on measuring volumes in the national accounts (see Eurostat, 2001, pp. 142-144), productivity is defined as -broadly- the weighted development of the pupil-teacher ratio.

Baumol's disease and the government

Slow productivity growth of services, like that for government and health-care services, can lead to Baumol's disease (see Baumol, 1967). Relatively slow productivity growth and wages following the general wage development make services per unit product relatively expensive. In combination with the assumption of a relatively price-inelastic demand this results in an increasing share of (government) services and an even faster rising share in national employment. This generates Baumol's disease, i.e. a lower economic growth rate for the national economy and a higher inflation rate due to the increasing relative price of services.

Consumption of government services is mainly financed by taxes. A growing share of government services in GDP increases public expenditure and can therefore induce higher government debt and higher tax rates. The latter reduces by definition the net return on labour and capital and therefore the supply of labour and capital. This is a second way in which slow productivity growth of government services can generate stagnant economic growth.

In the long run, ever increasing government debts and tax rates are not sustainable. They can then necessitate substantial cuts on public expenditures and mitigate in this way the demand for government services. The same can apply to the European norms for the government deficit and debt and for general policies to reduce the tax burden.

Since the fifties up to the beginning of the eighties, the share of government services in Dutch GDP has increased rapidly and in line with the prophesy of Baumol's disease. However, during the last twenty years, the share has declined with 3% of GDP. Baumol's disease disappeared in the Netherlands, because the relative price increase of government services was mitigated by a very modest development of government wages (in particular in the beginning of the eighties) and a relatively slow growth of the volume of government services. The latter was mainly due to the halving of defence expenditure as a percentage of GDP (the so-called peace dividend) and by the slow growth of expenditure on education (mainly for demographic reasons). This relatively slow growth of government services causes as such a decrease in the employment share. However, this was compensated by the lagging productivity growth of the government. As a consequence, government's share in employment remained unchanged during the last twenty years.

3.2 Four scenarios for government services

The major results for the sector government are shown in tables 3.1, 3.2 and 3.3.

In 2001, value added of the government sector amounted to 10.5% of GDP. In the two more public scenarios (*Regional Communities* and *Strong Europe*), this will increase to about 12% in 2040 (respectively 12.7% GDP and 11.4% GDP). In the more market oriented scenarios (*Transatlantic Market* and *Global Economy*), the share of the government will shrink towards about 8% of GDP (respectively 8.3% GDP and 8.1%).

A similar development takes place in terms of shares in national employment: in the public scenarios, the share of employment in the government sector increase, while it will decrease in both market scenarios.

Table 3.1 Key-figures on the government sector (public administration, defence and subsidised education)

	1980-2001	Regional communities 2002-2040	Strong Europe 2002-2040	Transatlantic market 2002-2040	Global economy 2002-2040
	annual change %				
Volumes					
Volume of government services per capita	0.9	0.8	1.1	0.7	1.0
Volume of GDP per capita	1.9	0.7	1.2	1.7	2.0
Population	0.6	0.0	0.4	0.2	0.5
Prices					
Price of government services	1.3	1.9	2.0	1.5	1.9
Price of GDP	2.2	1.5	1.6	1.2	1.5
Labour productivity					
Government	1.2	0.6	1.0	1.2	1.5
National economy	1.3	1.2	1.5	1.9	2.1
Employment					
Government (full-time equivalents)	0.3	0.2	0.4	– 0.2	0.0
Value added government % GDP	10.5	12.7	11.4	8.3	8.1
Consumption government services % GDP	13.6	16.4	14.8	10.8	10.5
Employment government % total	11.5	15.0	13.3	10.6	9.9

Table 3.2 Employment in the government sector

	1980-2001	Regional communities 2002-2040	Strong Europe 2002-2040	Transatlantic market 2002-2040	Global economy 2002-2040
	level at the end of the period				
Government as % of national total	11.5	15	13.3	10.6	9.9
public administration	5.7	8.4	6.4	4.8	4.1
defence	1.0	1.2	1.3	1.0	0.9
subsidised education	4.8	5.3	5.6	4.8	4.9
	level at the end of the period				
Government, thousands f.t.e.-employment	752	812	885	685	761
public administration	372	456	424	310	319
defence	67	67	87	67	67
subsidised education	312	289	374	307	375
	annual change %				
Government, full-time-equivalent employment	0.3	0.2	0.4	– 0.2	0.0
public administration	0.0	0.5	0.3	– 0.5	– 0.4
defence	– 1.8	0.0	0.7	0.0	0.0
subsidised education	0.5	– 0.2	0.5	0.0	0.5

The development of the relative size in terms of GDP of employment does not provide information about the development of volume of government services per capita. In the two market scenarios, GDP per capita increases much more (95% and 121% in forty years) than in both public scenarios (33% and 56%). This higher growth rate of GDP per capita compensates to a great extent the lower preferences for government services. In the public scenario *Strong Europe*, growth of the volume of government services per capita is highest with 1.1% per year; in forty years this amounts to a cumulated increase of 50% (see table 3.2). However, this growth is only marginally higher than the 45% (1.0% per year) in the market scenario *Global Economy*. In the public scenario *Regional Communities*, growth per capita is smaller (37% in forty years, 0.8% per year) and almost equal to the 35% cumulated growth in the market scenario *Transatlantic Market* (0.7% per year).

Table 3.3 Volume growth of government services per capita (value added)

			Regional communities	Strong Europe	Transatlantic market	Global economy
	1980	2001	2040	2040	2040	2040
	index 2001= 100					
Government services per capita	83	100	137	150	135	145
GDP per capita	67	100	134	156	195	221

Regional Communities

The scenario *Regional Communities* is characterised by a government strongly influenced by lobbies of interest groups and considerations of solidarity and equity. There is no clear view on what the government should or should not do. Efficiency is not a major issue in government policy. In such a scenario, the government will engage in new tasks and will expand existing tasks. Temporary projects will turn out to be permanent. No effective counterbalancing forces exist due to the absence of to a balanced appraisal of the various interests and a limited focus on efficiency.

Employment in public administration will therefore increase. e.g. through more employment for security (police, justice, checking of compliance with regulations by municipalities and provinces) and various employment projects. Due to demographic developments, the number of pupils will decrease in forty years with about 15%. Employment in subsidised education will decrease somewhat less rapidly because of extra efforts for special needs pupils. For defence, an unchanged number of employees is assumed. The volume of defence services will therefore increase with the labour productivity growth.

In this scenario, value added of the government will increase with more than 2% of GDP, from 10.5% in 2001to 12.7% GDP in 2040. Due to lagging labour productivity growth, increase in terms of employment is even from 11.5% in 2001 to 15.0% in 2040, i.e. 3.5% point. In *Regional Communities,* increase in the employment share of the government is therefore higher

than all other scenarios (see figure 3.1). Growth of GDP per capita is limited to 0.7% per year; the volume growth of government services per capita is slightly higher (0.8% per year).

Strong Europe

In comparison with *Regional Communities, Strong Europe*'s increase in value added and employment is about half as big (1% GDP and about 2%-point of employment share). However, the volume growth of GDP and government services per capita is much higher (respectively 0.5% and 0.3% per year).

Like in *Regional Communities,* solidarity and equity are important in *Strong Europe*. However, in this scenario a clear view on the tasks of the government exists. As a consequence, no unguided and unbalanced growth of public administration will occur. From an international and European perspective, one is well aware of the necessity to increase labour participation and productivity. As a consequence, more investments are made in education and research. The higher flow of immigration causes a higher population growth and therefore extra expenditure on education. The number of pupils and students increases with more than 10%. Reforms towards more tailor-made education further stimulates the employment in subsidised education. At present, the defence-expenditure of some big countries (France and the United Kingdom) are disproportionally high in Europe. In this scenario, a more proportional system of contributions to European defence implies for the Netherlands an increase of defence expenditure and employment .

Transatlantic Market

In *Transatlantic Market,* the relative size of the government sector decreases with 2,1% of GDP to 8% of GDP. The government share in employment shrinks with 0,9% point to 10,6% in 2040. The volume growth of government services per capita is 0,7% per year. This is slightly smaller in the scenario *Regional Communities*, but substantially smaller than the volume growth of GDP per capita in *Transatlantic Market* (1,7% per year).

In this scenario, much more is left to private initiative. The welfare state has been cut down and this causes substantial savings on the administration of the welfare state. School fees are increased and scholarships by the government are reduced. The higher costs of education for students is counterbalanced by larger differences in wages between high- an low-skilled workers and by lower taxes. Furthermore, higher income per capita GDP makes increases in school fees a smaller financial burden. Mainly for demographic reasons, the number of pupils and students decreases somewhat.

The importance of efficiency and productivity growth is acknowledged in *Transatlantic Market*. In order to give more leeway to private initiative, government services are reduced. There will be no European defence policy and the defence expenditure remains unchanged in terms of employment and percentage of GDP.

Global economy

In *Global Economy,* the government sector decreases to somewhat more than 8% of GDP. Employment by the government decreases to less than 10% of national employment. GDP per capita increases with 2% per year. The volume growth of government services per capita is substantially smaller; nevertheless, the 1% growth per year is substantially higher than volume growth of government services in *Regional Communities* and *Transatlantic Market*.

Like in *Transatlantic Market,* more is left to the market and private initiatives. However, the focus on increasing private initiative and reducing the role of the government is much stronger than in *Transatlantic Market*. School fees are substantially increased and scholarships are minimised. These negative incentives for human capital formation are counterbalanced by higher economic growth per capita and bigger differences in wages. Mainly for demographic reasons, the number of pupils and students increases with 20%. More tailor-made education will further stimulate employment in education. The government retreats to its core-tasks. Private education will become responsible for a substantial part of higher education, in particular by expensive and specialised academies.

The welfare state has been cut down substantially. Laws and regulations will be simplified and special cases are more often ignored. Savings on administrative services are therefore more substantial than in *Transatlantic Market*.

There will be no European defence policy and the defence expenditure remain unchanged in terms of employment and percentage of GDP.

4 Health care

4.1 Introduction

In 2001, the value added of the sector Health care (Health and social work activities) in the national accounts was 7.0% of GDP. Expenditure on health care (or final consumption) amounted to 8.7% of GDP.

The sector Health care covers nearly all types of care financed by social-security contributions (Medical Health Fund Act (ZFW) and the Exceptional Medical Health Act), taxes (e.g. municipal preventive health care and welfare work), private health-care insurance and paid directly by households. However, excluded are pharmaceuticals (1.3% of GDP) and the administrative costs of running private and public health-care insurance (0,3% GDP). Including also these types of expenditure would imply a figure of 10,3% of GDP[3]. Most of these expenditures on health care are financed via social security contributions (6,5% of GDP in 2001).

Basic assumptions in the four scenarios

Expenditure on health care in the Netherlands increased rapidly in the fifties, sixties and seventies of last century. However, during the period 1980-2000 expenditure on health care remained rather constant as a percentage of GDP (9% of GDP). A major reason for this was restrictive budgetary policy (see Spaendonck and Douven, 2001). Since 2000, expenditure on health care has again grown rapidly; in 2003, they already amounted to 11% of GDP. Also this rapid growth is influenced by government policy, i.e. policy to reduce waiting lists.

In the long run, expenditure on health care will grow more rapidly than GDP. This applies not only to the Netherlands but also to many other countries. Various factors can explain the increasing share of expenditure on health care in GDP. According to Baumol's law (see also the explanation in the boxes on pages 22 and 23) labour productivity growth in health care will be smaller than in the rest of the economy, while wage-rates will grow in line with those in the rest of the economy. The box on page 31 provides an overview of such major determinants of expenditure on health care in the long run.[4]

The relative importance of these determinants is different in the four scenarios, e.g. with respect to population growth. Demography, and in particular ageing, will become more

[3] This concept of health-care seems in some respects rather broad, e.g. by including also asylum seekers centres and child care institutions. The concept of health-care used in Dutch politics excludes these expenditure. The policy concept also excludes some supplementary and luxury health-care. However, our broad concept of health-care still excludes some care, e.g. domestic services purchased directly by households like cleaning and babysitting, public expenditure on provisions for the handicapped (WVG) and also all types of informal care by family and friends.

[4] Hall and Jones (2004) also make a link between the increase in expenditure on health-care and the increase in life expectancy. In the USA, life expectancy grew from 68 years in 1950 to about 77 years in 2002; expenditure on health-care increased from 5% of GDP to 15% in 2000. Diminishing marginal utility of non-health consumption combined with a rising value of life causes the health share to grow as long as income grows. By the middle of the century, health share in the USA is therefore expected to be 33% of GDP.

important in the next forty years than in the past forty years. In all scenarios, ageing will contribute substantially to the growth of expenditure on health care (see Box Ageing and expenditure on health care on page 30). A basic assumption in constructing the health-care scenarios is the empirical finding that the growth of expenditure on health care is closely related to economic growth (Gerdtham and Jonsson, 2000)[5]. The influence of advances in medical technology on expenditure on health care differs between the various scenarios. The adoption of new medical technology depends also on budgetary restraints and is therefore also closely related to economic growth.

In all scenarios, government policy differs. In both market oriented scenarios, the role of the government is reduced. For example, in *Global Economy*, markets function well and therefore we expected that the revisions of the Dutch health-care system, like that in 2006[6], will generate a more efficient provision and higher quality of care. This scenario is not focused on solidarity and equity, so a major part of the growth of expenditure on health care will pertain to private health care (e.g. the health care supplementing the new standard package of basic provisions). In *Transatlantic Market,* also the role of public provisions is reduced. This increases expenditure on health care, as the elderly are willing to pay more for health care, in particular for private health care. However, the relatively poor will receive less health care. In *Transatlantic Market*, this is reflected by the different growth rates of publicly financed health care (2.0% per year) and private health care (2.7% per year).

Other international and national forecasts for health care

Nearly all international studies indicate that expenditure on health care will grow more rapidly than GDP. Wanless (2002) provides three scenarios for the development of expenditure on health care in the UK for the period 2002-2020. According to these estimates, expenditure on health care in the UK will increase from 7.7% of GDP in 2002 to somewhere between 10.6% and 12.5% of GDP in 2020. An increase of expenditure on health care in the USA is also expected. In estimates by Heffler et al. (2004) expenditure on health care increase from 14.1% in 2002 to 18.4% of GDP in 2013.

[5] In the literature on expenditure on health-care, there is discussion about the size of the income elasticity. Some argue that health-care is a luxury good which implies an income elasticity above one. Others argue that the income elasticity is lower than one and that technology and social cultural trends are major exogenous driving factors behind health-care growth. In constructing the health-care scenarios of this study, first the volume of health-care is adjusted for ageing and general population growth. Additional growth to accommodate technological developments and social cultural trends depends on the economic situation.

[6] At present, for low income earners (excluding civil servants and self-employed) normal expenditure on health-care are covered by the Medical Health Fund Act (a social security scheme). All other people should cover their own expenses on health-care, e.g. via private insurance or via contributions by the employer. The major change of the new system is that there will be a standard package of normal health-care obligatory for all people. This will be part of the social security system. For low income earners a separate grant is provided to compensate them for their loss of income. All care not covered by the standard package can be insured privately.

The major determinants of expenditure on health care

Ageing

An ageing population will increase expenditure on health care. The elderly will not only spend more on health care, but will also need different type of health care. This will also change the composition of health care (see Box 4.2).

Medical technology

Advances in medical technology are regarded as one of the major stimuli for the growth of expenditure on health care (see Newhouse, 1992 and Cutler, 1996). Jones (2002) estimates that at least half, but probably even three-quarter, of the increase of the share of health care is the consequence of the 'march of science'. Similar estimates exist for the Netherlands. Spaendonck and Douven (2001) estimate that about half of the growth of health-care services in the period 1960-1997 is due to technological developments (and social-cultural trends). Advances in medical technology are likely to continue, e.g. with respect to gene therapy, genetic testing and screening, video technology, vaccines, artificial blood, transplants and preventive medicine (RIVM, 2002).

Income and socio-cultural trends

As a consequence of increasing income, patients and consumers will want more quality and more choice. This can generate a continuous pressure to improve the quality of health care and to extent the range of health-care products. Also factors like an increasing average level of education, changes in the composition of households and individualisation could influence the size and composition of expenditure on health care, e.g. by reducing the supply of informal care.

Government policy

Government policy also affects expenditure on health care, in particular the publicly financed part. In 2006 Dutch government intends to introduce basic health insurance and wants to increase competition between insurers and between the providers of health care. The Dutch government also wants to make municipalities responsible for some local care, e.g. welfare services and domestic services. In the four scenarios, such changes in government policy have been included only in a very general way.

Labour productivity growth and relative prices

Labour productivity growth in health care can be achieved in many ways. Examples are improving the coordination of various types of care, less bureaucracy and overhead, better use of information technology and substitution of high skilled labour by less skilled (e.g. for elementary dental services). Nevertheless, labour productivity growth in health care is likely to be smaller than in the rest of the economy, in particular for physically very labour intensive care, e.g. nursing.

According to the Dutch national accounts, during the last twenty years labour productivity in health care decreased with 0.3% per year. However, the measurement method does not comply with the most recent European guidelines on volume measurement in the national accounts (Eurostat 2001). As a consequence, quality improvement and therefore productivity growth may have been underestimated. Alternative and much more detailed estimates are available from the SCP (Kuhry and van der Torre, 2002). They made rough estimates of productivity growth for seventeen different types of health care. Average labour productivity growth for total health care was 0.7% per year during the period 1990-1999. Productivity growth was highest in maternity care (3.5% per year). Productivity growth for hospitals was 1% per year. Labour productivity declined in some sectors, in particular in nursing homes.

In order to compete on the labour market, wage-rates in health care should, in the long run, be in line with that in other sectors. Due to a relatively low productivity growth, the relative price of health care will increase. In the period 1990-1999 the price increase in health care was about 0.7% per year higher than the price increase of GDP (Folmer et al. 2001).

For the Netherlands, a previous CPB-study on ageing (van Ewijk et al., 2000) estimated an increase of public expenditure on health care from 7% of GDP in 2001 to 11,9% GDP in 2040. Other more recent long run estimates about Dutch health care cover only parts of health care.

Ageing and health-care services

In the four scenarios, ageing will increase the expenditure on the health-care services with about 0.8% per year. This volume-effect is calculated on the basis of cost-profiles by age and gender in 1999 (Polder et al., 2002). These cost-profiles indicate that expenditure on health care increase with age and even exponentially after 65 years. The volume-effect of 0.8% reflects the impact of a changing demographic composition while assuming a fixed and unchanged consumption of health care by age and gender. However, it is likely that the cost-profiles will change over time, e.g. due to changes in health, income, technology, household composition and institutions.

The impact of ageing on health care is not a recent phenomenon. In the period 1961-2001, the volume effect was about 0.6% per year. During 1961-1980, the share of the young was relatively high. This substantial group becomes older and generates therefore higher expenditure on health care. The maximum effect is attained in the period 2020-2040: about 1% per year. After 2040, ageing will decrease and therefore also the impulse of ageing on expenditure on health care.

In all scenarios, ageing will drastically influence the composition of health care, in particular care for the elderly will become much more important. The fixed cost profiles of 1999 are likely to be misleading in some respects. They predict a rapid growth for nursing homes for the elderly. However, such services will probably more and more provided extramural. People will stay at home much longer, get adjustments in their housing conditions and receive domestic services and personal care at home.

The net effect of ageing on the annual growth of expenditure on health-care services

		Regional communities	Strong Europe	Transatlantic market	Global economy
		annual change %			
1961-2000		0.6	0.6	0.6	0.6
2001-2020		0.8	0.7	0.8	0.7
2021-2040		1.0	1.0	1.0	0.9
	1980-2001	2002-2040	2002-2040	2002-2040	2002-2040
Total	0.6	0.9	0.8	0.9	0.8
general hospitals	0.5	0.6	0.5	0.6	0.5
family doctor	0.3	0.4	0.4	0.4	0.3
dentist	0.0	– 0.2	– 0.2	– 0.2	– 0.2
service homes	1.9	2.0	2.2	2.3	2.1
nursing homes	1.5	1.8	1.9	1.9	1.8

SCP (Timmermans and Woittiez, 2004) estimated that the total potential demand (in number of persons) for nursing will increase with nearly 40% in the period 2002-2020. However, for two reasons, publicly financed nursing (via the Exceptional Medical Health Act) will increase only with 28%. Firstly, chronic diseases do increase potential demand for nursing and private nursing (even if the disease did not yet lead to serious practical difficulties), but do not increase

publicly financed nursing. Secondly, a higher socio-economic position increases potential demand, but lowers the use of publicly financed nursing. This is caused by the increase of private contributions to public nursing. According to the SCP, in the future the potential demand for nursing will be more and more met in an informal and private way and by adjusting the housing and living conditions.

4.2 Four scenarios for health care

Expenditure on health-care services as a percentage of GDP will increase in all scenarios from 8.7% in 2001 to between 13.3% and 14.6% in 2040. Both market scenarios (*Transatlantic Market* and *Global Economy*), have higher growth rates (respectively 1.9% and 2.4% per year) than both public scenarios (*Regional Communities* and *Strong Europe*, with growth rates of 1.2% and 1.6% per year).

Table 4.1 Key-figures on the sector health care (/health-care services)

		Regional communities	Strong Europe	Transatlantic market	Global economy
	1980-2001	2002-2040	2002-2040	2002-2040	2002-2040
		changes per year (%)			
Volumes per capita					
GDP	1.9	0.7	1.2	1.7	2.1
Value added health care	1.2	1.2	1.6	1.9	2.4
private consumption		0.9	1.5	2.5	2.7
government consumption		1.3	1.7	1.8	2.4
Population		0.0	0.4	0.2	0.5
Prices					
Price GDP		1.5	1.6	1.1	1.4
Price consumption health care		2.1	2.3	2.2	2.5
Labour productivity					
National economy	1.3	1.2	1.5	1.9	2.1
Health care	– 0.3	0.5	0.6	0.7	1.0
Employment					
National economy	1.1	– 0.5	0.1	0.0	0.4
Health care	2.1	0.6	1.3	1.3	1.8
		levels at the end of the period			
Final consumption health care (% GDP)	8.7	13.4	13.3	14.3	14.6
Employment (% of national total)	10.8	16.4	17.7	18.3	18.5

Employment in the sector health care

In all scenarios, the share of employment in health care services increases from 10.8% in 2001 to somewhere between 16.4% (*Regional Communities*) and 18,5% (*Global Economy*). The young will be stimulated to follow education in health care and to work in health care. Employees, in particular women, will be stimulated to continue working in health care as long as possible. In the market oriented scenarios (*Transatlantic Market* and *Global Economy*), the leading role in ensuring sufficient labour supply is played by the producers and insurers of health care. In the public scenarios (*Regional Communities* and *Strong Europe*), also the government interferes, e.g. with subsidies and programmes for retraining.

In *Global Economy,* the labour market is tight and the share of health-care employment is highest. In this scenario, employees will be recruited from abroad, in particular for nursing and the care for the elderly. In *Transatlantic Market*, working in private health care is attractive, because the relative price of labour is higher. This generates also a difference in the labour supply for health care. High quality and more expensive hospitals will attract the best medical experts and will focus on providing private health care. Public health care will be provided by relatively less skilled and talented personnel.

Expenditure on health care including pharmaceuticals and administrative costs

The four scenarios in table 4.1 focus on the services of the sector health care. Using a more encompassing concept of health, i.e. including pharmaceuticals and administrative costs, gives a somewhat different picture. The major reason is that for pharmaceuticals a high increase in volume as well as a relatively high price increase can be expected. For example, in the period 1990-1999 volume growth of pharmaceuticals was about 50% higher than the volume growth of health-care services (see Folmer et al., 2001).

Technological development may lead to improvements in current pharmaceuticals (e.g. less side-effects, more effective treatment), but also to entirely new pharmaceuticals. For example, pharmaceuticals for diseases for which no effective pharmaceuticals existed or supplementary pharmaceuticals that improve the quality of life. In order to cover the costs of research and development, marketing and investment risks, new and better pharmaceuticals are relatively expensive.

The price elasticity of pharmaceuticals is generally very low. The market mechanism therefore does not restrain price increases. Government policy may be effective to limit part of these price increases.

Elderly people consume much more pharmaceuticals than young people. Ageing increases therefore also the consumption of pharmaceuticals.

The results for the more encompassing concept of health can be deduced by making an explicit assumption about the pharmaceuticals. Assume that in all scenarios the consumption of pharmaceuticals increases 25% more than that of the sector health care. This would imply that the expenditure on health care (including pharmaceuticals and administrative costs) increases from 10.3% in 2001 to somewhere between 16.8% (*Regional Communities*) and 18.7% of GDP (*Global Economy*).

In all four scenarios, also the share of employment increases drastically, from 10.8% in 2001 to between 16.4% (*Regional Communities*) and 18.5% (*Global Economy*) in 2040. This is the result of the increase in the share in GDP and the relatively low labour productivity growth in health care.

Regional Communities

In *Regional Communities,* the volume growth of health-care services is rather modest with 1.2% per year. This growth is sufficient to cover the substantial claim of ageing (0.9%) and to use, to a very limited extent, new and more expensive medical technology. However, hardly no resources are available for any other increases in health-care services. The budgetary restraint is substantial, because GDP per capita increases only with 0.7% per year.

In comparison with other scenarios, labour productivity growth in the national economy is low (1.2% per year). Labour productivity growth in health care is even much lower (0.5% per year). For nursing and personal care, which become much more important in an ageing society, productivity growth will likely be small. The price of health-care services (2.1%) will therefore increase more rapidly than the price of GDP (1.5%).

Expenditure on health care increases from 8.7% to 13.4% of GDP due to a relative price increase of 0.6% and a volume growth of 0.7%. In combination with a relatively slow productivity growth the share in national employment increases from 10.8% in 2001 to 16.4% in 2040.

Strong Europe

The volume growth of health-care services in *Strong Europe* is with 2.0% per year substantially higher than in *Regional Communities*. This is partly due to population growth (0.4% per year). However, the volume growth per capita of 1.6% per year is sufficient to cover the costs of ageing (0.8% per year), to use new medical technology and for some other increases in health-care consumption. In *Strong Europe,* the government ensures solidarity: there is a comprehensive standard package of health care, with more new medical technology than in *Regional Communities*; incentives for the consumers of health care are sufficient to ensure an efficient use of health-care services.

The volume growth of health-care services (2.0%) is slightly higher than that of GDP (1.6%). Labour productivity growth in health care is lower than the rest of the economy. As a consequence, the price of health-care services increases 0.7% per year more than the price of GDP. Expenditure on health-care services increase from 8.7% in 2001 to 13.3% of GDP in 2040; this is a lower share in GDP than in all other scenarios. Employment in health care increases from 10.8% of national employment in 2001 to 17.7% in 2040.

Transatlantic Market

Volume growth of health-care services is 2.1% per year in *Transatlantic Market* . In combination with a modest population growth (0.2% per year), this implies that the growth of health-care services per capita (1.9% per year) is substantially higher than in *Regional Communities* (1.2% per year) and *Strong Europe* (1.6% per year). This rapid growth is partly caused by the use of much new medical technology from the United States. The use of this new technology is not all financed out of public resources. Those who can afford it use the new technology, e.g. wealthy elderly will spend a lot of money on long-term care. For the less wealthy not all new technology is available. In this scenario, privately financed health care (2.7% per year) grows more rapidly than publicly financed health care (2.0% per year).

The volume growth of health-care services per capita (1.9% per year) is sufficient to cover the costs of ageing (0.9%), to adopt new technology and to increase in other ways the volume and quality of health care, e.g. in response to socio-economic trends.

Like in all other scenarios, productivity growth in health care lags behind that in the rest of the economy. This increases the relative price of health-care services. Volume growth of health-care services (2.1%) is also somewhat higher than GDP volume growth (1.9%). As a consequence, the expenditure on health-care services increase from 8.7% GDP in 2001 to 14.3% of GDP in 2040. The share in national employment increases from 10.8% in 2001 to 18.3% in 2040.

Global Economy

Volume growth of health-care services in *Global Economy* exceeds that in all other scenarios (2.9% per year). Despite considerable population growth (0.5% per year), also volume growth of health-care services per capita (2.4% per year) is considerably higher than in all other scenarios. This reflects not only the costs of ageing (0.8% per year), but also the use of new technology and improvements in the quality of health care. Due to the high economic growth, many resources are available to finance extra health care. Growth of private health-care consumption per capita (2.7% per year) is higher than that of public health-care consumption (2.4% per year). Markets function well: the substantial increase in the volume of health-care services contribute effectively to better health and a better quality of life.

Relative prices of health-care services increase, because of the relatively low productivity growth in health care. The expenditure on health-care services increase from 8.7% GDP in 2001 to 14.6% in 2040. Employment in health care increases from 10.8% in 2001 to 18.5% in 2040.

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