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COMPILING COMPLETE BALANCE SHEETS FOR THE NETHERLANDS

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Summary: This report presents the methods and results of compiling non-financial balance sheets for the Netherlands for the period 1996-2008. The balance sheets are constructed for the total economy as well as by industry. Included in the balance sheet are fixed assets, inventories, consumer durables, land and subsoil assets. Special attention is given to land. Both theoretical and practical issues concerning its valuation are discussed. In 2008, the total value of non-financial assets in the Netherlands was 3.5 trillion euros. More than half of this value consists of dwellings and land underlying dwellings.

Keywords: Non-financial assets, balance sheet, fixed assets, inventories, consumer durables, land, subsoil assets

INTRODUCTION

This report presents the non-financial balance sheets for the Netherlands for the period 1996-2008. For this purpose, estimates are made for fixed assets, inventories, subsoil assets, the most important types of land and consumer durables. The main purpose of these balance sheets is to serve as an input in the calculation of growth accounts and multi-factor productivity.[1] Furthermore, publication of non-financial balance sheets is a purpose on its own. The recent economic crisis has shown that not only economic flows are important, but that stocks are just as important. The decline in real estate prices in the United States has for example been a major contributor to the economic crisis.

In the Netherlands, only fixed assets and oil and gas reserves are currently included in the growth accounts. Changes in the use of inventories, land and other subsoil assets in the production process are therefore reflected in the multi-factor productivity change.[2] With the inclusion of these non-financial assets in the Dutch growth accounts, the quality of the estimates of multi-factor productivity change will increase. Producing more extensive non-financial balance sheets is therefore an important step in the process of improving the growth accounts.

This report is structured as follows. Chapter 2 deals with produced assets. It first provides a short overview of the methods used to estimate fixed assets. Next, measurement issues concerning inventories are explained. The last part of the chapter deals with consumer durables. Chapter 3 discusses the methods used to estimate land. In chapter 4, issues concerning the valuation of subsoil assets are presented. Chapter 5 presents the resulting balance sheets. Chapter 6 provides a summary and discusses issues that remain to be solved.

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1 Since consumer durables are no input in the production process, they are not used for this purpose.

2 The same goes for changes in non-cultivated biological resources, water resources and intangible non-produced assets. The former two are very small in the Netherlands and are therefore unimportant for growth accounting purposes. For the latter, it is not clear to what extent it should be included in growth accounts. The asymmetrical treatment of purchased goodwill and non-purchased goodwill may lead to distortions in the growth accounts.

PRODUCED ASSETS

According to the European System of Accounts (ESA 95), three different types of produced assets can be recognized: fixed assets, inventories and valuables. Consumer durables are only recognised as a memorandum item. Since consumer durables are clearly produced and since the method for estimating consumer durables is similar to the method for estimating fixed assets, this report groups consumer durables under the produced assets.

No estimates of valuables are presented in this report. The main reason for this is that no good data sources are available for estimating valuables. Some valuables, such as some famous paintings by Rembrandt or Van Gogh, can not be insured because it is impossible to estimate their value. Since many valuables are unique, their value can not be based on the value of other valuables. The only way to value these unique valuables is to observe a market transaction for each specific valuable. Since most valuables are seldom traded, this method for valuation is unfeasible. Therefore, no estimates of valuables are made for the time being.

Section 2.1 first provides a short overview of the method for estimating fixed assets. The measurement issues concerning inventories are explained in section 2.2. Section 2.3 deals with consumer durables.

Fixed assets

Apart from livestock for breeding, dairy and draught (AN.11141), the net value (net capital stock) of all assets is estimated with the Perpetual Inventory Method (PIM). Estimates of livestock are based on direct surveys of the number of animals, multiplied with the value of these animals on the market.

A detailed description of the method for estimating the net capital stock is given by Van den Bergen et al (2008). This report will only present a short overview. The net capital stock is calculated as net present values of the current and future capital services a capital good is expected to generate during its remaining service life. Future capital services are based on estimates of the (gross and) productive capital stock. For this purpose, the following data are required.

- Time series of gross fixed capital formation and prices by industry, asset type and institutional sector. Time series have been constructed for the period from 1953 onwards. For this purpose, a wide range of different sources has been used. For the year 1952, a starting capital stock has been derived from an inventory of the capital stock that was still in operation after the Second World War.
- Survival functions. These are required to estimate the gross capital stock. For the manufacturing industry, directly observed capital stock benchmarks have been combined with discard surveys to estimate survival functions. For other industries than the manufacturing industry, different sources have been used, for example car registers, company records and literature.
- Age efficiency profiles. For estimating the productive capital stock, age efficiency profiles are necessary. Due to lack of reliable data, age efficiency profiles from the Australian Bureau of Statistics and the US Bureau of Labour Statistics have been used as main sources.
- Discount rate. The real discount rate used to calculate the net present value of future capital services has been set at 4 percent.
- Time series of other changes in the volume of assets like purchases of second hand assets, reclassifications and bankruptcies. Although sales and purchases of second hand assets are part of

the gross fixed capital formation, for practical reasons they are registered as other changes in assets in the PIM framework.

With these data, balance sheets of fixed assets were constructed at the level of 57 industry branches, 20 asset types and 18 institutional (sub)sectors.

Inventories

The ESA 95 recognizes 4 different kinds of inventories: Materials and supplies, work in progress, finished goods and goods for resale. For work in progress except livestock raised for slaughter, an estimate is made based on statistics on investments. Like livestock for breeding, dairy and draught, the estimates for livestock raised for slaughter are based on direct surveys of the number of animals, multiplied with the value of these animals on the market.

For the other types of inventories, a detailed description of the methods used is given in Taminiau-Van Veen et al (2009). The current report provides an overview of the main issues. For materials and supplies, work in progress and finished goods, estimates are based on business surveys. In these business surveys, companies are asked for the balance sheet at the beginning of the year, the changes in inventories and the balance sheet at the end of the year.[3] These data are however not completely in accordance with the regulations of the ESA. The balance sheet at the beginning of the year is (often) recorded in prices of the previous year, whereas the balance sheet at the end of the year is recorded in prices of the current year. As a consequence, the value that is entered as changes in inventories is in reality the combination of both changes in inventories and revaluation. In order to estimate the changes in inventories, the revaluation has to be calculated. For accurate estimates, revaluation should be done at the level of commodities. Therefore, the balance sheets (by industry) have to be divided into commodities first.

Balance sheets by commodity

For the division of finished goods and goods for resale into commodities, turnover by commodity is used for most industries. It is assumed that the ratio of sales per product group also applies to inventories. For the manufacturing industry, except the petroleum industry, this data is derived from the Prodcom statistics. Prodcom statistics list the sales of companies by product groups (CPA) which are in turn linked to commodities. The Prodcom survey is only carried out for large firms. It is therefore assumed that small firms have the same division by commodity as large firms. For the petroleum industry, a direct survey of physical inventories by commodities is used. These data are combined with data on price changes in these commodities to estimate monetary balance sheets.

Inventories of materials and supplies in the manufacturing industry, including the petroleum industry, are allocated to commodities using the ratio by product group of intermediate purchases as derived from the business surveys.

In construction, inventories of finished products do not exist. All finished products are directly recorded as gross fixed capital formation. Unlike in the manufacturing industry, it is not plausible (or even possible) that goods for resale are the same goods as the finished products. It is assumed that goods for resale comprise the same commodities as the materials and supplies. In practice, this means that the division of goods for resale in construction is equal to the division of materials and supplies by commodity.

[3] For finished goods, from 2006 onwards only the changes in inventories remain part of the business surveys. The method used for finished goods for 2006 and 2007 is therefore slightly different than the method described in this report. The main difference is that the balance sheet at the beginning of the year is set equal to the balance sheet at the end of the previous year, instead of using the surveyed balance sheet at the beginning of the year.

Both are based on the distribution of use by commodity in the supply and use tables of the national accounts.

For trade, turnover by commodity is derived from the business statistics. In the business survey, turnover by product group is recorded. Because the classification of product groups is less detailed than the classification of commodities, fixed ratios have been used to arrive at the division of turnover by commodity.

In the remaining industries, materials and supplies, finished goods and goods for resale are small. For this reason, and since no data are available on a division by industry, no division by commodity is made. The inventories in these industries are revaluated with the consumer price index.

Table 1 summarises the different sources that are used to estimate inventories by commodity.

Table 1: Sources used for estimating inventories by commodity.

	Inventories of materials and supplies	Inventories of finished products	Inventories of goods intended for resale
Manufacturing industry	Net turnover by commodities from business surveys	Prodcom	Prodcom
Petroleum industry	Physical Inventories by commodity	Production of the SUT	Production of the SUT
Construction	Use from the SUT	-	Use from the SUT
Trade	-	-	Net turnover to commodities from business surveys
Other industries	Not divided	Not divided	Not divided

Statistical discrepancies

In theory, the balance sheet at the beginning of the year should be equal to the balance sheet at the end of the previous year. These balance sheets are however the result of different surveys. Therefore, statistical discrepancies appear between the two balance sheets. If the opening balance sheet is set equal to the closing balance sheet of the previous year, the statistical discrepancies arise between the opening balance sheet and the closing balance sheet. To solve this, drafts of the new ESA prescribe that these statistical discrepancies should be recorded in the other changes in volume account. This way, all balance sheets are consistent.

A disadvantage of this method is that combining statistical discrepancies and 'real' other changes in volume into one account may bring about misunderstanding of the data. For this reason, it has been decided to record statistical discrepancies as a separate item in the balance sheet between the opening balance sheets and the closing balance sheets of a year.

Division into institutional sectors

The division of inventories by industries into institutional sectors corresponds with the distribution of production and use of the industries by institutional sectors.

Consumer durables

A detailed description of the method used for estimating consumer durables is given in Taminiau-van Veen (2010). In this report only a short overview is given. Evidently, consumer durables are owned by households and are presented on the balance sheet of the institutional sector households accordingly. The net value of consumer durables is estimated for 7 different types of consumer durables. The estimation method is identical to the method for estimating fixed assets. The PIM is used to estimate the net value of the consumer durables. Time series for the consumption of consumer durables are used as input in the PIM. As for investments, these time series is from 1953 onwards.[4] They are taken directly from the national accounts. The starting capital stock for 1952 is based on the consumption in 1953 and the estimated service lives for the consumer durables.

For the service lives of consumer durables, various data sources have been used. They include estimates from consumers' organisations, claims by producers, service lives from the US Bureau of Economic Analysis and literature. Trade in second hand assets is not taken into account, since most of it takes place between consumers. Two exceptions are made. The first exception is the consumption of second hand lease cars. This is the reciprocal of the sales of second hand lease cars by the industry renting of movables. The second exception is made for trade margins (and value added tax) on the purchase of second hand cars. By treating these margins as trade in second hand assets, these margins receive the same age-price profile as the elder cars on which they are levied.

LAND

Unlike the estimation of fixed assets and inventories, the estimation of land can not be presented without a discussion of several theoretical issues related to land. Determining what the market value of land should be is not straightforward, since often land can not be physically separated from a building or structure on top of it. Separating the value of land and buildings requires some theoretical assumptions. Furthermore, it can (and will) be questioned whether all land should have a value, in particular land owned by the government that can not be used for any private purpose. A final issue concerns the difference between ownership of land and use of land. Since letting of land does not fall within the production boundary, problems with the consistency between inputs and outputs may arise.

Section 3.1 deals with all these valuation issues. Section 3.2 discusses the methods that are used to estimate the balance sheet for different types of land. Section 3.3 describes how the balance sheets are broken down by industry and institutional sector.

Valuation issues

How to value land?

Like for any other asset category the preferred way to value land is by using market values. These values could be derived from information on land transactions, i.e. sales and purchases of land. For agricultural land this method can be applied quite easily. However, land very often changes hands together with buildings and structures. Using land values derived from transactions without buildings as a proxy for land values underlying buildings and structures may easily lead to downward biases. The reason for this is that most land without structures is located at the outskirts of cities or in rural areas, whereas most land underlying buildings is located within cities. Land prices in urban areas are often much higher than the land prices in rural areas.

[4] For the period 1953-1968, only volume changes are used to construct the time series. Therefore, the time series for this period is in prices of 1969.

The only alternative to estimate these land values is to separate the value of buildings from real estate transaction prices. These transactions usually include the value of land together with the value of buildings or structures on the land surface. Separating building values from real estate transaction prices would do the trick. In this context it is important to notice that the value of two identical houses (or buildings) may differ on different locations. Such price differences are for example the outcome of differences in the presence of environmental and other amenities (e.g. the presence of recreational parks, highways, public services, job opportunities)[5]. The benefits and inconveniences of a particular neighbourhood are obviously reflected in the land component of real estate prices. By buying a piece of land you will also buy the quality of its surrounding area.

This treatment of a building as an asset that may be put on any land leads to a useful definition of the building itself: *the value of a building or structure, excluding the land on which it is built, is equal to the depreciated cost of producing the building or structure*. Since the depreciated value of the buildings and structures can be measured (at a macro or meso level) with the Perpetual Inventory Method (PIM), such measures can be used to derive land values from real estate values.

Scope of balance sheets for land

In the ESA all land subject to ownership should be valued on the basis of its market price. In cases where ownership cannot be identified, the government could be considered the land owner by default. This means that all land within the borders of the national territory should in principle be represented in the nation's balance sheet, although some land values, like remote and inaccessible deserts or tundra's, may be close to zero. One may expect that all privately owned land has positive values. For certain parts of government owned land, like land underlying roads, however one may argue that the value of this land is already included in the value of adjacent land. Including a value for this government owned land in the balance sheet would in this case lead to double counting. On the contrary, one may argue that this surplus value of the adjacent land is a spill over effect and that the government owned land should be valued as well. However, this is only the case when the government owned land has a demonstrated value on its own. This self standing asset value does not seem to exist for roads that have only one function, namely giving access to residential areas.

This double counting issue arises when the value of privately owned land is based on the expectation that the government will neither sell land nor will change its use. This may for example be the case with land underlying roads and public parks. The value of most privately owned land depends, among other things, on its accessibility to the public infrastructure. An accessible house (including the land) has usually a higher value than a remote house next to a dirt road. This surplus value is created by roads or public means of transport with which the house is easily accessible. This surplus value follows the landowners trust that the government will neither sell the land underlying these roads nor will use it for other purposes. As soon as the government would reallocate the land underlying roads the adjacent privately owned land would quite likely decrease substantially.

A second argument against valuing land underlying roads is that it does not seem to have a real market value as long as it is used as such. In the Netherlands, as in many other countries, the government develops spatial zoning plans in which the use of land to various purposes (agriculture, dwelling, office locations, nature, etc.) is being predetermined. Land prices are very much determined by the kind of economic activities this land is allowed to be used for. Changes in zoning plans will lead via the other changes in volume of assets (a reclassification of land use) to changes in the national balance sheet positions for land.

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5 It is assumed that the cost to build both (identical) houses is identical, and that both pieces of land have the same quality.

Based on these arguments, but also due to measurement difficulties, land underlying public infrastructure is not valued as such in the Dutch national balance sheet for land. Only government owned land underlying buildings and structures (AN.2111), land under cultivation (AN.2112) and construction land (Part of AN.2119?[6]) is included. Excluded is all government owned recreational land and associated surface water (AN.2113) and other land and associated surface water (AN.2113).

Land ownership versus land use

Like any other asset type, the value of land should be recorded in the balance sheet of its economic owner. However, the owner is not necessary equal to the (only) user of land. At least two situations can be distinguished. Firstly, the land owner (usually the government) may provide free access to the land as a public service. This is for example the case for land underlying roads or with public parks. A second possibility is that the landowner charges users for using the land. Examples are the rent of agricultural land or land underlying buildings. The building itself may, or may not be subject to the rental agreement. Land rents, or natural resource leases more generally, may create problems when accounting for the full cost of production including the use of natural resources like land.

According to the ESA the income generated by resource leases should be recorded as property income. This means that rent payments are not directly reflected in the production (or income generation) account of the land user. Instead property income is recorded in the income distribution account. For the tenants (for example farmers) the national accounts register the production associated with the use of the land (agricultural output) but no cost for using the land. Production accounts therefore wrongfully show large profits. In productivity measurement this may lead to large errors, since multi-factor productivity can be seen as the real component of the change in profitability.[7]

The best solution to this problem would be to extend the production boundary to include letting of non-produced assets. This way, a resource lease would be recorded as intermediate consumption by the user, leading to consistency between production and inputs. Unfortunately, the ESA has to be followed. This option is therefore not feasible.

The solution is to attribute the use of land and the cost of using the land to the user of the land instead of to the owner. As a consequence, if balance sheets by industry are compiled, land and other non-produced assets should be recorded on the balance sheet of its user instead of on the balance sheet of its owner.

Measurement issues

In the Netherlands the land use statistics is a key source in the compilation of balance sheets for land. Land use statistics provide a breakdown of all land (and inland water bodies) in the Netherlands into types of land. They are based on aerial photographs and are published about every three years. Using land use statistics ensures consistency between the sum of the areas of all types of land and the total area of land in the Netherlands.

A disadvantage of the land use statistics is that they are not consistent with the classification of land in the SNA or SEEA. Land under small roads within a neighbourhood is for example classified as land underlying dwellings. Furthermore, the delineation of an area of land is not necessary conform the SEEA,

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6 The ESA does not state clearly under which asset type land like construction land, land underlying graveyards and dumping grounds should be recorded.

7 This interpretation is not possible when the neoclassical model is used, since in this case, profits are zero by definition.

for example when associated surface water is involved. However, the land use statistics are still the most comprehensive source available.

Agricultural land

Agricultural land is divided into two separate groups: open farmland and land underlying greenhouses. The scarce data that exist about the difference in prices between land for cattle breeding and land for arable farming show that these prices are fairly equal, so a division of land into these two kinds of open farmland does not provide much extra quality to the estimates. Open farmland is further divided into leased and non-leased land. Data shows that the average price for land encumbered with a lease is about half the price of land without a lease on it.

The agricultural census is being used for interpolation and extrapolation of open farmland estimates that are derived from the land use statistics. This census provides yearly data on the use of agricultural land. The agricultural land surface according to the agricultural census is about 18 percent lower than the land surface derived from land use statistics. Unlike the agricultural census, the land use statistic includes for example farmyards and the land underneath farms. The rate of change in agricultural area is about the same for both statistics, so the agricultural census can still be used for the interpolation and extrapolation of the data from the land use statistics.

For the price per hectare of agricultural land several data sources are being used. For different time periods different organisations have been responsible for measuring the price of agricultural land. The most recent data source is the Economic Institute for Agriculture (LEI). All data sources provide the weighted average price per hectare of agricultural land for the whole of the Netherlands, as well as for different regions. Since the resulting prices from the different data sources are within 1 percent of each other, they are treated as a continuous time series. [8]

The value of the agricultural land is subsequently estimated by multiplying the agricultural area with the price per hectare. This means that farmyards and land underlying farms get the same price as the "actual" agricultural land.

For land underlying greenhouses, neither the areas nor the rate of change in areas from the agricultural census are anything like the data from the land use statistics. The main reason is that greenhouses are increasingly used for non-farm purposes, like storage of camper trailers and vans. The agricultural census only registers the land that is actually used for greenhouse farming. Since other data sources are unavailable, linear interpolation and extrapolation is used to estimate the area of land underlying greenhouses. Land underlying greenhouses is subsequently split into agricultural land and land underlying structures. The estimated area of agricultural land is derived from the agricultural census while the remainder is classified as land underlying structures. Since all land underlying greenhouses may be used both for farming and non-farm purposes, it is assumed that prices are equal for both types of land use.

Data from the LEI is used to value land underlying greenhouses. The LEI provides land prices excluding the greenhouses itself but including infrastructure like the connection to the grid. It is not clear whether it will be possible or even necessary to exclude the value of grid connections. Since the grid is constructed and owned by private parties who are able to sell it, this case probably does constitute a spill over. Another problem with the data is that the price per hectare of land underlying greenhouse depends on how square the area is. A square area is cheaper to heat and therefore the price of the underlying land will be higher. Unfortunately good data on the contours of greenhouses is unavailable. Some assumptions are therefore needed to estimate the average price of land underlying greenhouses. The resulting price per

[8] Comparison is possible because of overlapping time periods.

hectare is subsequently multiplied by the total land area underlying green houses to arrive at a total value of land underlying greenhouses.

Land underlying dwellings

The value of land underlying dwellings is measured as the value of the dwelling including the land minus the depreciated cost of building the dwelling. The value of the dwelling including the land is derived from tax registers. In the Netherlands for tax purposes the (so called) WOZ-value of every dwelling including land is registered.[9] This value is based on actual prices of dwellings sold and therefore provides an accurate estimate of the market price, except for the fact that all dwellings are registered in prices of a few years back. In order to estimate the value at current prices, the price index for existing owner-occupied dwellings is used. Although this price index takes hold of price differences between different kinds of dwellings, it does not correct for the on average increasing size of dwellings in time. As such the price index probably suffers from an upward bias. No data on the size of this bias is available, so for the time being the expected bias is being ignored.

The Perpetual Inventory Method (PIM) is used to determine the depreciated cost of dwellings. The PIM measures the net value of dwellings excluding the underlying land, but including the depreciated value of ownership transfer cost. Since the WOZ-value is the price for which the dwelling is expected to be sold, it excludes the transfer of ownership cost. For estimating the value of land underlying dwellings, the PIM-value excluding transfer of ownership cost is therefore subtracted from the WOZ-value.

Not only land values but also volume changes in land use can be derived from the above mentioned sources. It is important to emphasize that the volume change of land is not necessarily equal to change in concomitant land areas. This is because land underlying dwellings can not be treated as a homogeneous asset. Land in the middle of a city has usually a much higher value and is therefore economically speaking of a higher quality than land in smaller villages. In practice, the volume change of land underlying dwellings appears to be higher than the increase in the area of land underlying dwellings. This is consistent with the observation that in the Netherlands a larger part of dwellings are being built in the highly populated areas where land prices are above average. However, more research is still needed to determine whether the results are plausible.

Land underlying non-residential buildings

In principle the value of land underlying non-residential buildings can be estimated in a similar way as the value of land underlying dwellings. A WOZ-value is available for almost all non-residential buildings. Excepted are tax exempted buildings like churches. The main difference is that the WOZ-value for non-residential buildings including land cannot be used directly. Unlike dwellings including land, the WOZ-value for non-residential buildings including land is not based on actual transactions. The reason for this is that there are few actual transactions in non-residential buildings. For estimating the WOZ-value of non-residential buildings including land, various methods are being applied by the tax authorities. When possible, the net present value of future rentals is applied as a valuation method. In other cases, the depreciated value of construction costs is estimated based on extensive guidelines.

In theory, the WOZ-value is a good estimate of the value of the non-residential buildings including land. In practice however, the PIM-value of the non-residential buildings (excluding land) is higher than the WOZ-value of the building including land. The service lives in the PIM are quite similar to the

[9] In the Netherlands, some taxes are based on the value of the dwelling or building that people own. This is laid down in the Dutch Real Estate Appraisal Act (WOZ). The value that the government subsequently assigns to each dwelling and building is called the WOZ-value.

guidelines for estimating WOZ-values so this can only explain a minor part of the difference in value. The major part of the difference might however be caused by the depreciation profile. In the PIM, the depreciation profile is in accordance with the OECD handbook *measuring capital*, which leads to a depreciation profile that is approximately geometrically shaped. The WOZ-values are based on a linear depreciation method. Since linear depreciation profiles lead to lower net values than geometric ones, this might explain the unexpected difference between the two estimates.

Therefore, the PIM-value of non-residential buildings (excluding transfer of ownership cost) is recalculated with a linear depreciation profile. This value is subtracted from the WOZ-value revaluated to current prices to arrive at the estimate of the value of land underlying non-residential buildings. The revaluation is necessary since the WOZ-values are registered at prices of a few years back. The WOZ-values of 1996 to 1999 are registered in prices of (the end of) 1994, the WOZ-values of 2000 to 2003 are registered in prices of 1998, the WOZ-value of 2004 and 2005 are registered in prices of 2002, the WOZ-value of 2006 is registered in prices of 2004 and the WOZ-value of 2007 is registered in prices of 2006.

The price index of the WOZ-values is based on the WOZ-register. First, the direct average change between two years is calculated as the change in the WOZ-value of all buildings that are registered in both years. This change in value is however the effect of both price changes and of consumption of fixed capital. Since linear depreciation is used, the depreciation on a building is one over the service life (37 years), about 2.7 percent. This is however the depreciation of the building, not of the building including the underlying land. Since the value of the building is 65 to 75 percent of the value of the land (a rough can be made by using price indices without a correction for consumption of fixed capital), the consumption of fixed capital on the building including land is around 1.9 percent. A correction of 1.9 percent for the consumption of fixed capital would however be too high, since most buildings are regularly improved to counter some of the effects of the aging of the building. Since the WOZ-values that are compared are WOZ-values including recent improvements, this improvement has to be taken into account. It is assumed that half of the consumption of fixed capital on buildings is countered by new investments on the building. This leaves a correction of 1 percent for the aging of the buildings. The price index for the WOZ-value is therefore estimated as the index of the direct value change of existing buildings multiplied by 1.01.

Since WOZ-values of 2003 are registered in prices of 1998 and WOZ-values of 2004 are registered in prices of 2002, it is not possible to directly estimate the price change between 1998 and 1999. It is only possible to estimate the average price change for longer periods of time, in this case between 1998 and 2002. Where only average price changes over a longer period are available, it is assumed that the price changes within this period have the same structure as the price changes in owner-occupied dwellings.

With these price indices, the WOZ-values of each year can in theory be revaluated directly to current prices. In practice however, the WOZ-values in years without a revaluation of the WOZ-value (for example 2001, 2002 and 2003) are slightly overvalued. It appears that not all buildings that are demolished are directly removed from the WOZ-register. Some buildings remain in the register until the WOZ-values of all buildings are revaluated (in this case in 2004). Only then they are removed from the register. For this reason the value (as well as the volume change) is too high in the years between revaluations. In the year of revaluation, the volume change is too small but the value is measured correctly. For this reason, the WOZ-values in the years between revaluations are recalculated. First, the average volume change of the buildings including land in the period between two revaluations (for example 2000 and 2004) is calculated. This volume change is subsequently spread out over the underlying years according to the ratios between the volume changes of the buildings only as estimated with the PIM. These recalculated WOZ-volumes are revaluated to current prices. Subtraction of the value of the buildings finally leads to the value of the land underlying non-residential buildings.

This method can be applied to all years for which a full WOZ-register is available. When this paper was written however, the WOZ-registers for 2006 and 2007 were not yet complete. As a consequence, the WOZ-value and the volume change of the buildings including land could not be estimated directly, although price changes could be estimated.[10] For these years, and for 2008, it is assumed that the average ratio between the volume change of buildings (from the PIM) and the volume change of buildings including land remains constant in time. In practice, this means that the volume change of buildings including land is set at 85 percent of the volume change of the buildings.

The last remaining issue is estimating a price index for 2007 and 2008. The most recent WOZ-values are registered in prices of 2006. The method described above for estimating price changes can therefore only be applied up until 2006. For the years 2007 and 2008, instead of estimating a price change for buildings including land, a price index for the land only is used. It is based on the price changes of land that the government sells for the construction of non-residential buildings on it. This price index is probably biased, since newly sold land is often, if not always, on the outskirts of cities and not in the centre. It is however the only data available. When a new WOZ-register becomes available, a better estimate of the price change for these most recent years can be made.

Assigning ownership and use

The use of land balance sheets for productivity accounts requires a breakdown of these balance sheets by institutional sectors as well as by industries. The institutional sector classification is particularly used to calculate net worth estimates. The breakdown by sector is based on ownership. The industry classification is particularly useful for productivity measurement which is based on the kind of economic activity that uses the land in production (not necessarily the owner). The industry classification poses the biggest problems and is therefore discussed first.

Industry classification

Agricultural land

All open farmland is assigned to the industry agriculture, forestry and fishing. This includes all land underlying greenhouses used in agricultural production. For land underlying other greenhouses, an estimate is made of the area (and value) of land that is occupied by garden centres. It is based on the number of garden centres and their average size. This value is assigned to the industry retail trade and repair. It is assumed that all other land underlying greenhouses are sidelines of agricultural companies. The value is therefore assigned to agriculture, forestry and fishing.

Land underlying dwellings

When a dwelling including the underlying land is leased, the combined payment is in the national accounts recorded as the sale of a service. In this case, the lease of the land and the income generated by it fall within the production boundary. The land should therefore be placed on the balance sheet of the lender of the land. When only the underlying land is leased (separately form the building), the lease falls outside the production boundary and the lessee is therefore deemed the user.[11] In the Netherlands, land underlying dwellings is used by the real estate industry (including owner-occupied housing), insurance and pension funds and by the government. At the moment, the division of land underlying dwellings by industry is based on the distribution of the value of dwellings.

[10] Since price changes are based on buildings that are in both registers, the only effect of an incomplete register is that the sample of buildings is slightly smaller.

[11] For land underlying non-residential buildings the same argument applies.

In future research, a method will be explored in which land assigned to insurance and pension funds will be based on annual business reports. Subsequently, a division of land underlying dwellings between the real estate industry and the government should still be made. Estimates will primarily be based on data on land leases, Land leases are common practice in some cities. Apart from land lease the government also owns dwellings (including the underlying land). However, this is only 0.3 percent of all dwellings. Assuming that the value of land underlying these dwellings is equally 0.3 percent of the value of all land underlying dwellings will probably not give rise to large errors.

Land underlying non-residential buildings

Dividing land underlying non-residential buildings into industries poses the biggest problems. Since some industries are located in densely populated areas (retail trade, hotels and restaurants) while others are located in less densely populated areas (manufacturing), the ratios in the value of non-residential buildings excluding land are probably not a good source for dividing the value of the land underlying non-residential buildings.

An attempt was made to link the WOZ-register with the business register. The WOZ-register records among others the address and value of the building, and the name of the owner. The industry of the owner is not recorded. The business register records name, address and industry of all businesses. When these registers are linked, value by industry would become available. Unfortunately, this proved to be unfeasible because business names in both registers are not standardised. As a consequence, it was only possible to match a subset of all businesses. Linking addresses also failed. Business registers record the contact addresses of the companies. When several companies are located in the same building, it is impossible to determine which of them, if any, is the owner. Moreover, not all records in the WOZ-register have a corresponding record in the business register. If a company has several locations, only the location that is also its postal address is registered in the business register. Due to these and other problems, the resulting link between the WOZ-register and the business register proved incomplete and very biased. In conclusion the registers could not be matched.

This means that some sort of shortcut seems unavoidable. An option that is currently investigated is to divide industries into two groups: (1) industries with a relatively high ratio between land values underlying non-residential buildings and the values of the buildings and (2) industries with relatively low ratios. The first group consists of industries occupying buildings with a restricted number of floors that are primarily located in town centres and cities. Higher buildings are more expensive to build than lower buildings and therefore usually have a lower ratio between land and building. The assumption is that the first group consists mainly of retail trade, hotels and restaurants, and education. For now, it is assumed that the ratio between land and building in the first group is 2 times the ratio in the second group. With this assumption, an adjusted PIM-value by industry is made for non-residential buildings, in which the value of non-residential buildings in the first group is doubled. The thus created distribution of the value of non-residential buildings by industry is used to divide the value of land underlying non-residential buildings into industries. In future research, an exception will be made for banking and insurance companies, for which information from annual reports will be used.

Ownership by institutional sector

Unlike the balance sheets by industry, the balance sheets by institutional sector will be based completely on ownership. The first step in estimating balance sheets by institutional sector is producing balance sheets by industry of the owner. In most cases, the using industry is also the owning industry in which case the owning industry can be determined directly. The exceptions are leased agricultural land and land underlying buildings that is leased apart from the building. For agricultural land, the agricultural census provides for some years data on the part of the land that is leased. This is combined with a

government report on ownership of agricultural land to arrive at ownership of agricultural land by industry. Most separately leased land underlying buildings is let by the local government. Data on government rental income is used to estimate ownership by industry.

The next step is producing estimates by institutional sector. Some industries, like banking, insurance, mining and quarrying and public administration, belong only to one single institutional sector. In these cases, the value of land by institutional sector can be determined straightforwardly once the information on industry branch level is available. In all other cases, including agricultural land, the distribution of land ownership by sector is assumed to correspond to the distribution of dwellings and non-residential buildings ownership by institutional sector.

SUBSOIL ASSETS

Several different types of subsoil assets exist in the Netherlands: oil, gas, clay, peat, sand, salt, gravel and limestone. Coal reserves also exist in the Netherlands, but extraction of coal is not economically feasible. The economic value of coal is therefore zero, so coal is excluded from the subsoil assets.

For estimating the value of the subsoil assets, the different types of subsoil assets are divided into two classes: assets with a 'finite' reserve and assets with an 'infinite' reserve. A truly infinite reserve of a subsoil asset does of course not exist. However, for some assets the ratio between the physical extraction and the reserves is so small that extraction is guaranteed for the foreseeable future. For practical reasons, which are explained in section 4.2, it is assumed that the reserve of these assets is infinite.

In the Netherlands, the government sector is the owner of all subsoil assets. Companies that wish to extract subsoil assets have to hand in an extraction plan to the government. The government then decides if the plan needs to be revised or that it is approved.

Section 4.1 deals with the subsoil assets with a 'finite' reserve: oil and gas. The other subsoil assets are discussed in section 4.2.

Oil and gas reserves

An extensive description of the methods for estimating the oil and gas reserves is given by Veldhuizen et al (2009). In this report, only a short overview is presented.

The value of an asset in the national accounts should reflect the value that the asset would get if it were traded in an open market. Since observed market values for transactions in oil and gas reserves are not widely available, the net present value method is used to give a monetary value to the physical stocks of reserves. The future income flow is calculated by multiplying projected yearly physical extractions with the expected income per unit of the reserves (unit resource rent).

For estimating the physical extractions, both data on the available reserve and data on the extraction schedule are required.[12] Data on the available reserves (and on the physical extraction) have been derived from the series of reports 'Oil and gas in the Netherlands, 1987 – 2007' by TNO, the Netherlands Organisation of Applied Scientific Research. The physical extraction schedules are based on the remaining reserves, on observed trends in the physical extraction of oil and gas and on government limits on the

[12] The future income is based on the expected extraction schedule at the moment of valuation, not on the actual extraction as is measured years later. The reason behind this is that we want to value the reserve at the moment the balance sheet is made. Data on the realised (future) extractions are not yet available at this moment.

yearly amount of gas that may be extracted. This results mostly in extraction schedules that are declining linearly.

The unit resource rent is calculated endogenously. The (exogenously estimated) user cost of capital of the fixed assets and the pure profits for sideline activities are subtracted from the gross operating surplus to determine the resource rent for the extraction of oil and gas.[13] Therefore, the resource rent has to be divided into a resource rent for oil extraction and a resource rent for gas extraction. Due to lack of data, the division is for now based on the ratio between the production values of oil and gas. More future research is required to arrive at a better division.

For both oil and gas, the resource rent is subsequently divided by the physical extraction to arrive at the unit resource rent. Due to large variations in the price of oil and gas, the unit resource rent is highly variable. Expectations of the future resource rent need not necessarily be as variable as the unit resource rent itself. For calculations of the net present value of future income it is therefore assumed that the (expected) future real unit resource rent equals the average resource rent in the last three years.

Other subsoil assets

The other subsoil assets are clay, peat, sand, salt, gravel and limestone. In principle, the value of the reserve should be estimated in the same way as the value of oil and gas reserves. Data on the physical reserves of these assets is however not available. One of the reasons for this is that the exact size of the reserves is relatively unimportant, since these subsoil assets are available in abundance. The amount of sand in the Netherlands is for example so large, that depletion of the reserves is not expected to occur anytime soon if ever. Estimating the exact size of the reserves is therefore not very important for describing the economic process. The relative insignificance of these other subsoil assets in terms of economic value is another reason that extensive research on the available reserves, as is done for oil and gas, is not carried out.

Since data on the reserves is not available and the physical reserves are much larger than the yearly extraction, it is assumed in the calculations of the net present value of future income that the reserves are infinite. As the net present value method heavily discounts income far in the future, the error made by assuming that the physical reserves are infinite instead of just being very large is relatively small.

A consequence of assuming the physical reserves to be infinite is that there is no longer any depletion of these subsoil assets. No matter how much the extraction, the remaining physical reserves remain infinite. Depletion is therefore nonexistent. For reserves that are very large compared with the extraction however, depletion is also very small (although not zero), so once again the error that is made in the monetary balance sheet is probably not very large, perhaps a few percent of the total value. Physical balance sheets for these subsoil assets are however unfeasible, since infinite numbers can obviously not be published in a balance sheet.

Since the physical reserve is assumed to be infinite, the physical extraction schedule is also endless. Declining extraction trends as used for the extraction of oil and gas are therefore not plausible. For the physical extraction schedule, for all subsoil assets it is assumed that the future yearly extraction equals the average extraction in the past three years. Data on the physical extraction are obtained from several government agencies.

The extraction of the other subsoil assets takes place in two different industries: the industry extraction of other subsoil assets and as a sideline in the chemical industry. It is unjustified to estimate the

[13] In the Dutch national accounts, extraction of oil and gas is classified in a single industry.

resource rent endogenously in an industry where the extraction of subsoil assets is not the primary activity. In the chemical industry, the pure profits of the main activities are many times bigger than the (expected) resource rent of the other subsoil assets, making it impossible to arrive at a plausible estimate of this resource rent. The unit resource rent is therefore directly estimated for the industry extraction of other subsoil assets only. For the extraction of subsoil assets in the chemical industry, it is assumed that the unit resource rent equals the unit resource rent for the corresponding subsoil asset in the industry extraction of other subsoil assets.

As for oil and gas, the resource rent of the other subsoil assets is calculated by subtracting the (exogenously estimated) user cost of capital of the fixed assets and the pure profits for sideline activities from the gross operating surplus. Micro data shows that in the years 2005, 2006 and 2007, the ratio between gross output and the resource rent is for most subsoil assets fairly similar.[14] The resource rent is therefore divided into the different types of subsoil assets according to the distribution of the production value into these subsoil assets.[15]

For all the different subsoil assets, the resource rent is subsequently divided by the physical extraction to arrive at the unit resource rent. For calculations of the net present value of future income it is, like with oil and gas reserves, assumed that the (expected) future real unit resource rent equals the average real resource rent in the last three years.

Since both the real unit resource rent and the yearly physical extraction are assumed to remain constant over (infinite) time, the net present value of future rentals can be simplified to the yearly expected (real) resource rent divided by the (real) discount rate. As a real discount rate is set at 4 percent, the value of the subsoil assets therefore equals 25 times the expected real resource rent.

RESULTS

Table 2 shows the balance sheet of non-financial assets for some selected years.[16] In 2008, the total value of the non-financial assets was approximately 3.5 trillion euro. This is more than twice the value in 1996. It is also almost 6 times as large as the value of GDP. Fixed assets are the largest asset type. The value of fixed assets in 2008 was almost 2 billion euro. Land accounts for another large part of the value of non-financial assets. The value of land underlying dwellings is close to 1 billion euro in 2008. This is approximately equal to the value of dwellings. In the Netherlands, land underlying dwellings thus comprises half of the value of dwellings including land. Land underlying non-residential buildings by contrast only account for 30 percent of the value of non-residential buildings including land. One of the reasons for this difference is that non-residential buildings are more often located at the outskirt of cities, where land prices are lower. Another reason is that non-residential buildings are often higher than dwellings, resulting in higher construction cost relative to the price of the land.

The value of the other three asset types, inventories, subsoil assets and consumer durables, is a lot smaller. At 79 billion euro, the value of inventories is the smallest among the non-financial assets.

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[14] For the extraction of salt, results are inconclusive. Furthermore, micro data on sand and gravel can not be separated, so it is not completely clear whether this ratio is also similar for the extraction of sand and gravel separately.

[15] For other subsoil assets, the method for dividing the resource rent into different types of subsoil assets is therefore equal to the method for dividing the resource rent of oil and gas. Unlike for oil and gas however, the division of other subsoil assets is supported by evidence from micro data.

[16] Table 6 in the annex provides the balance sheets for all years in the period 1996-2008.

Table 2. Balance sheet of non-financial assets

	1996	2000	2005	2008
	billion euro			
Fixed assets	1052	1302	1651	1892
Dwellings	447	579	801	934
Non-residential buildings	218	260	321	364
Other structures	192	221	271	312
Other fixed assets	195	242	259	282
Inventories	55	68	72	79
Materials and supplies	10	11	12	14
Work in progress on cultivated assets	1	1	1	2
Finished goods	14	17	17	19
Goods for resale	29	38	42	44
Land	264	753	1042	1212
Land underlying dwellings	174	568	839	979
Land underlying non-residential buildings	46	110	144	151
Land under cultivation	43	74	60	82
Subsoil assets	68	71	110	178
Oil and gas reserves	66	66	103	172
Other subsoil assets	2	4	6	6
Consumer durables	98	126	146	157
All assets	1538	2319	3022	3518

Table 3 shows the full sequence of accounts for 2006. Most of the change in the value of the non-financial assets is caused by revaluation. For practical reasons, trade in second-hand fixed assets and consumer durables is recorded under *other changes in assets*. In the case of consumer durables, the *other changes in assets* consist in 2006 completely of the purchases of second-hand cars.

Statistical discrepancies exist for inventories and before 2001 also for fixed assets. The statistical discrepancies in inventories arise because surveys of the closing balance sheet of a year and the opening balance sheet of the next year do not match. For fixed assets, the statistical discrepancies arise because of timing problems. During the national accounts benchmark revision of 2001, the balance sheet for 2001 (and thus all balance sheets before 2001 as well) had to be made before the time series of investments were fully integrated in the national accounts. This integration of the time series could only take place after 2001 was fully balanced, for which the consumption of fixed capital (and thus the balance sheet) for 2001 was required.

Table 3. Balance sheet of non-financial assets, 2006

	Opening balance sheet	Revaluation	Acquisition of assets	Other changes in assets [a)]	Closing balance sheet	Statistical discrepancy
	billion euro					
Fixed assets	1651,5	49,5	30,0	-2,3	1728,6	
Dwellings	800,9	29,1	19,1	0,1	849,2	
Non-residential buildings	321,2	10,7	1,6	-0,1	333,4	
Other structures	270,6	7,9	2,8	0,0	281,3	
Other fixed assets	258,8	1,8	6,5	-2,3	264,7	
Inventories	72,4	1,8	1,6	0,0	75,8	0,1
Materials and supplies	12,2	0,6	0,3	0,0	13,1	0,1
Work in progress on cultivated assets	1,3	0,1	0,0	0,0	1,4	
Finished goods	17,0	0,5	0,2	0,0	17,7	0,0
Goods for resale	41,9	0,6	1,2	0,0	43,7	0,0
Land	1042,2	50,3	0,0	5,1	1097,5	
Land underlying dwellings	838,9	45,1	0,0	4,9	888,9	
Land underlying non-residential buildings	143,5	3,4	0,0	0,2	147,1	
Land under cultivation	59,7	1,8	0,0	0,0	61,5	
Subsoil assets	109,6	30,0	0,0	-6,5	133,1	
Oil and gas reserves	103,1	30,9	0,0	-6,6	127,4	
Other subsoil assets	6,4	-0,9	0,0	0,1	5,6	
Consumer durables	146,5	-0,4	0,6	2,7	149,4	
All assets	3022,1	131,1	32,2	-1,1	3184,4	0,1

a) Includes trade in second hand assets.

Table 4 shows the non-financial balance sheet for 2008 by industry.[17] The balance sheets exist for 57 industry branches, but are shown for only 10. In the case of land under cultivation and subsoil assets, the value is shown on the balance sheet of the user, not the owner, as explained in chapter 3. Consumer durables are listed separately since they are not used in a production process and can therefore not be allocated to any industry.

Over half of the value of non-financial assets is allocated to the industry financial and business activities. Most of this value consists of dwellings including the underlying land, which is mostly allocated to the industry real estate activities.

Inventories are mostly allocated to manufacturing and trade. In manufacturing, the inventories mostly consist of materials and supplies and finished goods, whereas the inventories in trade are mostly goods for resale. In the other industries, inventories are unimportant. Land is important in agriculture. In this industry, the value of land is more than twice the value of the fixed assets. Subsoil assets are mostly restricted to mining and quarrying, although some extraction takes place as a sideline in the chemical industry.

17 Table 7 in the annex provides the balance sheets by industry for the years 1996-2008.

Table 4. Non-financial assets by industry, 2008

	Fixed assets	Inventories	Land	Subsoil assets	Consumer durables	Non-financial assets
	billion euro					
Agriculture, forestry and fishing	45	2	93	0	0	141
Mining and quarrying	34	0	0	177	0	212
Manufacturing	135	35	14	1	0	184
Electricity, gas and water supply	49	0	2	0	0	51
Construction	14	2	2	0	0	17
Trade, hotels, restaurants and repair	62	40	21	0	0	123
Transport, storage and communication	105	0	7	0	0	113
Financial and business activities	1057	0	1003	0	0	2061
General government	305	0	50	0	0	354
Care and other service activities	86	0	20	0	0	105
Private Households	0	0	0	0	157	157
Total economy	1892	79	1212	178	157	3518

Table 5 shows the non-financial balance sheets for 2008 by institutional sector[18].

Almost half of the total value of non-financial assets is owned by the households sector. Most of this value consists of dwellings and land underlying dwellings.

Table 5. Non-financial assets by institutional sector, 2008

	Fixed assets	Inventories	Land	Subsoil assets	Consumer durables	Non-financial assets
	billion euro					
S.11	711	72	332	0	0	1115
S.12	35	0	21	0	0	55
S.13	350	0	58	178	0	586
S.14	794	7	801	0	157	1759
S.15	2	0	1	0	0	3
Total economy	1892	79	1212	178	157	3518

SUMMARY AND FUTURE RESEARCH

This paper presents the non-financial balance sheet for the Netherlands for the period 1996 to 2008. It includes data on fixed assets, inventories, land, subsoil assets and consumer durables. The balance sheet is however not yet complete. The most important missing assets are valuables, construction land and recreational land, and intangible non-produced assets. Although the balance sheet is not complete, it probably represents the larger part of the total value of non-financial assets in the Netherlands.

A range of different methods is used to estimate the value of the various asset types. For fixed assets (except livestock) and consumer durables, the Perpetual Inventory Method is used. Long time series of

[18] Table 8 in the annex provides the balance sheets by institutional sector for the years 1996-2008.

investments and consumption by asset type are combined with estimates of service lives to approximate the market value of these assets.

Estimates of the value of inventories are based on surveys by industry. To estimate the revaluation of inventories, data by commodity are required. For this breakdown by commodity, data on output and intermediate use by commodity are used. For manufacturing, these calculations are made on the firm-level. For trade, an industry level is used instead. For business services, no breakdown by commodity is made.

For agricultural land, direct observed sales prices are combined with land use statistics to arrive at the value. For land underlying dwellings and non-residential buildings, tax registers are used. These registers provide the value of (almost) all real estate objects. The value of land underlying dwellings and non-residential buildings is calculated as the residual of the real estate value and the value of the building itself. The breakdown of the land by industry is based on the breakdown of dwellings and non-residential buildings by industry.

The value of subsoil assets is estimated as the net present value of the expected future resource rent. The resource rent is estimated endogenously by subtracting the user cost of capital of fixed assets from the gross operating surplus. For estimating the future resource rent, the unit resource rent is assumed to remain constant over time. This unit resource rent is combined with expected physical extraction schemes to arrive at the future resource rent.

Several issues remain outstanding. First, the estimates of land are incomplete. Construction land and privately owned recreational land are not yet included in the figures. Furthermore, land underlying tax-exempted buildings, like churches, are excluded in the figures, since no data on the value of these real estate objects is available from the tax registers. Future work should provide estimates for these types of land.

Second, the breakdown of land by industry needs improvement. For the banking and insurance industries, data from company reports might be used to estimate the value of land. The breakdown of the other industries should also be improved. Using the breakdown of buildings and dwellings by industry poses problems when price changes vary across industries. A relative price increase in an industry leads to a higher share of this industry in the total value of the buildings, and thus to a higher share in the volume of land. A relative *price* increase therefore leads to a *volume* increase in land. A way forward might be to use the breakdown of the volume change in buildings by industry to divide the volume change of land into industries. This method needs to be explored further.

Third, due to data restrictions with regard to the costs for producing oil and gas, the resource rent was divided between oil and gas based on relative production values. This is probably an inaccurate assumption, because experts indicate that the cost per unit of extracted oil are larger than the cost per unit of extracted natural gas. As a result, the resource rent for oil and the monetary value of oil reserves are likely to be inflated. In future research, we will try to arrive at better estimates based on cost differences between the extraction of oil and natural gas.

Fourth, it should be explored to what extend it is possible to extend the non-financial balance sheet with more assets. Water resources and non-cultivated biological resources are likely to be small. The value of intangible, non-produced assets, like purchased goodwill, brand names, the radio spectrum and dairy quota might however be quite substantial. Further research into these assets is required.

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Annex Complete balance sheets for the years 1996-2008

Table 6. Balance sheet of non-financial assets

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	billion euro												
Fixed assets	1052	1097	1152	1218	1302	1400	1486	1553	1600	1651	1729	1799	1892
Dwellings	447	471	498	534	579	634	686	730	765	801	849	887	934
Non-residential buildings	218	224	233	244	260	280	296	306	313	321	333	345	364
Other structures	192	196	202	209	221	235	248	262	265	271	281	294	312
Other fixed assets	195	206	218	231	242	251	255	256	256	259	265	273	282
Inventories	55	58	61	63	68	70	71	71	69	72	76	76	79
Materials and supplies	10	10	10	11	11	11	12	12	12	12	13	14	14
Work in progress on cultivated assets	1	1	1	1	1	1	1	1	1	1	1	1	2
Finished goods	14	14	16	15	17	18	19	18	17	17	18	18	19
Goods for resale	29	32	34	36	38	39	39	40	39	42	44	43	44
Land	264	348	437	581	753	853	904	934	990	1042	1098	1167	1212
Land underlying dwellings	174	238	307	421	568	661	715	743	792	839	889	948	979
Land underlying non-residential buildings	46	62	77	96	110	114	117	124	137	144	147	149	151
Land under cultivation	43	47	53	64	74	77	72	66	61	60	62	70	82
Subsoil assets	68	76	76	69	71	87	100	103	99	110	133	149	178
Oil and gas reserves	66	74	72	65	66	81	94	96	92	103	127	143	172
Other subsoil assets	2	3	3	4	4	6	6	7	7	6	6	5	6
Consumer durables	98	102	109	117	126	136	143	146	146	146	149	154	157
All assets	1538	1682	1834	2048	2319	2546	2704	2806	2904	3022	3184	3345	3518

Table 7. Non-financial assets by industry

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	billion euro												
Agriculture, forestry and fishing	78	84	91	104	117	122	120	115	111	112	115	125	141
Mining and quarrying	94	104	105	99	101	119	133	137	129	139	165	182	212
Manufacturing	136	141	148	153	161	167	171	170	170	172	175	179	184
Electricity, gas and water supply	39	40	41	42	43	44	44	44	48	48	48	49	51
Construction	10	11	11	13	13	15	16	15	15	15	16	16	17
Trade, hotels, restaurants and repair	74	80	86	94	101	105	107	110	112	116	119	120	123
Transport, storage and communication	65	68	73	80	88	94	97	100	101	102	105	108	113
Financial and business activities	687	782	887	1047	1249	1406	1518	1594	1683	1770	1873	1976	2061
General government	205	214	224	237	251	266	280	296	305	312	325	338	354
Care and other service activities	51	55	58	63	68	72	75	79	84	89	94	99	105
Private Households	98	102	109	117	126	136	143	146	146	146	149	154	157
Total economy	1538	1682	1834	2048	2319	2546	2704	2806	2904	3022	3184	3345	3518

Table 8. Non-financial assets by institutional sector

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	billion euro												
S.11	566	611	658	724	803	864	907	931	960	991	1031	1073	1115
S.12	43	47	53	59	67	72	70	68	65	61	60	56	55
S.13	298	317	329	337	357	391	420	440	447	467	505	536	586
S.14	629	705	792	925	1091	1218	1306	1364	1430	1501	1587	1678	1759
S.15	1	1	2	2	2	2	2	2	2	3	3	3	3
Total economy	1538	1682	1834	2048	2319	2546	2704	2806	2904	3022	3184	3345	3518