Trends in and structure of the overall capital stock

The size and composition of the overall capital stock are of major importance for an economy. The stock of production facilities not only constitutes a major part of a nation's assets; in addition, it largely determines that country's economic capacity and labour productivity. As a factor of production, the capital stock is also an important vehicle of technical progress and thus offers additional scope for creating growth and real income. Another important point is its capacity to transfer consumption from the present to the future and to distribute real economic burdens more evenly between the generations. Not least the employment potential associated with the capital stock underscores the special economic significance of the stock of fixed assets, whose trend and structure in Germany are presented and analysed below.

Economic importance of the capital stock

A modern and efficient capital stock is the basis for achieving adequate and sustainable economic growth. It helps the economy to compete internationally and thus to secure a high level of prosperity. The conditions of production for the overall economy are decisively determined by the size and quality of the productive capital stock.
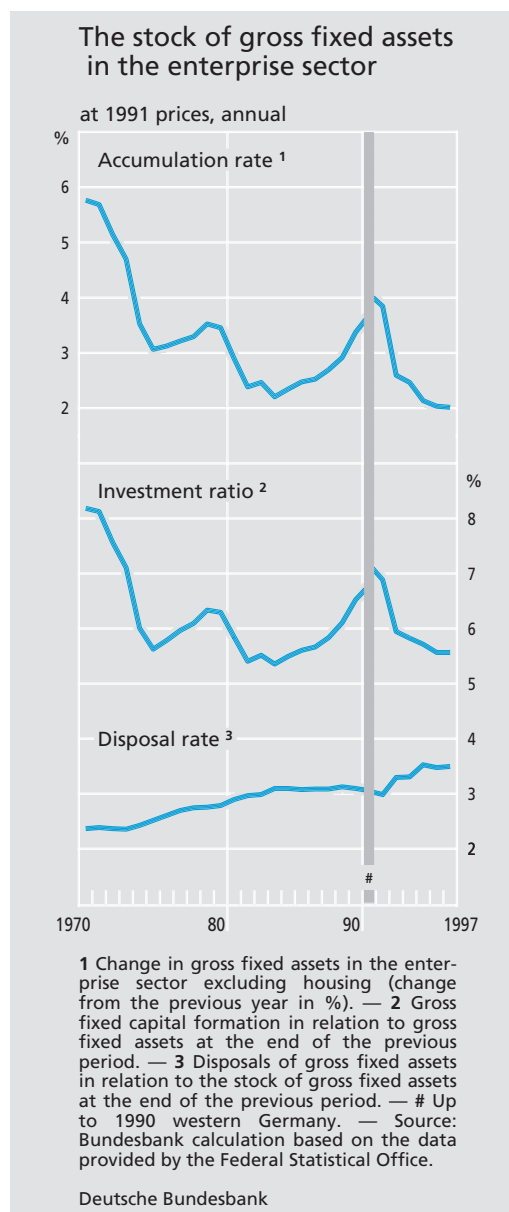
Obsolete capital stock in the GDR

The economic consequences of failing to develop the capital stock were graphically mani-

fested in eastern Germany prior to German unification. As a result of the directives of the centralised command economy and the bureaucratic division of labour within and between the former CMEA countries, the East German capital stock at that time was concentrated one-sidedly on certain goods-producing industries which were considered important. Even worse was the fact that, especially in the last few years of the existence of the former GDR, replacement investments were frequently not made, resulting in a rapid obsolescence of the capital stock and finally in its "abandonment" in favour of a rather modest level of current consumption. Finally, most of the capital stock in eastern Germany could not be employed profitably under the free-market conditions which superseded the old GDR command economy and thus constituted a serious economic burden in the process of German unification.

Flattening of the accumulation rate in western Germany

In western Germany, by contrast, the capital stock has expanded continuously; however, its growth has flattened distinctly in the recent past. For example, investment activity tended to be very subdued after the cyclical trough in 1993. Although there has been a distinct recovery in industrial investment in machinery and equipment recently, industrial construction activity has continued to decline. In 1998, too, overall fixed capital formation (excluding residential buildings) is unlikely to match the volume reached at the beginning of the nineties. This is all the more serious as an increasing portion has had to be spent on replacement purchases. The rate of retirement of enterprises' assets in relation to their fixed capital recently reached 3½%, which

The stock of gross fixed assets in the enterprise sector

at 1991 prices, annual

1 Change in gross fixed assets in the enterprise sector excluding housing (change from the previous year in %). — **2** Gross fixed capital formation in relation to gross fixed assets at the end of the previous period. — **3** Disposals of gross fixed assets in relation to the stock of gross fixed assets at the end of the previous period. — **#** Up to 1990 western Germany. — Source: Bundesbank calculation based on the data provided by the Federal Statistical Office.

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was almost ½ percentage point higher than ten years ago. It likewise contributed to the slower growth of the capital stock. Whereas in the old Länder the latter had still risen by just over 4% on annual average in the seventies and by 2½% per year in the eighties, the increase in the capital stock fell to 2% in 1997.

*Potential
effects*

This weak capital accumulation not only affects the overall demand for goods but also considerably restricts the supply potential (for a detailed analysis see the box on page 28). Whereas the overall production potential had risen by slightly under 2 ½ % per year in western Germany between 1982 and 1992, it grew by around 2 % per year in Germany as a whole at the end of the period under review; in the old Länder the growth rate was even somewhat lower. This flattening of the growth path of the production potential is not so much a reflection of changes in factor productivity but rather of declining fixed asset formation in Germany in the past few years.

*Labour market
effects*

This clearly had negative implications for the labour market, although the employment effects are dependent not only on how much is invested but also on what it is invested for. Here, diverse adjustment periods have to be taken into account. Thus if a decision in favour of a specific investment project has been taken, the related labour input is largely fixed for a certain period of time, too. Hence, it follows that the appropriate mix of capital and labour and the optimal investment volume depend not only on current factor prices and market conditions. What is more important are the profit and sales expectations, which are based on the period over which capital is tied up, and, above all, wage, tax and social policies that are conducive to stimulating growth and employment.

*Technical
progress*

In addition, the renewal of the capital stock is accompanied by continuous corresponding qualitative adjustments in the demand for labour. On the one hand, simple, often manual activities are frequently taken over by machines; on the other hand, the modernisation of machinery places higher demands on labour skills. Technical progress, which is reflected in process innovation and a renewal of the capital stock, is thus also reflected in a constant change of the labour profile required from employed persons.

Methodological aspects of computing the capital stock

The capital stock is generallly considered to comprise an economy's fixed assets in the form of machines and buildings and certain infrastructural facilities. It should be borne in mind, however, that the macroeconomic capital stock is a very heterogeneous aggregate which reflects diverse determinants and that the task of measuring it is beset with a number of difficulties. In considering the use of assets, one has to distinguish between assets assigned to consumption and those dedicated to productive purposes. Assets for consumption – which include consumer durables such as cars, household furnishings and appliances, but also residential buildings – give the beneficiary a fairly long period of utilisation in the form a given stream of consumption. They represent a distribution over time of a specific stock of consumption created in the present. Productive assets, by contrast, enable additional revenue to be generated through the efficient use of the factors of production. In the end, this additional revenue permits a greater measure of consumption than that foregone during the accumulation of the capital stock.

*Assets for
consumption
and production*

Investment, capital accumulation and production potential

Simplified, the basic equation for changes in the capital stock is as follows:

$$(1) \quad \Delta K_{t+1} = K_{t+1} - K_t = I_t - \delta \cdot K_t$$

where K_t represents the capital stock at the beginning of the year, I_t the gross fixed capital formation in the year t and δ the disposal rate (here assumed to be constant). If g denotes the rate of change of investment, the following relationship exists between the capital stock and investment:

$$(2) \quad K_t = (1-\delta)^t K_0 + \frac{(1-\delta)^t \cdot (\Theta^t - 1)}{\delta + g} I_0$$

$$t = 1, 2, \ldots; \quad \Theta = \frac{1+g}{1-\delta}$$

If a negative shock on investment is assumed (thereafter continuation of the growth path, albeit from this reduced level), this initially has an effect of the same magnitude on the capital stock. However, the negative effects are not just short-run, but lasting. The adjustment to the new (lower) equilibrium path is achieved faster, the higher the disposal and the growth rates are. After T periods the ratio of the adjustment already achieved to the overall adjustment requirement is given by the following equation:

$$(3) \quad z_T = 1 - \left(\frac{1-\delta}{1+g}\right)^T$$

If, by way of illustration, an equilibrium growth path of 2½% is assumed, then, given a disposal rate of 5%, only slightly more than 50% of the adjustment has been made after 10 years, compared with more than 70% at a disposal rate which is twice as high.

Although the capital stock will expand again at the rate g when it has reached the new (lower) accumulation path, until then growth losses have to be expected in the production potential. Assuming factor-unrelated technical progress (and excluding repercussions on the economy), the effect of the average an-

Potential effects caused by a negative investment shock

Annual loss of growth in percentage points	Disposal rate	
	$\delta = 0.05$	$\delta = 0.1$
in the year of the investment shock	0.2	0.3
after 1 year	0.3	0.5
after 2 years	0.3	0.4
after 5 years	0.2	0.3
after 10 years	0.2	0.2

Assumptions: Negative shock for investments of 10%; thereafter continuation of the growth trend (albeit starting from a lower level).

nual growth of the capital stock (w_K) on the rate of change of the production potential (w_Y) can be approximated as follows:

$$(4) \quad w_Y \approx \varepsilon_K \cdot w_K$$

with ε_K as the elasticity of production in relation to the factor capital. By way of a model calculation the table shows the direct effect which a negative investment shock has on the development of the production potential. A factor elasticity of 0.4 and an equilibrium growth rate of g = 2½% have been assumed.

The table shows that even a temporary weakness of investment translates into a lower dynamism of the production potential over several years. For example, based on the assumptions made here, the potential growth is 0.2 or 0.3 percentage points lower even five years after the investment slump compared with a reference scenario without such a slump. Based on the assumptions made, the persistent decline in the level (after the completion of all adjustment processes) associated with the transition to a lower potential growth path amounts to 4%.

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*Definition of
the stock of
fixed assets*

In its definition of the capital stock, the Federal Statistical Office largely applies the classification of fixed capital formation used in the national accounts, that means it applies the narrower definition of "fixed assets".[1] Correspondingly, the capital stock comprises the stock of durable reproducible means of production with the exception of goods which are used permanently for military purposes and households' durable goods. Residential buildings, however, are included in the stock of fixed assets even if they are owned by households. Means of production are classified as durable if they have a useful life of more than a year. The stock of fixed assets does not comprise land (including mineral resources). What is known as human capital and intangible assets are likewise excluded.[2]

*Machinery and
equipment and
buildings*

Fixed assets are normally broken down into machinery and equipment plus buildings. Machinery and equipment comprises the stock of machines, machine plant, cars, office equipment and other fixed assets which are not an inherent part of buildings. The fixed asset item "buildings" includes buildings and other structures such as streets, bridges, tunnels, airports, canals, dams, steel and wood structures as well as public utility pipelines and other pipelines which are used indirectly in the production process.

*Method of
calculation*

Since in practice a direct, current calculation of the stock of fixed assets from the statistical reports – although this would theoretically be desirable – can only be made with great effort, the Federal Statistical Office resorts – in line with international practice – to indirect methods of calculating the capital stock. The

fundamental idea is that the capital stock can be summarised as a stock variable, using the perpetual inventory approach, from the cumulative gross fixed capital formation (i.e. asset additions) over previous periods (for the details see the box on page 30). The disposals are deducted from the additions to take account of the consumption of assets in previous investment years caused by ageing and wear and tear. Whereas data on capital formation are available from GDP expenditure both at current and at constant prices, the data situation in respect of disposals is less favourable. The Federal Statistical Office estimates the useful life of the capital stock on an as deeply disaggregated basis as possible and thus tries to quantify disposals. The definition of the useful life of individual assets also serves to quantify the consumption of fixed capital. Deducting the cumulative decreases in value from the gross capital stock, using the straight-line method of depreciation – in line with international standards – yields the net fixed capital formation.

Hence, whereas the gross capital stock comprises all capital goods which remain in the production process, the net capital stock deducts the economic value consumed during the assets' life to date. Through its definition,

1 See: Federal Statistical Office, Fachserie 18 "Volkswirtschaftliche Gesamtrechnungen", Reihe S. 17 "Vermögensrechnung 1950 bis 1991", 1992.
2 The new European System of National and Regional Accounts (ESA 95), which will replace the current system in Germany next year, will also introduce an expanded concept of "investment" and hence a redefinition of produced assets. In future, it is also planned to include intangible assets alongside tangible fixed assets in investments and produced assets. Intangible assets include, for example, computer programs and copyrights.

The cumulative approach to calculating the capital stock

The cumulative approach, which is also known as the perpetual inventory method, is based on the assumption that the current capital stock is composed of fixed capital formation undertaken in previous periods. [1] The fact that assets have a finite useful life is additionally taken into account. This gives the following definitional relationship for the capital stock:

$$(1) \quad K_t^B = \sum_{s=1}^{T} I_{t-s} \cdot g(t, t-s)$$

where K_t^B represents the stock of gross fixed assets at the beginning of year t, I_{t-s} the gross fixed capital formation in the year t–s and g (t,t–s) a survival function which shows what proportion of the investment of the year t–s is still being used in the production process at time t. T is the maximum useful life of the investment.

To determine the survival function, the Federal Statistical Office resorts to deeply disaggregated investment series and calculates or estimates the respective average useful life for each component or goods category. However, it does not assume that the investment year of a goods category is eliminated completely at a given date. Instead, it is assumed that asset disposals are dispersed around the average useful life in the form of a bell-shaped curve. For this, the Federal Statistical Office resorts to the density function of the gamma distribution.

The connection between the development of gross fixed assets as a stock variable, on the one hand, and investment and disposals as flow variables, on the other hand, can also be represented by the following recursive equation: [2]

$$(2) \quad K_t^B = K_{t-1}^B + I_{t-1} - A_{t-1}$$

Looking at gross fixed assets, therefore, the capital stock grows precisely from the point at which gross fixed capital formation (I_{t-1}) exceeds the amount of disposals (A_{t-1}).

In contrast to this gross concept, in which assets are reported at their value on the purchase date for their entire useful life, the net fixed assets concept takes into account the decrease in value caused by wear and tear and ageing by deducting the consumption of fixed capital. Net fixed assets are derived by deducting from the gross stock the cumulative depreciation on the goods which are still being used at the reporting date. This consumption of fixed capital is determined according to the straight-line depreciation method. Analogously to the recursive equation (2) for the gross stock, the following applies to the net stock.

$$(3) \quad K_t^N = K_{t-1}^N + I_{t-1} - D_{t-1}$$

with the consumption of fixed capital D_{t-1} in the period t–1. The ratio of the net stock to the gross stock shows to what extent the value of fixed assets has already been diminished by use.

1 See: Lützel, H., "Das reproduzierbare Anlagevermögen in Preisen von 1962, Wirtschaft und Statistik 10/1971, pages 593 – 604 and Federal Statistical Office, Fachserie 18 "Volkswirtschaftliche Gesamtrechnungen", Reihe S. 17 "Vermögensrechnung 1950 bis 1991". — **2** Valuation at replacement cost additionally includes price-related changes in value.

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therefore, net fixed capital formation is an appropriate indicator of the (remaining) capacity of the production facilities.

Measurement problems

Reporting the capital stock at constant prices of a base year or at replacement cost requires a revaluation of total fixed assets (for the valuation approaches see the box on page 32). This is especially difficult when it comes to calculating the capital stock since it comprises goods of diverse investment years which differ not only in the price, but also in their efficiency.[3] However, the required price series are not always available, since, for example, some assets which are still included in the stock are no longer produced. In such cases, the Federal Statistical Office resorts to the price series for similar goods instead.

Lack of precision in the measurement also results from basing the approach on the useful life, since not only technical factors but also economic considerations play a role here. For example, a wrong estimate of the average useful life or of the distribution of the useful life would – as simulations of the Federal Statistical Office[4] have shown – result in particular in a level error in the assets and liabilities account. However, the trend over time of the asset stock would hardly be affected by that. Another question which arises is whether the economically relevant decrease in value is also subject to fluctuations over the course of the business cycle.

Development of the capital stock between 1991 and 1997

Despite the aforementioned statistical measurement problems, the existing data material allows some interesting conclusions to be drawn on the development of the capital stock in Germany. As far as possible, the special situation prevailing in eastern Germany is also examined.[5] However, owing to the comparatively low weight which the east German capital stock has in all-German gross fixed assets (10 % at the end of 1994), it may be assumed that the all-German figures described here for the period from 1991 to 1997 represent a continuation, in a somewhat weakened form, of trends which were already latent in the aggregates for the former western Germany.

The stock of gross fixed assets of all economic sectors, calculated at constant 1991 prices, increased by 2 ¾ % on annual average in the period under review. However, growth has decelerated distinctly over the course of time. Following quite considerable increases at the beginning of the nineties (slightly more than 3 ¼ % in both 1991 and 1992), the growth rates have fallen to just over 2 % in the past few years; hence – as already mentioned –

Slowdown since 1991

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3 Problems of interpreting capital stock data at constant prices arise especially if the monetary value of differences in quality is not adequately allowed for in the price differences for capital goods of different years. Experience has shown that this is particularly difficult in the case of products with rapid advances in quality and simultaneously declining prices such as computer equipment.
4 See: Lützel, H., Das reproduzierbare Anlagevermögen in Preisen von 1962, Wirtschaft und Statistik 10/1971, pages 593 – 604.
5 The Federal Statistical Office reported certain key data of gross fixed assets separately for the old Länder and the new Länder only up to the end of 1994.

The valuation of fixed assets

The Federal Statistical Office calculates fixed assets (both gross and net) using three different price concepts: at purchase prices, at replacement cost and at constant prices of a base year. [1] Which measurement concept is used for a particular analysis ultimately depends on the objective of the analysis.

For calculating fixed assets on the basis of purchase prices, the assets are valued at their respective purchase prices or, in the case of internally produced plant, at their historical production costs. This approach, which is the one applied in the tax and commercial balance sheets, shows the volume of funds expended in the past on the existing stock of tangible fixed assets. Changes in the value of the tangible fixed assets which have occured in the meantime or increased costs of reproduction are not taken into account.

By contrast, the valuation of fixed assets at replacement cost, which corresponds to the asset value method, shows the capital investment cost at the respective current prices. This necessitates an annual revaluation of the total stock of assets. The current prices of all goods existing in the stock are required for this calculation. For assets which are no longer produced in the reporting year, the price trends of comparable goods are taken instead. In the net calculation, i. e. after deducting the cumulative consumption of fixed capital, total fixed assets valued at replacement cost can be regarded as an estimate of the current market value of the capital stock.

Not to be confused with the asset value is the current market value, which indicates the estimated sales proceeds. Since representative markets for used plant exist only in rare cases, the Federal Statistical Office does not calculate the current market value. Nor does it use the earning capacity method, which focuses on the present value of future earnings of the existing stock of tangible fixed assets. Although the remaining useful life could be calculated from the assumed distributions of disposals, an appropriate internal discount rate in addition to the cash flow would have to be ascertained.

Reporting at constant prices shows the development of fixed assets in terms of volume or in real terms. The valuation at the prices of a specific base year (in Germany 1991 is currently used as the base year) eliminates the effects of price changes. The capital stock data derived in this way are particularly well suited to analysing relationships that are of interest for production theory, e.g. for estimating production functions or computing ratios such as capital productivity.

1 See: Federal Statistical Office, Fachserie 18 "Volkswirtschaftliche Gesamtrechnungen", Reihe S. 17 "Vermögensrechnung 1950 bis 1991" and Schmidt, L., "Reproduzierbares Anlagevermögen 1950 bis 1992", Wirtschaft und Statistik 2/1992, pages 115 – 124.

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they were below the average growth rate of 2½% achieved in western Germany in the eighties. Whereas in the old Länder the overall stock of gross fixed assets between 1991 and 1994 roughly followed the growth path of the eighties, the average rate of asset accumulation for the new Länder was almost 7%, not least owing to the low starting level and the massive investment subsidies granted by the government.

Fixed assets in the enterprise sector

A similar picture is obtained when analysing the stock of assets owned by the enterprise sector (excluding housing), which is the decisive variable for calculating the production potential. According to rough estimates, industrial gross fixed assets are likely to have risen by almost 2½% in the old Länder on annual average between 1991 and 1997, whereas the new Länder recorded a growth rate of around 8½%.[6] This indicates that the asset accumulation gap between east and west has remained largely unchanged up to the present. Nevertheless, the growth of the capital stock is likely to have decelerated distinctly in the new Länder as well in 1996 and 1997 owing to the slump in industrial construction.

Average age

The conspicuous surge in investment in the new Länder, especially in the first years following German unification, combined with numerous closures of unprofitable production facilities, also contributed to a slight fall in the average age of the all-German capital stock between 1991 and 1997, from 21.9 years to 21.7 years. A corresponding tendency can also be witnessed for the more narrowly defined aggregate of the enterprise sector (15.6

years in 1991 compared with 15.3 years in 1997), with this trend also being supported by a reduction in the age of the stock of machinery and equipment (8.0 years in 1991 compared with 7.6 years in 1997) and, to a somewhat lesser extent, the stock of buildings (21.2 years in 1991 compared with 21.0 years in 1997). The figures for 1994, the last year in which separate data are available for the new Länder and the old Länder, suggest that the process of restructuring east Germany's fixed assets has made good progress, with the average age of the total stock of assets being 25.3 years in eastern Germany (compared with 32.6 years in 1991) as against a corresponding figure of 21.3 years in western Germany (compared with 20.9 years in 1991).

Similar conclusions are reached by measuring what is known as the degree of modernity of the capital stock. This is the quotient of net and gross values which shows the proportion of an asset which is not yet written off. Since the straight-line method of depreciation is used for calculating the net capital stock, the degree of modernity can also be seen as a yardstick which compares the remaining useful life of the capital stock with its initial useful life. This ratio has risen constantly in the new Länder in the wake of the restructuring process, and at the end of 1993 exceeded the west German level for the first time. In the old Länder, by contrast, the degree of modernity calculated in this way has fallen continuously.

Degree of modernity

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6 The aforementioned estimates are based on the enterprise sector excluding housing and excluding agriculture and forestry.

Gross stock of fixed assets in Germany *

DM billion, at 1991 prices

Economic sector	1990	1991	1992	1993	1994	1995	1996	1997
Enterprises excluding housing	5,715	5,950	6,182	6,346	6,506	6,649	6,788	6,928
of which								
Agriculture, forestry and fishing	428	429	429	426	424	422	421	.
Production industries	2,509	2,584	2,659	2,684	2,705	2,713	2,726	.
of which								
Electricity, gas, steam and water supply, mining	732	744	762	771	786	791	799	.
Manufacturing	1,672	1,729	1,779	1,790	1,789	1,785	1,788	.
Construction	105	111	118	124	130	136	139	.
Wholesale/retail trade, transport	1,300	1,359	1,421	1,475	1,525	1,564	1,600	.
Service enterprises	1,478	1,579	1,673	1,761	1,852	1,950	2,042	.
Housing 1	5,437	5,575	5,725	5,870	6,033	6,198	6,362	6,523
Government	963	989	1,017	1,042	1,065	1,087	1,106	1,121
Private non-profit institutions	244	250	256	264	270	275	281	286
Overall economy	12,359	12,764	13,180	13,522	13,874	14,209	14,536	14,858

Source: Federal Statistical Office. — * End-of-year figures. Gross stock of fixed assets (excluding public-sector civil engineering). — 1 Including owner-occupied housing.

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Sectoral structure

On the other hand, the breakdown of the stock of fixed assets by economic sector, which given the longer useful life of buildings is also of importance for the shape of the national age pyramid, retained the same basic structure in the period under review. Around 46 % of gross fixed assets are still accounted for by the enterprise sector (excluding housing), 44 % are represented by the housing sector (including owner-occupied houses), followed at a great distance by the government (8 %)[7] and private non-profit institutions (2 %). If the enterprise sector, which is of particular interest from the point of view of production theory, is analysed more closely, certain shifts in the capital goods structure can be observed under sectoral aspects. What is striking in particular is that the services sector increased its share in industrial gross fixed assets from 26 % to around 30 % in the period from 1991 to 1997. The relative increase in the capital formation of the services sector was almost entirely at the expense of the manufacturing sector, whose proportion fell from 29 % to 26 %. However, it remains to be seen to what extent these shifts are due to the intersectoral structural change or to the increased use of asset leasing. The positions of the sectors agriculture and forestry (6 %), electricity, gas, steam and water supply, mining (12 %), construction (2 %) and wholesale/retail trade and transport (24 %) remained virtually unchanged.

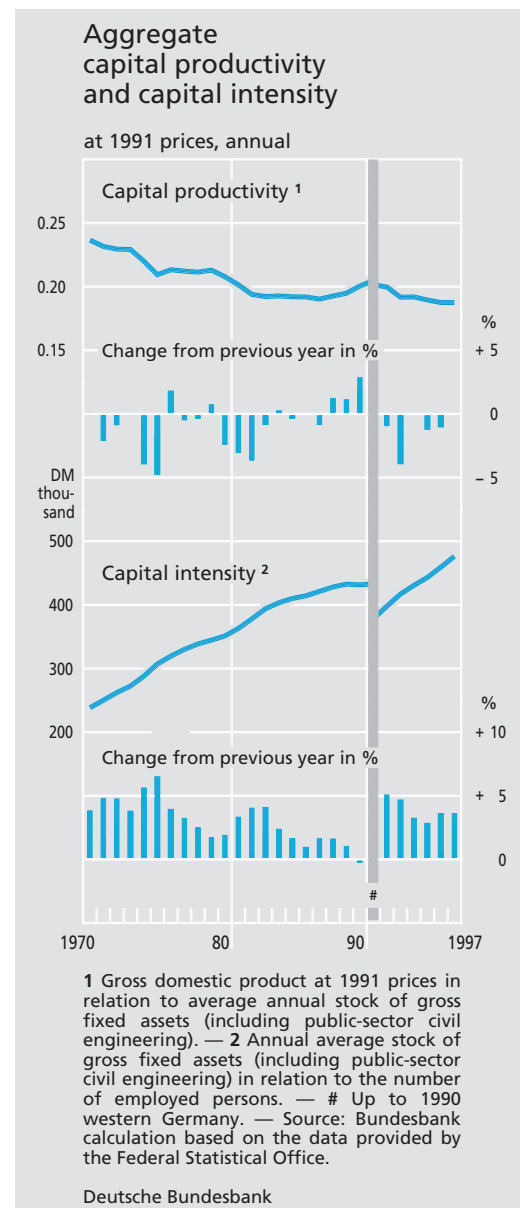7 Excluding public-sector civil engineering.

*Structure of
asset use*

The basic structure of the use of gross fixed assets by economic goods likewise shows a considerable continuity over the period under review. At 62 %, the lion's share is accounted for by buildings, with 38 % of the overall stock of gross fixed assets (excluding housing) being represented by machinery and equipment. The provision with buildings and machinery and equipment displays quite considerable differences between the individual sectors. For example, the share of machinery and equipment in total fixed assets in manufacturing is around 60 %, whereas it is only 37 % in the services sector.

*Capital prod-
uctivity*

Under growth and prosperity aspects it is not only the level of the capital stock, its sectoral use and the goods composition that are of decisive importance but also factor productivity. The statistically recorded capital productivity can be taken as a rough measure of this, although it also includes technical progress and the value-adding contributions of the other factors of production and sector-specific particularities and cyclical factors. This last factor was of considerable importance in 1991 and 1992 when, owing to the high level of capital utilisation in the wake of reunification, aggregate capital productivity reached a level which exceeded the west German average figure of the eighties by slightly over 3 %. In the following downswing the level fell distinctly.

Given the as yet comparatively brief all-German experience regarding trends and cyclical components, it remains to be seen whether the stabilisation of capital productivity at a level below the average figure of the

**Aggregate
capital productivity
and capital intensity**

at 1991 prices, annual

Capital productivity [1]

Change from previous year in %

Capital intensity [2]

Change from previous year in %

1 Gross domestic product at 1991 prices in relation to average annual stock of gross fixed assets (including public-sector civil engineering). — **2** Annual average stock of gross fixed assets (including public-sector civil engineering) in relation to the number of employed persons. — **#** Up to 1990 western Germany. — Source: Bundesbank calculation based on the data provided by the Federal Statistical Office.

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eighties observable in the statistics between 1995 and 1997 is a lasting phenomenon or even indicates a trend reversal. In this context it has to be taken into account that aggregate capital productivity is not only influenced in a complex manner by the dynamics and direction of technical and organisational innovations, but that this aggregate also reflects the microeconomic decisions on the capital intensity of production chosen in each case.

Capital intensity

The aggregate capital intensity, measured as the ratio of the capital stock at 1991 prices to the number of employed persons, fell sharply in Germany as a whole immediately after re-unification, since in the new Länder a major part of the stock of fixed assets had become obsolete with the advent of the market economy. When looking at the subsequent phase of a renewed rise in capital intensity in the years up to 1997, it is striking that the average growth rate of almost 4 % in this period was well above the corresponding rate of 2 ¼ % achieved in the old Länder in the eighties.[8] On the basis of estimates for the enterprise sector which give an average growth rate of 3.2 % for the old Länder for the period between 1991 and 1997, it has to be assumed that this is primarily a west German phenomenon. Nevertheless, the increase in capital intensity might have been more than three times as high in the new Länder as in western Germany.

This capital deepening has also to be seen against the background of huge rationalisation efforts, not least in the manufacturing sector, which resulted in a continuous decline in the number of employed persons. It has to be assumed, especially in view of the afore-mentioned estimates for the old Länder, that the rapid capital deepening is not only a natural reflection of the catching-up process in the new Länder, but also represents a continuous process towards substituting the factor labour by the factor capital. In this process, shifts in relative factor prices, i. e. an increase in the price of labour input compared with capital user costs, may have played a role. Moreover, the higher levies

burden as a result of increased contribution rates to the social security funds was probably also of importance, especially in the case of less skilled jobs.

Investment and employment

Rapid capital accumulation remains the central key to more growth and employment. Although there are still capacity reserves in the economy as a whole, the current capital stock is not sufficient to absorb the existing supply of labour. To create the necessary jobs, more corporate investment is urgently necessary. However, there is no simple rule by which such an investment requirement can be measured. The average capitalisation of an economy is not an adequate basis for gauging this, *inter alia* because it is not just a question of how much is invested but also of what investment motives and purposes of use are involved. The relative factor prices and the other conditions of production are of particular importance in determining whether the use of capital creates or destroys jobs.

In the end, corporate investment depends on favourable profit expectations. The prospects do not look bad in this respect currently. Capacity utilisation is high, costs are mostly under control and long-term interest rates have settled at an historically low level. However, the improvement in the fundamentals which

Investment as the key factor

8 This figure does not change for the period from 1991 to 1997 if the capital supply is measured not in terms of the number of employed persons but in terms of the number of man-hours worked. For the eighties, however, there is a significantly higher rate in the wake of the noticeable reduction in working times.

has now occurred must be maintained not only in the short term but also in the long run. In addition, the expected return on investment should not be overly burdened by taxes. The necessary precondition for an expansion of investment conducive to promoting employment is a reliable operating framework which supports enterprises' willingness to take risks. This operating framework includes not least a persistently high degree of price stability.