The development of productivity since 1991 can be summarised in the observation that in 1997 Sweden's business sector is capable of producing as much as in 1991 with 18 per cent fewer persons in employment.

Productivity growth is assumed to follow the normal cyclical pattern, becoming slower as both economic activity and capacity utilisation rise.

The cyclical component of productivity growth is assumed to follow the normal pattern, becoming smaller as both economic activity and capacity utilisation rise. These means that, compared with the past year, average productivity growth will be weaker in 1998 and 1999.

## PRODUCTIVITY, REAL WAGES AND UNEM PLOYMENT

Registered labour productivity growth has become markedly stronger in recent years. Since 1992 the annual rate for the total economy has averaged 2 per cent, which is twice the average for 1980-91. Changes in registered labour productivity have various causes. Increased productivity that stems from rising investment or technical improvements strengthens the potential for producing goods and services and creates resources for real wage increases at a given level of employment. Registered labour productivity can also rise, however, if falling demand for goods or excessively high wage increases lead to decreased employment and this raises the average productivity of the remaining labour force, for example because it results in more capital equipment per employee. In this case, the registered productivity growth does not represent a general improvement in potential production. It is effects of this type that, to some extent, probably lie behind the stronger registered growth of productivity in recent years.

The relationship between productivity, real wages and unemployment can be analysed with a standard model from labour market theory. ${ }^{14}$ T he model is made up of a wage-setting curve (W S), which describes a positive relationship between the real wage and total employment, and a curve for aggregated labour demand ( $D$ ), which has a negative slope. The wage-setting curve illustrates the tendency of real wages to rise with the employment rate; the reason may be, for exam-
ple, that, compared with a state of high unemployment, it is easier for employee organisations to get high wage demands accepted. The negative slope of the demand curve stems from the assumption that marginal labour productivity declines as employment rises, for instance because a given amount of capital equipment is spread over more employees. ${ }^{15}$

Equilibrium obtains at the real wage at which the wage-setting curve and the labour demand curve intersect (a in Fig. B1). The number of unemployed is obtained as the difference between the total labour force (LF) and equilibrium employment ( N ), both expressed as the number of persons. The model illustrates the notion that it is the real rather than the nominal wage that is important for unemployment.

In a normal growth process driven by technology and capital formation, both the wage-setting and the demand curve will shift upwards over time. Increased productivity leads to rising labour demand, accompa-

[^0]Figure B1.
Productivity enhanced by new technology or real capital formation

nied by employees' demands for their share of the economic growth. In Fig. B1, this is illustrated by W S shitting to $W S^{\prime}$ and $D$ shifting to $D^{\prime}$. In this example, $b$ is the new equilibrium, with total employment the same as initially and a higher real wage. Productivity improvements of this type generate a potential for increasing the real wage at a given level of employment. In Fig. B1 this potential is represented by the distance from a to b . It is important to bear in mind that the real wage increase is contingent on having increased total resources to distribute.

In practice, however, registered productivity growth does not necessarily represent an increased production potential. Suppose, for example, that the product market is hit by decreased demand. If this leads to lower product prices without any change in nominal wages, the economy will move upwards along the curve D in Fig. B2 from cto, say, $d$, where employment, $N_{1}$, is below its initial level, $\mathrm{N}_{0}$. Firms now strive to have fewer employees at the higher real wage.

Figure B2.
Registered increase in productivity from decreased employment


Given declining marginal productivity, the marginal and average productivity of labour will rise, for instance because there will be more capital equipment per employee. ${ }^{16}$ In this model, increased productivity may also be registered if, for example, the employee organisations acquire a stronger bargaining position on other grounds than higher employment. T he wagesetting curve will then shift upwards and the economy may then likewise move to $d$, with decreased employment but increased marginal and average productivity. Conversely, higher demand leads to increased product prices. If nominal wages do not rise correspondingly, the real wage will fall, leading to rising employment and declining productivity.

16 In time, given an efficient economy, nominal wages will be adjusted downwards so that the economy returns to c , accompanied by rising employment and falling marginal (and average) productivity.


[^0]:    14 See, for example, Björklund, Edin, H olmlund \& Wadensj̈̈ (1996), Arbetsmarknaden (Labour M arket), SNS Förlag. A standard reference is Layard, Nickel \& Jackman (1991), U nemployment: M acroeconomic Peformance and the Labour M arket, O xford U niversity Press.
    15 Given imperfect competition in the market for goods, which enables the firm to adjust the product price in order to cover rising production costs, for example, the labour demand curve can be interpreted as a price-setting relationship. Its slope may then also mirror a tendency for the mark-up (the difference between product price and wage costs) to rise with rising economic activity and employment.

