

## HOURS WORKED – A DECOMPOSITION

During 2001 a slackening of economic growth in Sweden was accompanied by some increase in inflation, which raises questions to do with supply-side conditions in the Swedish economy. It is conceivable, for instance, that potential growth has slackened to a greater extent than anticipated earlier.<sup>15</sup> A central factor for potential growth is the development of labour supply; the present account focuses on the number of hours worked. A decomposition of hours worked throws light on the forces that have been driving this factor in recent years. Some alternative scenarios for future developments are also presented. They illustrate the importance of a policy in the coming years that paves the way for a high growth of labour supply.

### CHANGES IN HOURS WORKED

The increase in hours worked slackened from 2.5 per cent in 1999 to about 0.5 per cent in 2001, while the number in employment rose 2.2 and 1.9 per cent, respectively. Conceivable explanations for the development of hours worked are, for example, decreased overtime and increased sick leave. One way of analysing the development of hours worked is to look at the sub-components. A decomposition can be done as follows. The number of hours worked is calculated by multiplying mean working time by the number of persons actually in work. These persons can be identified as follows. The working population consists of persons between 16 and 64 years of age. For various reasons (illness, education, family ties, personal choice, for example) not all these people are available for work. Those who have a job or are looking for one constitute the labour force and are either employed or unemployed. Instead of being at work, some of the employed are absent for various reasons (illness, child care, holidays, for example).<sup>16</sup>

15 See also the box on pp. 22–26.

16 The number of persons at work is calculated here as the number in employment less those absent for sickness, so unlike the Riksbank's forecasts, absenteeism for other reasons is disregarded here.

This decomposition gives rise by definition to the following relationship:

$$HW = Pop * part * (1-u) * (1-sick) * mwt \quad (1)$$

where  $HW$  is hours worked,  $Pop$  the population of working age (16–64 years),  $part$  the percentage of  $Pop$  that is participating in the labour force,  $u$  the percentage unemployed, sick persons absent for sickness as a percentage of the employed and  $mwt$  is mean working time.<sup>17</sup>

The percentage change in hours worked can then be approximated as:

$$\frac{\Delta HW}{HW} * 100 = \left( \frac{\Delta Pop}{Pop} + \frac{\Delta part}{part} + \frac{\Delta(1-u)}{(1-u)} + \frac{\Delta(1-sick)}{(1-sick)} + \frac{\Delta mwt}{mwt} \right) * 100 \quad (2)$$

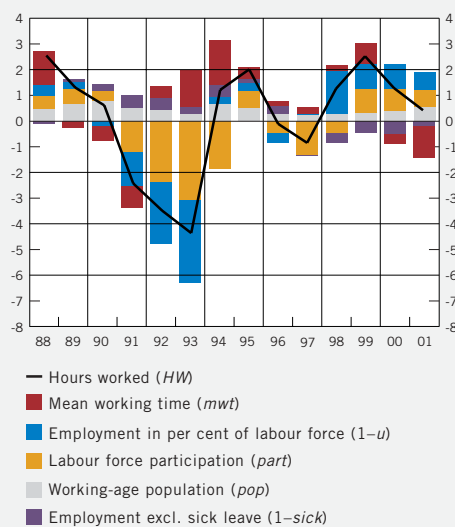
The results of such a decomposition of hours worked in the period 1987–2001 is discussed below. Note that the decomposition by itself does not tell us anything about causal connections. Each component is affected in a complex manner by both structural and cyclical factors.

#### PICTURE OF HOURS WORKED 1987-2001

The results of a decomposition are presented in Fig. B11. It will be seen from the curve that the change in hours worked fluctuated markedly over the years; the bars represent the five factors that contributed to this variation. In 1993, for example, hours worked fell more than 4 per cent and the bars show that this was the net result of a negative contribution of over 6 percentage points from decreased labour force participation and falling employment, countered by a positive contribution of about 2 percentage points from increased mean working time, decreased sick leave and population growth.

So how have the individual components developed and what are the conceivable driving forces? The *population of working age* grew continuously in the period studied here (Fig. B11); the growth was driven by demographic factors, mainly nativity, and to some extent by labour migration. While birth rates change rather slowly over time, they may be susceptible to the labour

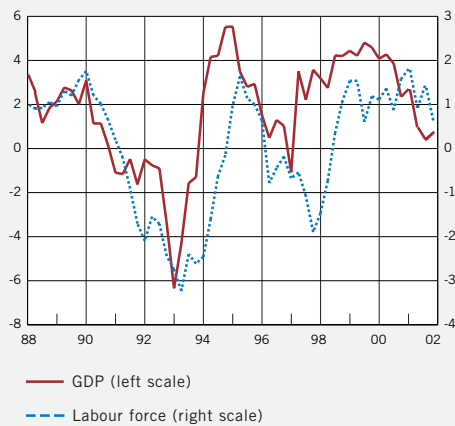
**Figure B11. Contributions to annual changes in hours worked.**  
Per cent



Sources: Labour force surveys (population, labour force, employment, sick leave and mean working time), National accounts (mean working time) and the Riksbank (calculation of hours worked).

<sup>17</sup> Mean working time is calculated here as annual hours worked (derived from the national accounts) divided by the average number in employment and not absent for personal illness (derived from the labour force surveys). The Riksbank's forecasts use the total number in employment.

**Figure B12. GDP and labour force (no. of persons). Percentage 12-month change**



Source: Statistics Sweden.

market situation, for example.<sup>18</sup> Other components may be affected by changes in the age structure of the working population. Labour force participation by both young and elderly people has generally been below the average rate, for example.

A factor of importance for *labour force participation* is the demand situation (Fig. B12), in that people may refrain from entering the labour force if they see little chance of getting a job. But labour force participation is also related to supply, being affected by, for instance, wages, taxes and work-free income (e.g. transfers), as well as by institutional changes in the educational system and labour market programmes, for example. The decreased participation in the period 1996–98 was partly connected with the government drive for education that was introduced in July 1997.<sup>19</sup>

Moreover, Fig. B11 shows that *employment* largely followed the cyclical pattern and was affected by, for example, the state of demand, the price of various production factors (e.g. wage costs) and technical developments. The level of unemployment can also have to do with a mismatch between the available jobs and those looking for work, as well as by institutional changes such as the construction of unemployment insurance. During the past two years employment has risen appreciably despite the economic slowdown and rising real wages. Underlying factors here may be labour hoarding and increased absenteeism.

*Sick leave* has tended to lower the increase in hours worked for a number of years. Studies have shown that a high level of unemployment may restrain the propensity of employees to report sick.<sup>20</sup> The reverse may apply, however, in the case of long-term illness and early

18 See e.g. *Barnafödandet i fokus – från befolkningspolitik till ett barnvänligt samhälle* (Focus on childbirth – from population policy to a child-friendly society), Ministry of Health & Social Affairs, DS 2001:57.

19 The purpose of this programme was to raise the general level of education, mainly among unemployed adults with little or no three-year upper secondary schooling. The programme initially provided an additional intake of 110,000.

20 See e.g. Lantto, K. & Lindblom, E., (1987), *Är arbetslösheten hälsosam?* (Is unemployment healthy?), *Ekonomisk Debatt* 4, and Lindwall, U. & Skogman Thoursie, P., (2000), *Sjukfrånvaron och förtidspension – En beskrivning och analys av utvecklingen de senaste decennierna*, (Sick leave and early retirement – a description and analysis of developments in recent decades), 2, National Social Insurance Board.

retirement (the latter is often preceded by the former). Those who become redundant when labour demand falls and who are to some extent incapacitated or ill are liable to be completely excluded from the labour market. A breakdown of sick leave by its duration shows that the increase in recent years has come mainly from long-term illness (Fig. B13). One explanation for this may be that the rules for qualifying for early retirement were tightened in 1997.<sup>21</sup> Another institutional explanation for the recent path of absenteeism for illness could be the replacement level in health insurance. In 1998, for example, the level was raised from 75 to 80 per cent.<sup>22</sup> Some part may also be played by other incentives connected with the interactions of unemployment insurance with sickness insurance.<sup>23</sup> There is, for instance, an increased tendency to report sick towards the end of a period of unemployment. It is also conceivable that the activity guarantee, which encroaches on an unemployed person's free time, may have contributed to increased sick leave among the unemployed. Changes in the age structure of the working population may play a part, too.<sup>24</sup>

*Mean working time*, the last component of hours worked, fluctuates markedly over time. One explanation for this may be labour hoarding; recently, for example, overtime has fallen sharply. Institutional factors may also play a part. For example, the agreed adjustment of working time to the level of activity, particularly in manufacturing, that was introduced in 1998 may have contributed to the recent slowing of mean working time. Changes in mean working time may also have to do with changes in supply. The economic literature shows that employees may choose to shorten/lengthen their working time in response to changes in wages, taxes and work-free income, for example. In practice, however, working time is relatively regulated.

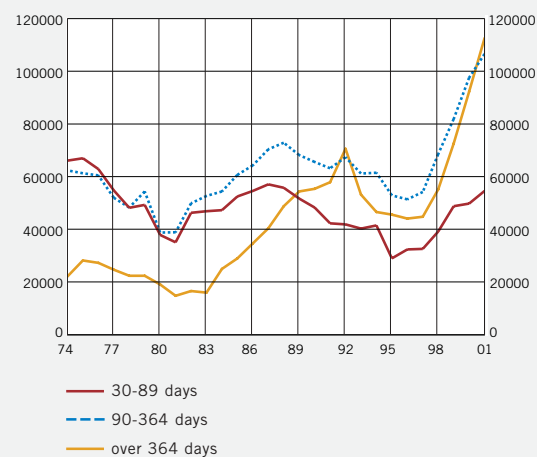
21 Lindwall, U. & Skogman Thoursie, P., (2000), *idem*.

22 See e.g. Henrekson, M. & Persson, M., (2004), The effects on sick leave of changes in the sickness insurance system, *J. of Labor Economics* 22:1.

23 See Larson, L., (2002), Sick of being unemployed? Interactions between unemployment and sickness insurance in Sweden, *IFAU Working Paper* 6.

24 Simple calculations, using the studied age groups' actual proportions of the working population while their sickness rates are held constant at the 1996 level, show that demographic changes account for little more than 6 per cent of the increase in sick leave in the period 1996–2001. When each cohort's sickness rate is held constant at the level in 2001, total sick leave rises only marginally in the forecast period. On the other hand, calculations from the Swedish Trade Union Confederation indicate that the significance of the demographic effects for sick leave is considerably greater, see Andersson, D., Löfgren, A.K. & Wennemo, I., (2002), Ge alla unga ett lånefritt högskoleår (Give all young people a loan-free college year), *Dagens Nyheter* 19 April. Thus, the results seem to depend on the choice of method as well as data.

Figure B13. Recipients of sickness benefits broken down by the duration of sick leave.



Source: National Social Insurance Board.

## ILLUSTRATIVE CALCULATIONS FOR 2002-04

The decomposition presented above can be used to illustrate conceivable future scenarios. The Inflation Report's main scenario for hours worked in the period 2002-04 is presented in Table B3 together with three illustrative alternatives. In the main scenario, a fall in hours worked this year is followed by increases in 2003 and 2004.

The first illustrative calculation shows the isolated effect on hours worked from the demographic developments forecast by Statistics Sweden. (The contributions from other factors in the decomposition are accordingly set to zero.) It will be seen from Table B3 that the expected future contribution from changes in the working population are positive; neither do they differ appreciably from earlier contributions (Fig. B11). However, the age structure of the working population could have effects on other components, for example labour force participation and sick leave.

The next illustrative calculation concerns the future development of sick leave. The main scenario assumes that the increase in sick leave ceases during the forecast period. However, the recent increase in absenteeism for illness creates uncertainty about future labour supply. Table B3 shows how hours worked may develop if sick leave were to go on rising in the forecast period.<sup>25</sup> The trend for hours worked would then be appreciably weaker than in the main scenario. Instead of rising 0.7 per cent in 2004, for example, hours worked would be unchanged. It should be noted, however, that such a strong increase in sick leave is considered to be unlikely, particularly in view of the employment forecast in the main scenario. Statistics on short-term sick leave among private employers with up to 49 employees show that sick leave in 2001 Q4 was unchanged from a year earlier, which may indicate that the inflow to sick leave has stopped rising.<sup>26</sup> However, in the same period the proportion of cases that were passed on to insurance offices (sick leave with a duration of more than 14 days) rose from 12 to 14 per cent.

25 In this calculation the number of persons on sick leave in the age groups 16-24, 25-54 and 55-64 years is projected to go on rising in the forecast period at the same average rate as in 1999-2001. As the number in employment is assumed to follow the main scenario, in this illustrative calculation the increase in the proportion on sick leave is remarkably high.

26 See *Korta sjukfrånvaron fjärde kvartalet år 2001* (Short-term sick leave 2001 Q4) (2002), Statistikinformation Is-I 3, National Social Insurance Board.