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CONCEPT, MEASUREMENT AND POLICY IMPLICATIONS OF THE NAIRU - PERSPECTIVE FROM BELGIUM

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BSTRACT/RÉSUMÉ

The use of the NAIRU-concept is not very widespread in Belgium. This may be partly due to an observed unemployment rate that is probably significantly higher than the NAIRU for most of the past two decades. Government policy to halve the administrative notion of unemployment by the beginning of the next century has therefore little regard for the NAIRU level. A second reason for the low popularity of the NAIRU resides in the fact that the measurement issues are seen as enormous. Confidence intervals for NAIRU estimates are notably high. From partial information on the last economic cycle in 1987-94, the deduction is nevertheless that the NAIRU would be in the 7-8 per cent range.

Instead of finding exact estimates for the NAIRU, the paper looks into the wage formation process in Belgium in the long and short run. Although total factor productivity is the main long-term influence of real wages, in the short term labour market pressure is clearly the main determining factor. It is argued that government intervention in the wage formation process, although widespread during the past 15 years, has been possible because of low pressure on the labour market.

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L'utilisation du concept du NAIRU n'est pas très répandue en Belgique. Ceci résulte sans doute en partie du fait que le taux de chômage observé a été la plupart du temps significativement plus élevé que le NAIRU au cours des 20 dernières années. La politique économique du gouvernement qui vise à réduire de moitié la notion administrative du chômage avant le début du siècle prochain ne s'intéresse donc que peu au niveau du NAIRU. Une seconde raison du faible intérêt suscité par le NAIRU réside dans le fait que les problèmes de mesure de cet indicateur apparaissent considérables. Les intervalles de confiance des estimations du NAIRU sont particulièrement larges. Les informations partielles que l'on peut extraire du dernier cycle économique 1987-94 suggèrent néanmoins que le NAIRU se situerait dans une fourchette de 7-8 pour cent.

Plutôt que chercher à déterminer une estimation précise du NAIRU, cette étude procède à analyse du processus de formation des salaires en Belgique à court et à long terme. Bien que la productivité totale des facteurs soit le principal facteur influençant les salaires réels à long terme, à court terme les pressions sur le marché du travail constituent clairement le facteur le plus déterminant. Cette analyse suggère que l'intervention du gouvernement sur le processus de formation des salaires, bien que très marquée durant les 15 dernières années, n'a été possible qu'en raison des faibles pressions s'exerçant sur la marché du travail.

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1. Concept, estimates and limits of the NAIRU for Belgium[1]

1. The relationship between wage or price increases and the unemployment level is important from the viewpoint of economic policy. If the unemployment rate could be reduced by fiscal or monetary policy without raising wage or price inflation, the unemployment rate would be said to be higher than the NAIRU[2]. It is therefore important to know the level of the NAIRU and its determinants. A popular way to derive the NAIRU is by estimating a Phillips-curve wage equation (like the one described below), combined with a price equation.

2. The wage equation is then supplemented by a set of "supply"-indicators that would describe the evolution of the NAIRU. Among the variables often chosen are labour force participation rates, unionisation rates, shares of specific groups in the labour force (e.g. manufacturing employment, elderly, female, etc.) replacement ratios, the wage wedge, etc. Economic policy could then concentrate on influencing these variables to bring the NAIRU down.

3. There are remarkably few studies estimating a NAIRU for Belgium. Most of the estimates are done in an international context. This may be partly due to a lack of reliable data on the "supply"-indicators for a reasonably long period in Belgium but it probably also has to do with the conviction among many economists that an econometric analysis adds relatively little to the discussion in the Belgian case. From the experience in other countries it is clear that one can come up with NAIRU-estimates that vary greatly without much altering the specification of the wage equation. Some recent estimates can be summarised as follows:

a) *Layard, Nickell, Jackman, 1991*[3]. The "Natural Rate of Unemployment" for the period 1980-88 was estimated at 7.04 per cent, the actual unemployment rate for that period was 11.07 per cent, leaving an "unemployment gap" of around 4 per cent;

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1. This paper uses research from Hertveldt, B., J. Verlinden, "Macro-economic supply side mechanisms of the Belgian economy", Federal Planning Bureau, forthcoming. The author wishes to thank the Belgian members of the OECD - Working Party No. 1 for their valuable comments on earlier drafts of the paper. The responsibility for remaining errors are, of course, his.

2. To be more precise, the concept of NAWRU (non-accelerating wage rate of unemployment) is used to describe the link between the unemployment rate and wage inflation

3. See Layard, R., S. Nickell and R. Jackman. "Employment, macro-economic performance and the labour market." Oxford University Press, 1991, p. 618.

b) *Bogaert H., T. de Biolley and Verlinden, 1991*[4]. The "Natural Rate of Unemployment" for 1990 was estimated at 5 per cent, the observed unemployment rate was 10.3 per cent (using national definitions), resulting in an "unemployment gap" of over 5 per cent;

c) *OECD (Giorno C., P. Richardson, R. Roseveare and Van den Noord), 1995*[5]. The NAWRU for 1990 is estimated at 10.8 per cent while the actual unemployment rate (OECD standardised definition) was 8.7 per cent. For 1993, the NAWRU-estimate remained constant at 10.8 per cent while the actual unemployment rate increased to 11.9 per cent. The "unemployment gap" for 1990 is then estimated at -2.1 per cent;

d) *European Commission, 1995*[6]. The NAIRU is estimated at 6.4 per cent for 1990 (9.1 per cent for 1993) while the observed unemployment rate is 8.4 per cent for 1990 (10.6 per cent for 1993). Confidence intervals are given and are generally large (the limits of the confidence interval for 1993 are 3.1 per cent and 28.5 per cent). For 1990 the "unemployment gap" is estimated at 2 per cent;

e) *Lessons from the economic cycle 1987-94.* An alternative approach is to look at what happened in the most recent, rather well-defined economic cycle between 1987 and 1994. Between the middle of 1987 and the beginning of 1991, the unemployment rate dropped 3.5 per cent points. During the next three-and-half years, the unemployment rate increased again 3.5 per cent points. Some conclusions can be drawn from this seven-year cycle in the unemployment rate.

4. Economic activity was low and the unemployment rate was very high in 1987 (over 10 per cent using a standardised Eurostat-definition). During the course of that year, the economy started picking up and the unemployment rate dropped. Domestic prices increased somewhat, the CPI-index grew from around 1.5 per cent in 1986-88 to 3.5 per cent in the period 1989-91. In the early stages this was due to higher *import* prices but a subsequent drop in the *import* prices, however, did not lead to lower consumption prices. Higher CPI prices were therefore due to higher growth rates in the *domestic* component of consumption prices. Due to the price indexation mechanism of wages, nominal wages started to increase from the beginning of 1989. By then the unemployment rate had dropped to around 8 per cent. A further drop of this rate occurred during 1989 and 1990 so that the unemployment rate reached a low level of 6.6 per cent. Higher growth rates of real unit labour costs (i.e. the growth of real wages over labour productivity) were not observed before 1990 and reached a maximum in 1991 (see Chart 1).

5. From this partial information, it looks as if the following sequence of events took place: first, unemployment dropped from 1987 onwards. Second, domestic prices started increasing relatively early in the cycle (from the second half of 1988 onwards) and consequently also nominal wages. Third, real unit labour costs only picked up about two years (from 1990 onwards) after the beginning of the cycle. From this, one can deduce that the NAIRU would be in the 7-8 per cent range (using a standardised Eurostat-definition) in the early 90s.

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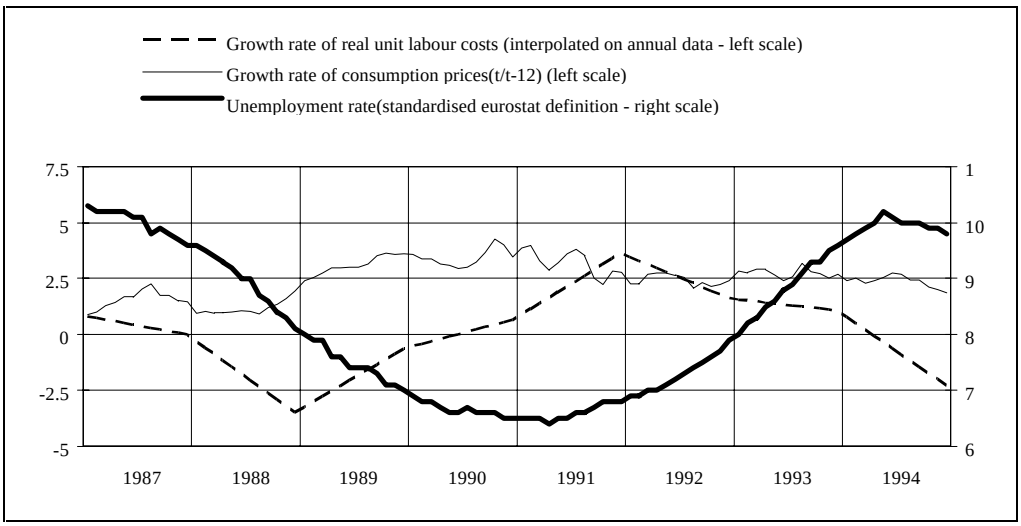
4. See Bogaert, H., T. De Biolley and J. Verlinden. *"L'ajustement des salaires face aux chocs pétroliers et les réponses de la politique économique." Planning Paper No.* 53, August, 1991.

5. See Giorno C., P. Richardson, D. Roseveare and P. Van den Noord. "Estimating potential output, output gaps and structrural budget balances." *Economics Department Working Papers No*. 152, OECD, 1995, Paris.

6. European Commission. "The composition of unemployment from an economic perspective." Technical note from the Commission services, January, 1995.

Chart 1. **Inflation, real wages and the unemployment rate in 1987-94, monthly figures**



6. The upturn in the cycle coincided, however, with the beginning of "free" wage negotiations (1987-1992)[7]. It is therefore difficult to say whether the real wage increases in 1990-92 are either the result of a catching-up process or of the low unemployment level.

7. To summarise, the studies by Layard *et al.*, Bogaert *et al*. and the European Commission give positive "unemployment gaps" (by about 2 per cent) even in the peak of an economic cycle (e.g. at the end of 1990). The OECD and the former partial analysis find a negative "unemployment gap" of about 2 per cent. It is clear that in the trough of a cycle (e.g. at the end of 1995), the actual unemployment rate is several percentage points higher than the NAIRU. The immediate risk of wage inflation is therefore probably very small. A discussion on the NAIRU is therefore absent in the context of reducing unemployment. Moreover, the Federal Government's intentions to reduce the (administrative definition of the) unemployment rate significantly have been combined with the setting up of a wage formation process that limits the increase of real wages (see Section 3 for a description of the Framework Law).

8. To get a better understanding of the wage formation process in Belgium, an overview of the institutional aspects of the process are described, as well as an analysis of its main determinants.

7. See Section 3 for a description of government intervention in the wage formation process.

2. Institutional setting of the wage formation process

2.1. The traditional system

9. Wage formation in Belgium is generally considered as one of the central parts of the social interrelations in the country. To some extent the wage formation process is rather different from those which exist in many other European countries.

10. The principles of the wage formation process and social relations in general were set out at the end of World War II. The Law of 5 December 1968 is generally considered as the corner-stone of social relations in Belgium. This Law lays down that the actors in the system are limited to be employers or employees, represented by their recognised institutions. Only these recognised institutions can conclude agreements. These actors are the so-called "Social partners". On the employers side they are: VBO/FEB and NCMV/UCM and on the employees side: the "Christian" union (ACV/CSC), the "socialist" union (ABVV/FGTB) and the "liberal" union (ACLVB/CGSLB). The main employer and employee organisations have affiliated federations. These affiliated federations are also recognised by the Law to conclude agreements.

11. The main principle of the 1968 Law is a wage formation process in three steps. In the first step, *national interprofessional agreements* are concluded between the recognised institutions. This is done in the National Employment Council (NAR/CNT) and the Central Economic Council (CRB/CCE). From 1960 onwards, agreements were made every three years while from 1969 every two years (seven agreements were signed between 1960 and 1975). These agreements set the general framework that had to be followed in the next steps. The contents of the agreements were concerned mainly with the number of holidays, the working time, the minimum-wage, etc. These national interprofessional agreements resulted, among other things, in a decrease of inter-sectorial differences.

12. In a second step, *agreements at industry level* are settled between the legal representatives of the sectorial groups within the so-called Parity Committees (the name "Parity" refers to the composition of the Committee: the legal representations of employees and employers, presided by a civil servant from the Ministry of Employment and Labour). About 130 of these Committees exist and around 500 agreements are yearly made. These agreements take the general framework of the interprofessional agreements into account, concluded in the first step, but are much more specific in the area of wage formation. In a third step, finally, *agreements on company-level* are decided.

13. Looking at the *extent of centralisation* of the wage bargaining process from an international perspective, the Belgian system is generally considered to be in the middle between highly centralised (as e.g. in the Scandinavian countries) and highly decentralised (as e.g. in the US or Canada) wage formation processes. Calmfors and Drifill (1988) rank 17 OECD-countries according to centralisation (which they define as "the extent of inter-union and inter-employer co-operation in wage bargaining with the other side"). Starting from the most centralised wage bargaining system, Belgium occupies the eighth place, Germany, the sixth, the Netherlands the seventh and France the 11th.

2.2. Some recent evolutions and appreciation

14. The main aim of the wage agreements for a long time has been improving the conditions of the working population. The unions aimed to increase wages and to improve the working conditions of actual workers while the people who are not involved in the bargaining process, i.e. the unemployed, were never

directly involved in the bargaining system (see the "insider-outsider" problem). This system worked well up to the mid 70s when economic growth was high and unemployment low. The system, however, seemed inadequately adapted to absorb the supply shocks that led to strong increases in the unemployment rate[8], and this led to the Government started intervening. The *aim* and the *contents* of the agreements of the wage formation process has in this way gradually moved from *working conditions* towards *employment*. One of the items in the Global plan (*global plan/plan global*) defines a "health index" and, is in this way, a considerable step in the direction of enabling the system to absorb possible future oil price shocks.

15. Although the institutional settings described above continue to exist and function today, it cannot be denied that the Government intervened to such an extent in the wage formation process over the past 15 years that one may wonder if the main power in wage setting has not moved from the *traditional* system to a *wage-setting* or a *wage-influencing* system by the Federal Government. One of the main ways the Government has intervened is in the area of the well-known system of automatic price indexation of wages. While this system still holds, several interventions (among them "index-jumps", re-definitions of the price-index and the creation of the "health-index") have been made in the past. At several occasions in recent years [most notably in the autumn of 1993 (Social Pact and later Global plan) and in the Autumn of 1996] the Social partners have not been able to agree on common proposals leading to decisions by the Federal Government concerning the framework of wage setting.

16. The existing wage-bargaining process has gradually given more power to the Parity Committees to conclude agreements that differ according to *sector* or *industry*, so that sectors with high productivity growth rates have been able to allow higher wage increases than other sectors. In this way the existing system has helped to make structural adjustments to the economy.

17. Two other areas, however, need to be mentioned here: dispersion of wages among different wage levels and regional discrepancies within Belgium.

18. Wage dispersion is defined as the distribution of wages over different groups of employees. Chart 2 shows two measures of wage dispersion: on the left side, the wage level in the highest decile (D9) compared to the median wage (D5) and on the right side, the median wage compared to the wage level of the lowest decile (D1). Apart from the Scandinavian countries, Belgium's wage dispersion is one of the lowest, i.e. differences from the median wage are relatively small. This is very desirable from an equity point of view in terms of income distribution but not necessarily in terms of employment opportunity[9]. Moreover, the incentive to climb the wage ladder might become less attractive, especially if low wage dispersion is accompanied with high marginal tax rates and (relatively) high replacement rates. On the other hand, a recent OECD study found that *job mobility* between quintiles was not higher in the United States (generally considered as a country with a less regulated labour market) than in some European countries[10].

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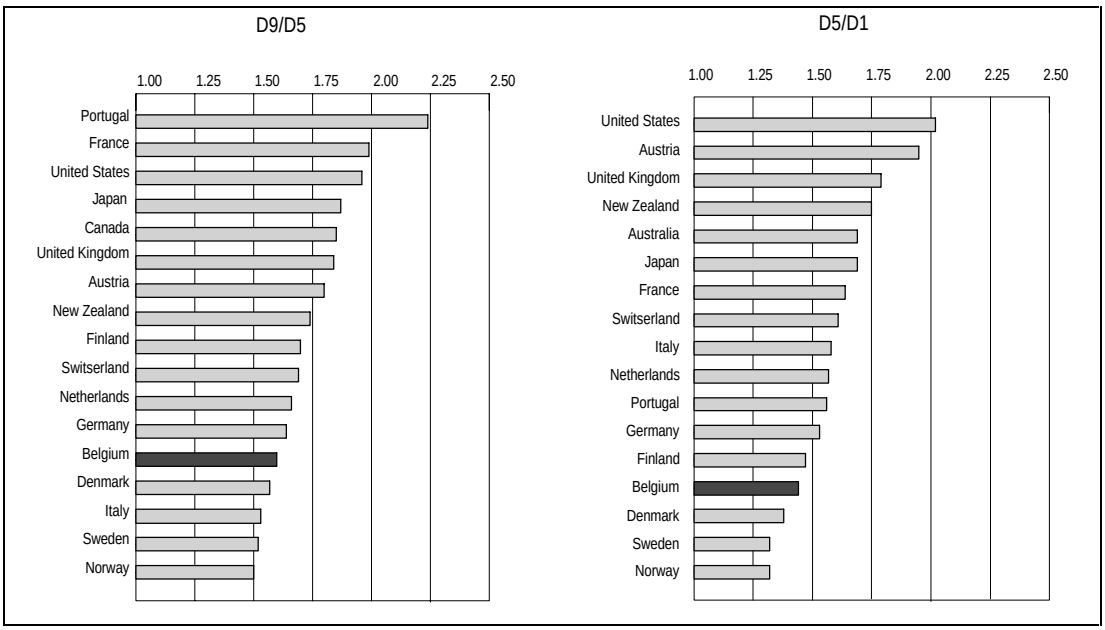
8. See Bogaert, H., T. De Biolley and J. Verlinden. *"L'ajustement des salaires face aux chocs pétroliers et les réponses de la politique économique." Planning Paper No.* 53, August, 1991.

9. Figures in the table refer to gross wages per full-time employed person, so that the tax and transfer-system make the system even more equitable.

10. See OECD (1996). "The distribution of earnings in selected OECD-countries, Annex 4 Earnings mobility." Working Party 1, October.

Chart 2**. Wage dispersion in the OECD**



1. Figures refer to 1990, except for Italy, Norway, Portugal and the US, where 1991 figures are used. Wages refer to both men and women , except for the US, where they refer only to men.

Source: OCDE (1996), Perspective de l'emploi, Paris.

19. Partly linked to wage dispersion is the extent of centralisation of the wage formation. The wage formation process is to a large extent a federal matter. Only some Parity Committees exist on a regional basis. Therefore, regional differences are not taken into account in the wage formation process.

20. In an appreciation of the wage formation process in Belgium, mention has to be made of the positive elements. Among the positive elements, the fact that the purchasing power of wages was kept through a generalised indexation system, which led to a considerable "peace"-dividend, was probably the most important. The number of days lost in industrial disputes is very small in a European comparison[11]. The wage dispersion among employees is low which leads to social cohesion and more equity. Structural adjustment was made possible through the growing influence of the Parity Committees which operate on a sectorial level. Also, the present price indexation mechanism allows supply shocks coming from higher oil prices to be better absorbed.

21. On the negative side, mention has to be made of the "insider-outsider" problem which led to high wage increases and low employment growth. The system is also not sufficiently adapted to absorb regional differences. And finally, as has been mentioned earlier, the negative side of a low wage dispersion is unattractiveness to rise in higher wage deciles.

11. This number was estimated to be 24 days per 1 000 employees in 1991 in Belgium and 104 days in the E.U. This number was only smaller in Germany (6), the Netherlands (14) and Luxemburg (3) *Source*: Eurostat. "Work organization and working hours 1983-92". Luxemburg, 1995.

3. Main factors influencing wage formation

After having looked at the positive and negative sides of the institutional settings of the Belgian wage formation process, a list of the main factors influencing wages over the past 40 years is given.

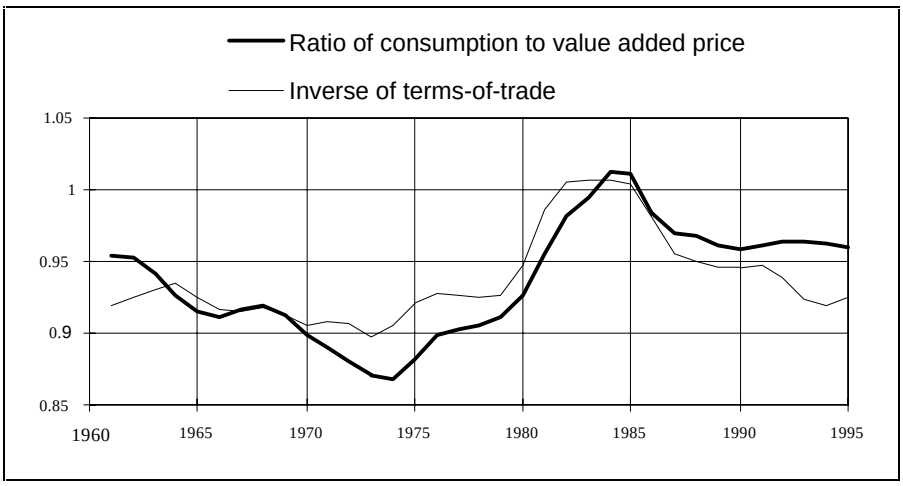
3.1 Price indexation

22. Since 1947 wages have been linked to prices through an institutionalised and generalised indexation system. Every sector -- or more precisely, every Parity Committee -- has its own system of indexation[12]. In general, however, two systems can be distinguished -- although a mix of the two systems also exists: a system with indexation of wages at pre-determined times and a system with indexation of wages with pre-determined fixed growth rates. Price indexation in the banking and the construction sector are examples of the first system (indexation every two months in the banking sector, every three months in the construction sector). Whatever the system, however, the consumption price index (CPI) is always used as the guideline to adjust the wage to the cost of living. The Government decided that a "smoothed" index (average of CPI over past four months) had to be used since 1984. Since 1994, a "health" index is introduced which is (see supra) equal to the CPI with the exception that some products are excluded (oil products, tobacco, alcohol and cigarettes). Although these corrections matter, far more important is the fact that *consumption prices* are used to index wages rather than another price index. From the perspective of the wage earner, an immediate and full price indexation with the CPI protects the purchasing power of his wage.

23. From the perspective of the employer, however, a combination of a generalised CPI indexation system with a stronger increase in the consumption price than the value added price, leads to a drop in business profitability unless other adjustments are made (e.g. drop in employment). In a macro-economic context, variations in the terms-of-trade explain the major differences between the CPI and the value added price and explain also some major movements in the wage share (see par. for more detail on this). The terms-of-trade shocks caused by the oil shocks in 1973, 1979 and 1986 have led to strong variations of the wage share and of the ratio of consumer to value added prices (see Chart 3). The introduction of the "health"-index led to a better protection of the wage share evolution from terms-of-trade shocks as rises in oil prices will only have a limited effect on wages.

12. Price indexation of the gross wage rate is the general rule. Certain parts, however, of the gross wage rate are not indexed.

Chart 3. **Terms of trade and relative prices**



24. Although the Belgian indexation mechanism might be exceptional in an international context, estimated wage equations for different countries are nearly all homogenous in price inflation [Coe[13] (1985) e.g. showed that the estimated price elasticity in the wage equations for the 11 countries in his sample were insignificantly different from unity]. In the short run, however, the coefficient in the Belgian wage equation is close to one, while it may be considerably lower in other countries. Also, price expectations do not play any role in wage bargaining, as the price indexation is solely based on observed price increases.

3.2. Wage intervention by the Government

25. Intervention in the wage formation process by the Federal Government did not happen in any significant way up to 1975. From 1976 onwards, the extent of the intervention, however, has constantly increased (with the exception for the period 1987-1992 when wages were, to some degree, freed again). Although intervention started in 1976, 1982, the year of the devaluation, has generally been considered as a break with the past since the Government started intervening directly during that year.

26. Three reasons for the Government interventions can be mentioned: the competitive position of the business sector had to be improved; private employment had to be increased and the public deficit had to be reduced. Because the two oil-shocks in the 70s led to a worsening of the competitive position of Belgian companies, an improvement of this position was the *prime* reason for the interventions in the earlier years. Later, the two other reasons became equally important. The major decisions can be chronologically summarised as follows:

- Law of Recovery of 1976 *(Herstelwet / Loi de redressement économique)*: the Government urges the Social partners to limit real wage increases and decides to: i) suspend from April to December 1976 the price indexation of wages of that part of wages above 40250 BEF (gross monthly wage) and ii) to create a Solidarity fund in which the employee deposits half of the wage increases (and an equal sum by the employer);

13. See Coe, D.T. "Nominal wages, the NAIRU and wage flexibility." *OECD Economic Studies*, No. 5, 1985.

- Law of Recovery of 1981: real (before indexation) wage freeze in 1981 and 1982 is decided;

- 29 June 1981: "Maribel" is introduced: employers" contributions to Social security for manual workers is reduced, budgetary compensated by an increase in VAT. The industrial sector gains from "Maribel" as manual workers form a large part of their work force, but due to price increases (linked to higher VAT-rates), wages rise again so that the macro-economic impact remains small;

- 22 February 1982: the BEF is devalued by 8.5 per cent after 40 years of stability. A number of important accompanying measures lead to wage moderation: (i) a nominal wage freeze from February to May 1982 and (ii) a limitation of price indexation from June to December 1982 through nominal wage increases by fixed amounts. Later on, these measures are several times repeated resulting in nearly frozen up to December 1986;

- 1 October 1982: no ceiling will be applied in the calculation of Social security contributions. This leads to higher contributions for most wage earners. In 1982-83, employees contributions to social security are further increased;

- 30 December 1982: price indexation is calculated on the basis of a "smoothed" price index from 1983 on, resulting in delayed price indexation;

- 30 March 1984: the first 2 per cent price indexation of wages in 1984, 1985 and 1986 are transferred from wage earners to Social security (these are the so-called "index-jumps" *(indexsprongen / sauts d'index)*)[14]. This results in a drop in the take-home pay but in a stable wage cost (employers rate of contributions is increased to the same extent as the cut in the real gross wage). Bogaert *et al* (1991 op cit.) estimated that the cumulated effect of the index-jumps, the introduction of a "smoothed" index and the accompanying measures to the devaluation led to a reduction of the wage cost by 6.7 per cent from 1982 to 1987 while the gross wage was reduced by 12 per cent from 1982 to 1988;

- 1987-1992: three new interprofessional agreements are signed (1986, 1988 and 1990) but strong limits are set by the Government through the possibility of the Government to intervene if it considers that wages increase too fast;

- 6 January 1989: Competivity Law *(Wet tot vrijwaring van ´s lands concurrentievermogen / Loi de sauvegarde de la compétitivité du pays)*. The Law stipulates that the competitive position of the country is threatened if at least two of the following indicators show a worsening of the situation compared to 1987: an indicator of export performance and at least one other indicator from a list of four, the main one probably being the wage cost per employee in the private sector. The National Economic Council submits twice a year a report to the Government and the Federal Parliament indicating the evolution of these indicators compared to five (Germany, France, the Netherlands, Italy and the United Kingdom) or seven countries (five plus the United States and Japan). The Social partners are expected to take this information into account when wages are set. Furthermore, the Law foresees that the Government can intervene if it considers that the Social partners have not done enough to re-establish the competitive position of the country. In

14. In the National Accounts, the "index jumps" appear as an increase in employer's contributions to Social security while gross wages paid to employees remain unchanged.

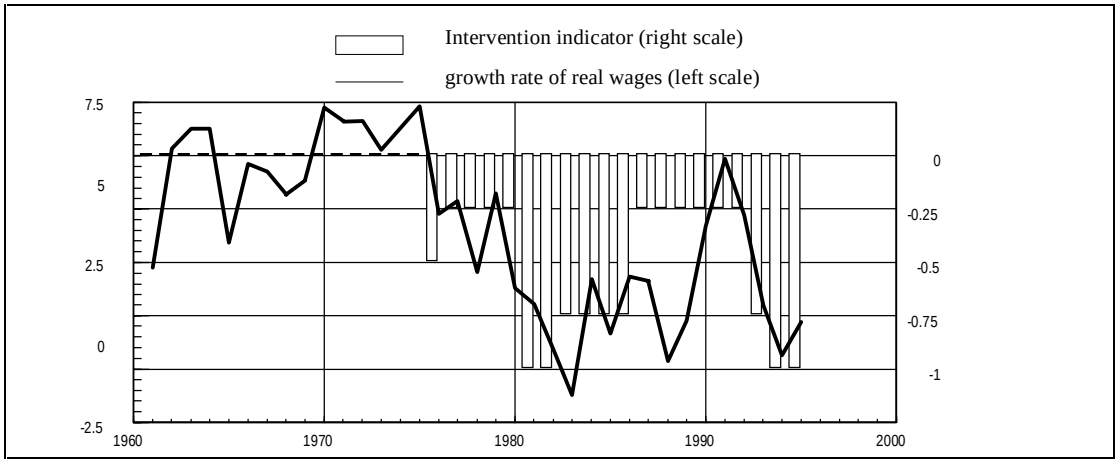
application of the Law, the Social partners agreed in 1993 that the competitive position of the country had deteriorated;

- November 1993: Global Plan: the price-index taken into account to index wages is redefined: prices of petroleum products, cigarettes, alcohol and tobacco are excluded. New increases in these prices will have no direct impact on wages. In addition, the new index has a lower level than the traditionally used index, so that indexation of wages is delayed for a few months. Also part of the Global Plan is a reduction of employers contributions to social security for low-skilled workers leading to a 10 per cent-reduction of the wage cost for minimum-wage earners. Other reductions in employer's contributions are used as an incentive for employers to hire people. Finally, a real-wage freeze for 1995 and 1996 is decided;

- 26 July 1996: Framework Law on promotion of employment and maintaining competitiveness *(Kaderwet ter bevordering van de werkgelegenheid en de preventieve vrijwaring van het concurrentievermogen / Loi cadre relative à la promotion de l'emploi et à la sauvegarde de la compétitivité)*: a minimum and maximum threshold is imposed for wage increases. The Social partners negotiate how the margin (i.e. the difference between the maximum and the minimum) will be used. The minimum is determined by the sum of indexation and increases in line with pay scales (linked to seniority, promotion, etc. -- called the wage drift). The maximum is defined by the weighted average growth of nominal wages in Germany, France and the Netherlands. The rates of increase allowed are established in national currency and concern the wage per employee in the private sector, corrected for the proportion of part-time work and for the contractually-agreed period of working time. At the enterprise-level, higher wages can be offered in the form of profit shares.

27. Taking all these measures into account, one can try to quantify the degree of wage intervention by the government for each year. One such attempt is given in Chart 4. Values between 0 and 1 are given to distinguish the extent of government intervention. An index of 0 is given for no intervention; 0.25 for limited intervention (e.g. the government does not intervene but has the possibility to do so); 0.50 for a clear intervention for part of the year; 0.75 for clear intervention without setting the wage and 1 for wage setting. To relate this indicator from the observed evolution of real wages, (where the intervention indicator is given with a negative sign to ease comparability) both indicators are shown in the same graph. It is clear that government intervention coincided with lower real wage increases (nominal wage cost deflated by private consumption price).

Chart 4. **Government intervention and real wage increases**



3.3. Productivity

28. In the long run, the wage share is relatively constant. Real wages (nominal wages deflated by the value added price), therefore, move in line with observed labour productivity. In the past 35 years, both the real wage and labour productivity (both per hour) increased on average by 4 per cent. Therefore the following long run relationship holds:

$$(w-p) = (y-l)$$

with small letters indicating logarithms, with *w, p, y, l* being respectively the nominal wage cost rate in the business sector, the value added price of the business sector, value added at factor cost in constant prices and employment in the business sector in full-time equivalents.

29. This long-run relationship is a reflection of the allocation of labour productivity gains to labour and capital in constant proportions. On the other hand from a Cobb-Douglas production function and assuming cost-minimising behaviour of producers, labour productivity can be written as:

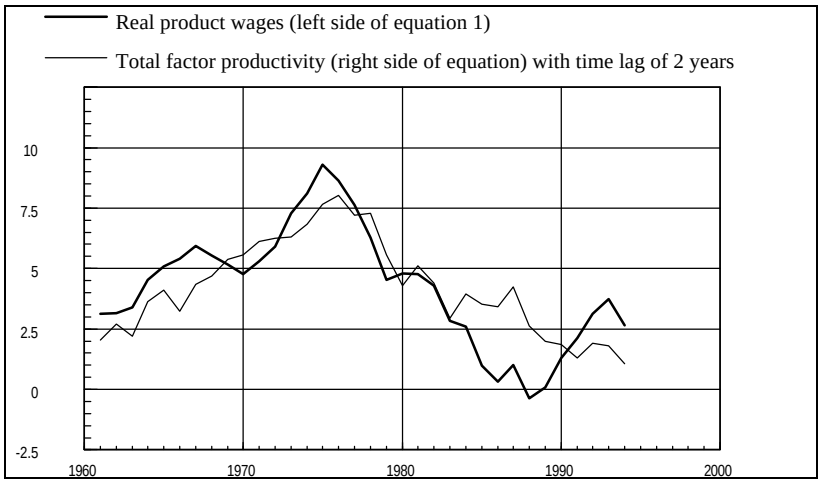
$$(y-l) = (1-\alpha)\,.\,(w-p) + tfp$$

where α is the wage share, and *tfp* stands for the growth rate of total factor productivity. Combining these two equations and assuming that $(r = p)$, i.e. that the user cost of capital evolves as the production cost, leads to the following long-term relationship:

$$(w-p) = \frac{1}{(1-\alpha)}.tfp \qquad [1]$$

30. Chart 5 shows the left and right sides of equation 1. Not only does a long-run relationship seem well established but the medium-term movements are also captured. The fact that the cycle of real wage evolution is most clearly linked to the cycle in total factor productivity with a two or three-year time lag is perhaps no surprise. Productivity gains are distributed *after* they have been observed. As mentioned earlier, the interprofessional agreements between 1960 and 1975 were first made for three years, later for two years.

Chart 5. **Real product wages and total factor productivity in enterprises**
(average annual growth rate over four years)



31. The period of government intervention (1982-95) is less well captured. The fact that real wages grow faster than productivity during the period of relative freedom (1987-1992) might be explained by a catching-up process due to the symmetrical evolution (real wage moderation *vis-à-vis* total factor productivity) observed during the 80s. Other factors apart from the catching-up might also have played an important role, as will be seen later on.

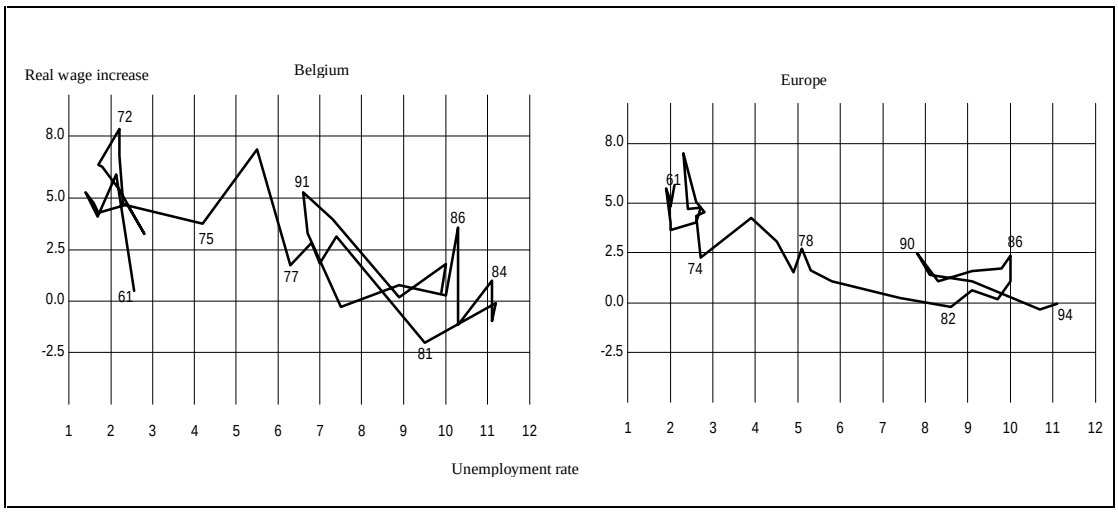
3.4. Labour market tensions

32. In the classical model, wages are seen as the equilibrating price in the labour market. Unemployment, therefore, can only exist a temporary disequilibrium in the labour market. A disequilibrium in the labour market will be absorbed through wage cuts. The reality is, of course, more complex. As has been mentioned earlier, the insider-outsider problem was clearly present in the subsequent years after the first oil shock.

33. Nevertheless, no one can deny the influence of labour market pressure on real wages. Low unemployment rates give the employed the possibility to demand higher wages because they have the possibility to change jobs. On the contrary, high unemployment puts employers in an easy position to offer job-seekers lower wages, leading to lower average wages.

34. Since wages are fully indexed in Belgium (i.e. *nominal* wage flexibility is absent), the influence of labour market tensions measures the extent of real wage flexibility (i.e. the responsiveness of *real* wages to the situation on the labour market). This extent is often measured by the "expectations-augmented" Phillips curve, describing the trade-off between real wages and an indicator of labour market tension, usually the unemployment rate. Real wage increases should become smaller the higher the unemployment rate. Chart 6 shows this relationship for Belgium and Europe. The "trade-off" between real wage increases and unemployment is not very clear: both in Belgium and in Europe real wage increases have come down since the second half of the 70s while the unemployment rate has increased.

Chart 6. **The Phillips curve in Belgium and Europe**



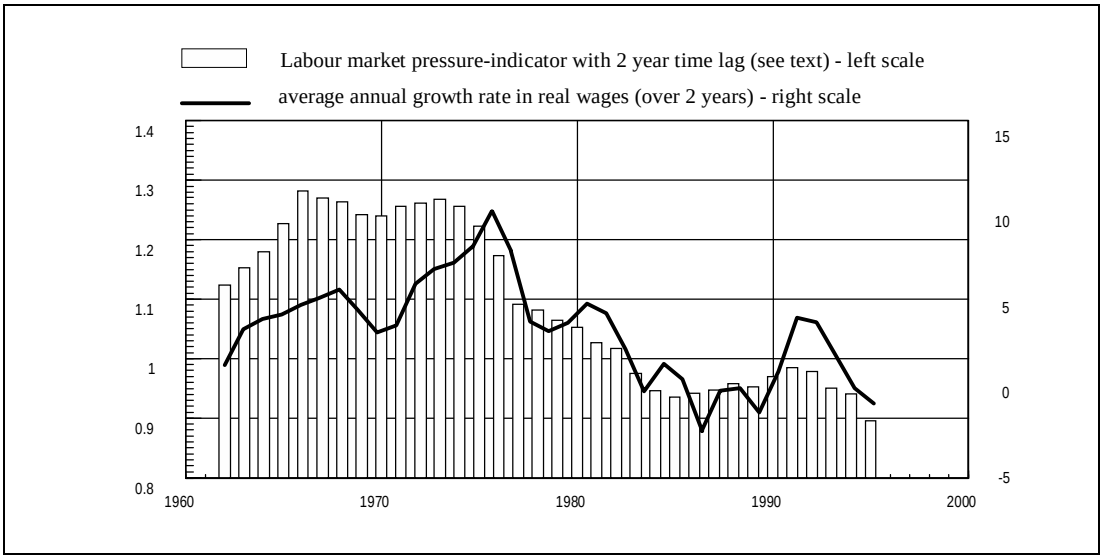
35. The unemployment rate, however, is likely to be a rather poor indicator of labour market pressure in the private sector because it does not necessarily reflect labour supply. This is so for a number of reasons. First of all, observed unemployment is an administrative notion, dependent on administrative rules. One person may be in or out of the unemployment category because of administrative procedures that have no link with the labour market condition. Secondly, unemployment is a concept for the economy as a whole and does not necessarily reflect the prevailing situation for enterprises. Therefore, it will be assumed in the indicator that will be proposed that self-employed people or those employed by public authorities (*Lexo)* are not available for employment in enterprises. Thirdly, (at least some of) the part-time employed *(Part)* do not offer their services for that part that they do not work and so have no impact on wage-formation. Finally, the unemployment rate is calculated on the basis of the observed labour force, which itself is probably not independent from economic activity, as has been shown in paragraph A. Therefore, the labour force *NAT* is calculated using trend activity rates. Also the influence of long term unemployed (those unemployed for more than two years, *UL)* on wage formation is probably limited.

36. For these reasons, instead of using the unemployment rate as a proxy for labour market pressure, an employment rate for enterprises is proposed with the following definition:

$$\frac{L}{(NAT - UL - Lexo - Part)}$$

37. Chart 7 shows the relation between real wage increases (using the value added price to deflate) and the proxy for labour market pressure, lagged with two years.

Chart 7. **Real wages and labour market pressure in enterprises**



Real wages grew strongly up to 1974 while the labour market pressure was high. From 1975 up to 1985, the real wage increases slowed down with labour market pressure declining. The employment rate increased again while real wages grew at the end of the 80s and beginning of the 90s. A two-year time lag seems to exist between the observance of labour market pressure and the real wage increases, indicating that the latter may be caused by the former.

38. Hysteresis (i.e. the extent to which a *change* in labour market pressure exerts a change in real wages) is often mentioned as an important determinant for high unemployment in Europe. From Belgian data, using the above defined labour market pressure indicator, hysteresis does not seem to add explanatory power to the wage equation (see infra) using yearly data from 1960 onwards.

39. Labour market flexibility is often measured by the *extent* to which real wages are influenced by labour market conditions. Regression of real wages on the labour market pressure indicator over several sub-periods indicates that this coefficient has increased in the past 15 years which could indicate that the labour market became more flexible.

3.5. The wage wedge

40. The relevant wage is different from an employers or employees' perspective. As has been mentioned earlier, the *consumption price* is the relevant price for employees, as wage earners are interested in their purchasing power, while the *value added price* is relevant for employers, as this is the price of their production.

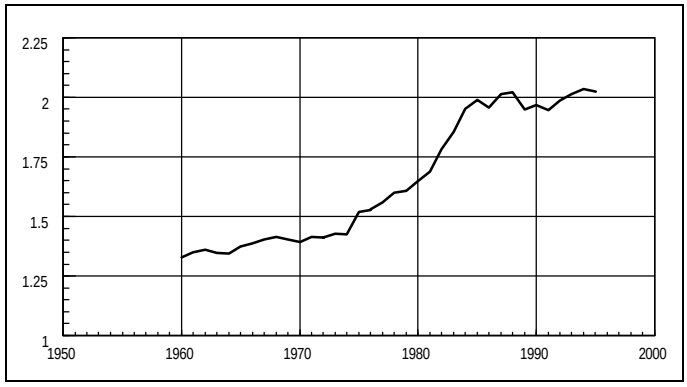
41. There is a comparable difference in interest on the nominal side. Employers are interested in the *labour cost*, i.e. inclusive of all costs and charges, while employees try to maximise their *take-home pay*, i.e. exclusive of social security contributions and direct taxes on wages. The ratio of the real labour cost of the firm to the real post-tax consumption wage of the employee is called the wage wedge. The wage wedge, Ω, can be formalised as:

$$\Omega = \frac{w}{w.(1-t_1).(1-t_2).(1-t_3)}.(\frac{p_c}{p_a})$$

with w the labour cost rate, t_1 and t_2 respectively employers and employees contributions to social security and t_3 the direct tax rate[15]. P_c/P_a is the ratio of the consumption to value added price.

42. The wage wedge has increased from the early 60s to the late 80s. This implies that employers had to pay continually higher wages for a similar take-home pay. The fiscal reform of 1987 and the reductions of social security payments by employers in 1994-95 have reduced the wage wedge somewhat but the most recent wedge is still the highest since the early 50s, indicating that the (para)fiscal pressure on labour income has never been higher (see Chart 8).

Chart 8. **The wage wedge for employees in enterprises in Belgium 1960-95**



43. The question whether the employee or the employer pays the price of an increase in the (para)fiscal pressure on labour income is difficult to answer. There seems to be empirical evidence that the real product wage increases with a higher wage wedge. It is not clear, however, if this is either a temporary or a lasting effect. With respect to the Belgian data at hand, it is difficult to obtain such an effect by estimating wage equations. The effects of fiscal and para-fiscal contributions are also probably not the same.

44. In the wage equation estimated below (Equation 2) the hypothesis is used that employers' contributions to social security have a full and immediate impact on the wage cost without affecting the take-home pay. Direct taxation and employees' contributions, on the other hand, influence the take-home pay without affecting the wage cost. Consequently, the wage rate used in the wage equation is the gross wage, i.e. exclusive of employers contributions. Although this has been a rather standard practice in Belgium, it is not based on much research.

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15. Direct tax on labour income in enterprises is calculated as a *proportion* of direct taxes on employees. Direct taxes on employees is calculated using the rates given in Valenduc, C. "*Imposition des revenus, des facteurs de production et de la consommation en Belgique", Documentatieblad - Ministerie van Financiën,* December 1996 for the period 1980-94. For the period before 1980 a constant rate of 75 per cent is applied. The *proportion* is the ratio of gross wages of employees in enterprises to the sum of gross wages earned by employees in enterprises, the government sector and domestic services.

3.6. Estimating a wage equation

45. There is a large consensus that the five above mentioned factors influence wage formation in Belgium to some degree or another. In the long-term, gross wages are fully indexed by the value added price and the real wage rate is linked to total factor productivity through the equation compatible with a Cobb-Douglas production function:

$$(w - p) = \frac{1}{(1-\alpha)}.tfp$$

In the short run variations in the nominal wage rate are explained by two factors: i) the consumption price with a possibility that indexation is not complete the first year; and ii) the labour market pressure.

46. The (quantified) government intervention indicator mentioned above does not enter the equation as it does not add any explanatory power to the equation. This could be interpreted as that government intervention in the past has been possible because the labour market situation allowed it. As can be seen from Graphs 4 and 7 the labour market pressure indicator and the government intervention indicator are strongly correlated. As the Government probably intervened in the wage formation process *following* a deterioration of the labour market, only the pressure indicator is used in the estimated equation.

47. The labour market pressure indicator enters with a distributed lag. The labour market pressure with a time lag of one and (even stronger) two years is strongest. The following equation is then estimated (with Δ referring to the first difference):

$$\Delta w_g = \alpha_O + \alpha_1 . \Delta p_c + (1-\alpha_1) . \Delta p_{c-1} + \alpha_2 . (L)NN + \alpha_3 . (w_g^* - w_g)_{-1} \qquad [2]$$

with $w_g^* = p_a + 1/(1-\alpha) . tfp^*$

w_g	gross hourly wage rate in enterprises (wage cost minus social security contributions of employers)
p_c	consumption price
NN	labour market pressure indicator
α	labour share in value added
tfp	total factor productivity

The results are as follows:

	coeff.	t-stat
α_0	-0.07	(-7.5)
α_1	0.81	(5.8)
α_2	0.64	(8.1)
α_3	0.08	(4.8)

R^2: 0.94 D.W.: 2.78 Sample: 1970-1994 Estimated with Ordinary Least Squares.

48. The short term indexation-coefficient is indeed smaller than 1 as nominal wage rigidity has somewhat increased since the beginning of the 80s.

49. The correction from the long term equilibrium seems to be significantly different from 0, but its value is low, indicating that the relationship between total factor productivity and real wages holds only for the long term.

50. The nominal wage cost evolution from 1997 onwards is more or less exogenous so that the wage evolution can not be estimated using a wage equation. But using the estimated wage equation with the hypothesis that the labour market pressure will not improve in the coming years, the equation would predict only a slightly positive real hourly wage growth, indicating that the labour market probably would have had an important downward pressure on wages if wage formation were left to the market.

BIBLIOGRAPHY

BOGAERT, H., T. de BIOLLEY and J. VERLINDEN (1991). *"L'ajustement des salaires face aux chocs pétroliers et les réponses de la politique économique." Planning Paper* No. 53, August.

CALMFORS, L. and J. DRIFILL (1988). "Centralisation of wage bargaining and macro-economic performance." *Economic Policy*, No. 6.

COE, D.T. (1985). "Nominal wages, the NAIRU and wage flexibility." *OECD Economic Studies*, No. 5.

EUROPEAN COMMISSION (1995). "The composition of unemployment from an economic perspective." Technical note, II/001/95.

HERTVELDT, B. and J. VERLINDEN. "Macro-economic supply side mechanisms of the Belgian economy." Federal Planning Bureau, forthcoming.

GIORNO, C., P. RICHARDSON, D. ROSEVEARE and P. VAN DEN NOORD (1995). 'Estimating potential output, output gaps and structural budget balances." OECD *Working Paper* No. 152.

LAYARD, R., S. NICKELL and R. JACKMAN (1991). "Unemployment, macroeconomic performance and the labour market." Oxford University Press.

OECD (1996). "The distribution of earnings in selected OECD-countries, Annex 4 Earnings mobility." Working Party No. 1 October.

VALENDUC, C. (1996). *"Imposition des revenus, des facteurs de production et de la consommation en Belgique', Documentatieblad - Ministerie van Financiën."* December.

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