



Economics Department

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**ADJUSTMENTS TO THE OECD'S METHOD
OF PROJECTING THE NAIRU**

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Assessing possible effects on structural unemployment

Part of the large rise in unemployment is likely to become structural

1. The current crisis implies a severe shock to labour markets which is likely to halt and partly reverse the fall in the structural unemployment rate observed since the beginning of the 2000s.¹ This note presents the methodology applied in the *Economic Outlook 85*² to assess how the massive increase in unemployment is likely to translate into higher structural unemployment as a result of so-called 'hysteresis' effects. This revision of the NAIRU projections does not imply any changes to the current methodology used to estimate the NAIRU in OECD countries over history nor re-estimations of the historical NAIRUs.

To project increases in long-term unemployment...

2. Given the role played by long-term unemployment in hysteresis mechanisms, the impact of the expected higher aggregate unemployment on long-term unemployment is used to assess the possible impact of the ongoing crisis on structural unemployment. More precisely simple dynamic regressions were estimated explaining long-term unemployment in terms of aggregate unemployment and then applied to the projected increase in aggregate unemployment to provide conditional projections of long-term unemployment.

... simple equations related to aggregate unemployment are estimated

3. The impact of higher aggregate unemployment on long-term unemployment is derived from simple dynamic regressions between the two variables:

$$LTU = a + b_1 * LTU(-1) + b_2 * LTU(-2) + c_0 * UNR + c_1 * UNR(-1) + c_2 * UNR(-2). \quad [1]$$

Where LTU is the long-term unemployment rate and UNR the unemployment rate (both expressed as a percentage of the aggregate labour force). The long-term unemployment data comes from the OECD labour force statistics and is only available at an annual frequency in most

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1. The structural unemployment rate is defined as the rate of unemployment consistent with stable inflation (the so-called NAIRU, or non-accelerating inflation rate of unemployment). The general background to and details of previous OECD work estimating time-varying NAIRUs within the Phillips curve framework are given by Richardson *et al.* (2000). The time-varying NAIRU is obtained *via* the estimation of a reduced form Phillips curve equation using a Kalman filter procedure. The most recent updating exercise (Gianella *et al.*, 2008) suggests that the structural unemployment rate for most OECD economies over the decade to the 2007 has fallen substantially, in particular for the euro area. During this period, the decline in the NAIRU raised the rate of potential output by approximately 0.1 percentage point *per annum* in the euro area and by about half that in the United States.
 2. Chapter 4. Beyond the crisis: medium-term challenges relating to potential output, unemployment and fiscal positions.

countries. A limitation to the exercise is that the condition for unemployed to be counted as long-term unemployed has changed over time in some countries and still varies across countries. These equations have been estimated on a country-by-country basis and the main results of the estimations are provided in Table 1. Tests of common coefficients for all countries and for meaningful groups of countries were all rejected.

Table 1. **Summary of estimations results of long-term unemployment equations**

	LTU-1	LTU-2	UNR	UNR-1	UNR-2	R2 adj	Effect of a unit shock to UNR on LTU
Australia	0.61	-0.21	0.31	ns	ns	0.98	0.51
Austria	0.27	ns	0.32	ns	ns	0.38	0.44
Belgium	0.52	ns	ns	0.41	ns	0.84	0.84
Canada	0.95	ns	0.14	ns	-0.11	0.95	0.50
Czech Republic	0.49	ns	0.40	ns	ns	0.98	0.78
Denmark	0.20	ns	0.20	0.11	ns	0.93	0.39
Finland	0.66	-0.26	0.24	ns	ns	0.98	0.41
France	0.34	ns	0.32	ns	ns	0.95	0.49
Germany	0.40	ns	0.51	ns	ns	0.99	0.85
Greece	0.58	ns	0.62	-0.33	ns	0.97	0.67
Hungary	0.48	ns	0.31	ns	ns	0.94	0.58
Iceland	0.57	ns	0.12	ns	ns	0.89	0.27
Ireland	0.37	ns	0.47	ns	ns	0.99	0.75
Italy	0.70	ns	0.73	-0.47	ns	0.93	0.86
Japan	0.61	ns	0.18	ns	ns	0.99	0.47
Korea	ns	ns	ns	0.01	ns	0.86	0.01
Luxembourg	ns	ns	0.14	ns	0.12	0.79	0.26
Mexico	ns	ns	ns	0.03	ns	0.49	0.06
Netherlands	0.29	ns	0.44	ns	ns	0.97	0.62
New Zealand	0.75	-0.27	0.23	ns	ns	0.98	0.44
Norway	0.93	-0.33	0.15	ns	ns	0.90	0.38
Poland	0.40	ns	0.44	ns	ns	0.98	0.74
Portugal	0.27	ns	0.51	ns	ns	0.93	0.71
Slovak Republic	0.61	ns	0.23	0.49	-0.39	0.98	0.85
Spain	0.32	ns	0.55	ns	ns	0.98	0.80
Sweden	0.85	ns	0.17	ns	-0.12	0.96	0.39
Switzerland	0.35	ns	0.15	0.20	ns	0.87	0.55
Turkey	0.57	ns	0.22	ns	ns	0.50	0.50
United Kingdom	0.76	-0.29	0.34	ns	ns	0.99	0.64
United States	0.77	-0.22	0.08	ns	ns	0.77	0.17

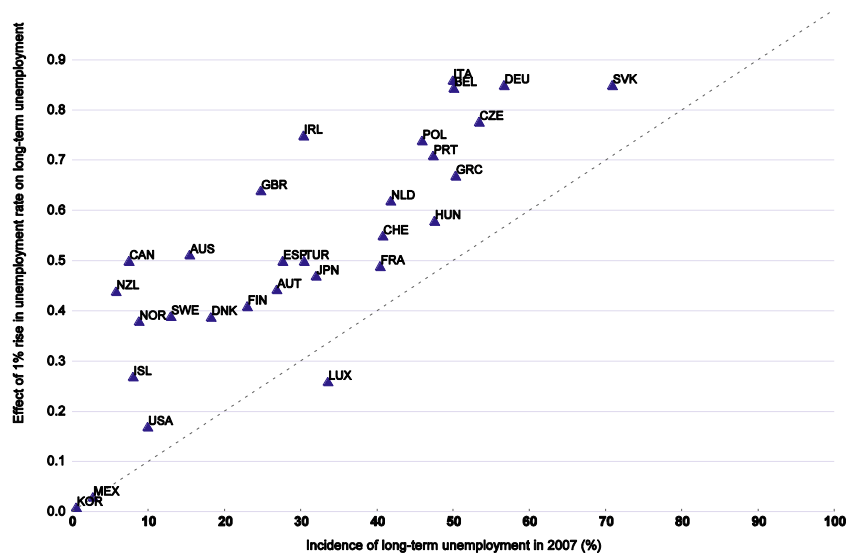
Note: All coefficients are statistically significant to at least a 10% level. Constants are not reported here.
Source: OECD calculations.

Cross-country differences are significant

4. The effect of a sustained unit increase in unemployment on long-term unemployment varies across countries, broadly in line with the initial incidence of long-term unemployment. In the short run, the incidence of long-term unemployment declines before rising in close to half of the countries (including the four largest). The long-term impact of a sustained unit increase in unemployment on long-term unemployment is in nearly all cases higher than the actual share of long-term unemployment (which varies from close to zero in Korea to more than three-quarters of the unemployed in Slovakia) implying that the incidence of long-term unemployment rises with unemployment (Figure 1). Among the countries where the difference between the impact of an increase in unemployment

on long-term unemployment and the incidence of long-term unemployment where large only Spain failed a stability Chow tests, suggesting that labour market reforms since the mid-1990s could have affected the dynamic between unemployment and its long-term component. To take into account this possible impact the long-term impact of a unit shock was rescaled so that the difference between the impact of an increase in unemployment on long-term unemployment and the incidence of long-term unemployment was equal to the OECD average.

Figure 1. Long-term impact of a unit increase of unemployment on its long-term component



Source: OECD Labour Force Statistics; OECD calculations, based on estimated equations reported in Table 1.

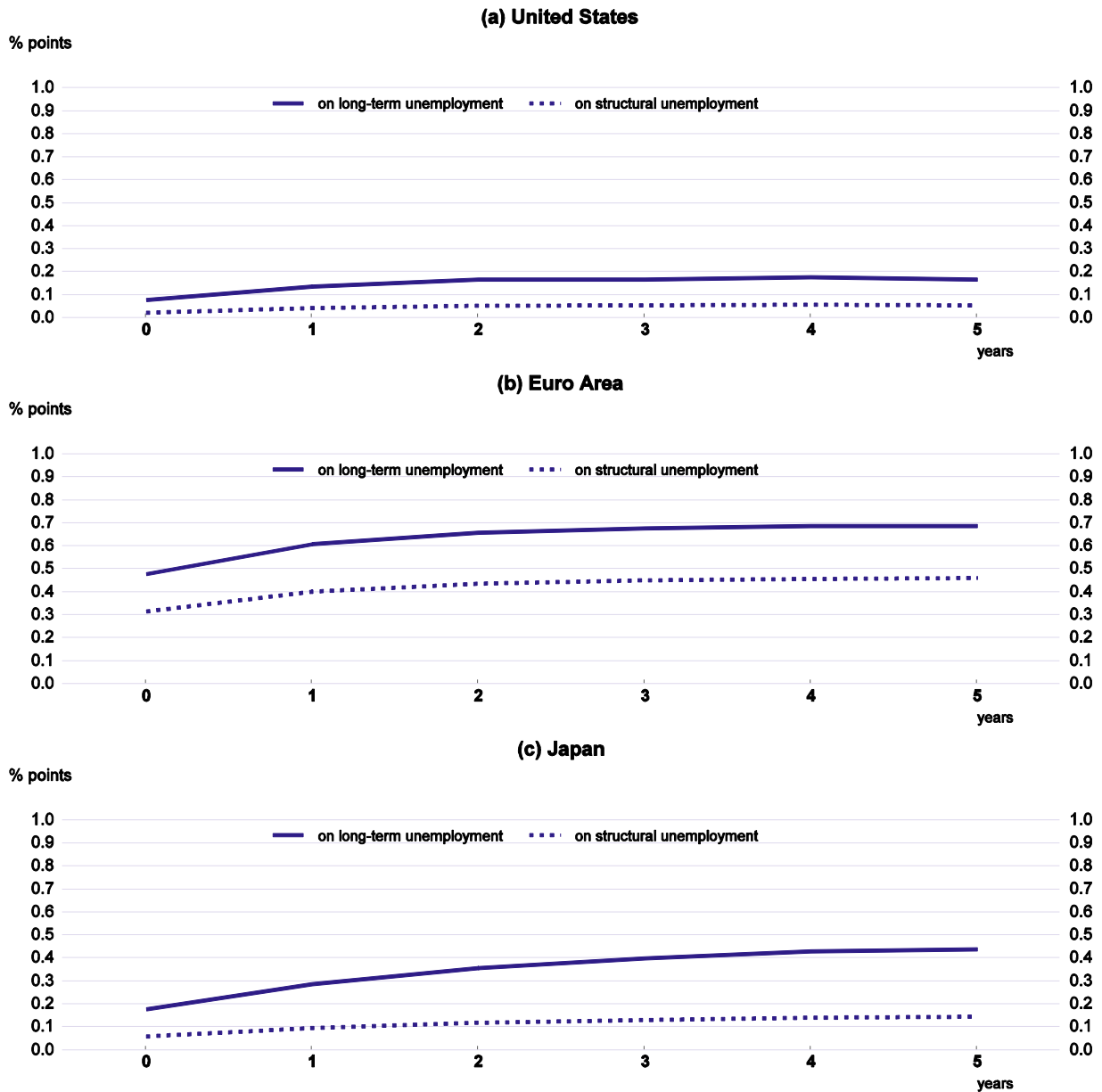
Notably between European and non-European countries

5. An example of the cross-country differences is illustrated by Figure 2 which shows the impact of a sustained increase in unemployment on its long-term component for the euro area, Japan and the United States. After a permanent shock on unemployment, 70% of the unemployed eventually become long-term unemployed in Europe, a bit less than half in Japan and less than 20% in the United States. Within the euro area differences are also significant.

The approach could be improved in several ways

6. This simple approach does not take into account either possible asymmetries between upturns and downturns in the reaction of long-term unemployment to changes in unemployment nor non-linear effects that may be associated with the magnitude of the current shock. Moreover, changes in labour and product market institutions may affect both the incidence of long-term unemployment and its short-term dynamics. A better framework may then be able to control for changes in labour market institutions and take into account the interactions between changes in unemployment and labour and product market institutions. This suggests a possible extension of this work by assessing the impact of institutions on the response of long-term unemployment to unemployment shocks.

Figure 2. The impact of a sustained unit increase in the unemployment rate on its long-term and structural components



Note: The euro area aggregate response is calculated as a weighted average of member countries impact.

Source: OECD calculations.

The impact on long-term unemployment on NAIRUs varies

7. There is not a one-to-one relationship between long-term unemployment and structural unemployment, rather it depends on the relative effect of long- and short-term unemployment on wage bargaining and inflation. A number of studies, including Elmeskov and MacFarlan (1993) and Llaudes (2005), suggest that across virtually all OECD countries the long-term unemployed exert significantly less pressure on wages than the short-term unemployed. The more recent of these studies shows that the relative impact of the long-term unemployed on wages and prices varies across countries and is systematically much lower in Europe than non-European countries. This implies that the share of the increase in long-term unemployment that is translated into structural unemployment is larger in Europe than elsewhere. It can be estimated at three-quarters in Europe and one-third elsewhere.³ To take into account that there have important reforms in the European labour markets to increase its flexibility, it was decided to reduce the share of long-term unemployment that translated into increases in the NAIRU in Europe to two-thirds instead of three-quarters. In the case of the United Kingdom the lower share of one-third (similar to that for non-European countries) was used to take into account less tight employment protection and more flexible labour markets than in the rest of Europe.⁴

Taking into account past reforms

8. For most countries, the estimated increase of the NAIRU since 2007 has been applied to a baseline where the NAIRU were assumed to be flat. For some countries, recent substantial labour market reforms were expected to have a negative impact on the NAIRU over the projection period. For these countries (Germany, Slovakia, Poland, Sweden and Denmark) the baseline includes the impact of the reforms on the NAIRU (as projected in the *Economic Outlook 84*) so that there is some offset to the hysteresis. This impact is of about 0.2 percentage points from 2007 to 2011 in Denmark and Germany, 0.5 percentage points in Sweden, 2.7 percentage points in Slovak Republic and 4.3 percentage points in Poland.

Overall structural unemployment is expected to increase substantially

9. Based on this approach, the estimated increase in structural unemployment due to hysteresis effects from 2007 to 2011 varies widely across countries, reflecting the magnitude of the unemployment shock and the past behaviour of long-term unemployment (Figure 3). The largest increases in structural unemployment are registered in those European countries that are experiencing the largest increase in unemployment (such as Spain and Ireland). The United States, despite a significant increase in unemployment would register a much smaller increase in the NAIRU than most European countries where unemployment increases by less.

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3. For European countries, Llaudes (2005) typically finds that an increase in long-term unemployment only has one-quarter the inflationary effect of an equivalent increase in short-term unemployment. This result can be interpreted as showing that a 4 percentage point increase in long-term unemployment would be required to have the same effect on inflation as a 1 percentage point in short-term unemployment, so that three-quarters of the rise in long-term unemployment might be considered as increasing the NAIRU.
4. Llaudes (2005) suggests for instance that looser EPL tends to increase the ability of the long-term unemployed to affect prices and wages.

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