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**Research Report**

## An analysis of youth unemployment in the euro area

ECB Occasional Paper, No. 89

**Provided in Cooperation with:**

European Central Bank (ECB)

*Suggested Citation:* Gomez-Salvador, Ramon; Leiner-Killinger, Nadine (2008) : An analysis of youth unemployment in the euro area, ECB Occasional Paper, No. 89, European Central Bank (ECB), Frankfurt a. M.

This Version is available at:

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EUROPEAN CENTRAL BANK

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**OCCASIONAL PAPER SERIES**

**NO 89 / JUNE 2008**

**AN ANALYSIS OF  
YOUTH UNEMPLOYMENT  
IN THE EURO AREA**

by Ramon Gomez-Salvador  
and Nadine Leiner-Killinger



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# AN ANALYSIS OF YOUTH UNEMPLOYMENT IN THE EURO AREA<sup>1, 2</sup>

by Ramon Gomez-Salvador and  
Nadine Leiner-Killinger



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<sup>1</sup> We are grateful for the very helpful comments made by Hans-Joachim Klöckers, Gerard Korteweg, Ad van Riet, Neale Kennedy, Rolf Strauch and an anonymous referee, as well as for the discussions with and support from Etienne Wasmer.

<sup>2</sup> The views expressed in this paper do not necessarily reflect those of the European Central Bank.

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ISSN 1607-1484 (print)  
ISSN 1725-6534 (online)

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## ABSTRACT

The paper starts by presenting some stylised facts on youth unemployment over the last two decades, both at the euro area and the country level. It shows that despite declining considerably over the last few years, youth unemployment has remained at a high level relative to other age groups in most euro area countries.

The paper finds that there is a positive relationship between the share of young people in the total population and the youth unemployment rate, i.e. the smaller the share of young people in the population, the lower the risk of them being unemployed. At the same time, economic conditions are negatively correlated with the youth unemployment rate, i.e. the youth unemployment rate increases when the economic situation worsens. Moreover, robust results across the regression scenarios show that higher employment protection and minimum wages imply a higher youth unemployment rate, while active labour market policies (ALMPs) tend to reduce it. The results also indicate that the increasing share of services employment in total employment is helping to reduce unemployment among young persons. Furthermore, the increase in the youth inactivity rate, which is mainly due to the fact that there are more young people in education, is also linked to the overall decline in youth unemployment. Finally, as regards education, the results indicate that the number of years of education, the number of young people with vocational training and, to a lesser extent high scores in the PISA study, are associated with lower youth unemployment rates. The share of the young population not in school, however, is positively correlated with the unemployment rate.

As youth unemployment is subject to certain country-specific features, each country should identify the relevant underlying sources of youth unemployment and react accordingly. Governments can make a positive contribution to the smooth transition of young persons from

education to the labour market by providing a well-functioning education system and labour market institutions that do not introduce distortions into the labour market.

JEL codes: I2, J11, J13, J21, J64

Keywords: youth, unemployment, employment, demographic trends, institutions, education.



## EXECUTIVE SUMMARY

Despite declining considerably over the last few years, youth unemployment has remained at a high level relative to other age groups in most euro area countries. Youth unemployment is of particular concern as people who become unemployed during their early working years may become demoralised, and people who fail to find a job after leaving full-time education may see a depreciation in their human capital and a deterioration in their employment prospects, which could lead to social exclusion. At the same time, youth unemployment is problematic not only for those affected, but also for the economy as a whole. First, unemployment among young persons implies unutilised labour potential and thus has a negative impact on potential growth. Given that populations in euro area countries will age in the years to come and that the labour force is expected to decline, it will become increasingly important to make full use of the potential of young people. Second, youth unemployment means that there is less labour input from those who, despite having less work experience than older workers, are supposed to improve production processes with their more up-to-date and innovative expertise.

In 2007 youth unemployment in the euro area (15.3%) was more than double unemployment among prime age workers aged 25 to 54 (6.6%). In 1983, however, the youth unemployment rate was more than three times higher than the unemployment rate for prime age workers, i.e. 20.2% compared with 6.0%. The relative labour market position of young workers has therefore improved slightly over the last two decades. One may conjecture that there are some signs that there has been a structural improvement in the euro area youth labour market in recent years. While the peak of youth unemployment was even higher in the mid-1990s than in the mid-1980s, it was lower in 2000 compared with the previous two decades. Looking at euro area youth unemployment as a whole, however, hides the fact that youth unemployment has actually increased in five euro area countries.

An analysis of age groups shows that unemployment tends to decline with age. Just as youth unemployment is higher than prime age unemployment in the euro area, unemployment among teenagers aged 15 to 19 is higher than unemployment among young adults aged 20 to 24, with the unemployment rates having stood at 19.2% and 13.3% respectively in 2007. Long-term unemployment can significantly affect even young people in the labour force. For the euro area as a whole, the percentage of unemployed young persons aged 15 to 24, who had been unemployed for more than a year, was 27% in 2007. However, the decline in the share of long-term youth unemployment in total youth unemployment was around three times greater than that for prime age workers. Furthermore, the probability of a young person being unemployed tends to decline, the higher the level of education attained. Between 1995 and 2007 the rate of unemployment in the euro area declined most significantly for young persons with tertiary education (-14.7 percentage points). However, there are also indications of a deterioration in the relative labour market position of young high-skilled persons in some euro area countries.

The decline in the euro area youth unemployment rate over the last two decades has been accompanied by a decline in the employment rate of young persons. Nevertheless, the fact that the euro area youth employment rate bottomed out in 1997 may be a sign of a more general improvement in the labour market for young persons in recent years. As regards the employment of young persons by sector, young employees in the euro area work predominantly in the services sector. Despite the fact that from 1995 the increase in the share of young workers employed in the services sector was much stronger than that for prime age workers, namely 7.6 percentage points compared with 5.3 percentage points, in 2007, this employment share remained slightly below that of prime age workers (67.4% compared with 68.7%). At the same time, there are more young persons engaged in part-time and temporary work than prime age workers,

this difference having increased over the last two decades. Overall, one may conjecture that, in the light of the falling employment rate, the decline in the unemployment rate may be masking an increase in inactivity, i.e. the fact that young people are either in education or have given up looking for a job completely and are not in education.

Some stylised facts for the euro area can be derived from a review of the literature on youth unemployment. These include, inter alia, a high correlation between the decline in the unemployment rate among young relative to prime age persons and the steady fall in the size of this population group relative to prime age persons. In 1983 youth unemployment was three and a half times higher than prime age unemployment, while the youth population made up roughly a third of the prime age cohort. In 2007 youth unemployment was still more than double prime age unemployment, but its cohort size relative to prime ages had shrunk to less than a quarter. Consequently, the absolute decline in the size of the youth cohort relative to that of prime age persons seems to have supported the decline in the youth unemployment rate over the last two decades.

A simple regression analysis facilitates the gathering of information on potential determinants of youth unemployment. These include changes in the economic environment, demographic changes, selected labour market institutions and policies, the importance of the services sector and inactivity, and various education system indicators. The results show that there is a positive relationship between the share of young people in the total population and the youth unemployment rate, i.e. in an ageing population, the smaller share of young persons means that there is a lower risk of them being unemployed. The economic environment is also correlated with the youth unemployment rate, i.e. when the economic situation deteriorates, the youth unemployment rate increases. At the same time, the youth unemployment rate is found to be more volatile than the unemployment rate among prime age persons. Furthermore,

the increase in the youth inactivity rate, which appears to have accompanied the decline in youth unemployment, indicates that education has become an alternative to unemployment in several euro area countries.

Turning to labour market institutions and policies, relatively robust results across the regression scenarios show that higher employment protection and minimum wages imply a higher youth unemployment rate, while ALMPs tend to reduce it. As regards the share of services employment in total employment, the results also indicate that the increasing share of services employment is helping to reduce unemployment among young persons. Furthermore, taking into account the role of educational attainment, the results indicate that the number of years of education, the number of young people with vocational training and, to a lesser extent, high scores in the PISA study, are associated with lower youth unemployment rates, while the share of the young population not in school is positively correlated with the youth unemployment rate. However, these correlations should be viewed as indicative only, as a simple correlation analysis cannot capture the complex relationship between educational systems and labour market outcomes.

Looking forward, economic policies should aim to improve the employability of young persons to further reduce youth unemployment. This implies further adjustment to those labour market institutions, such as employment protection legislation and insufficiently flexible working time arrangements, which may constitute a barrier to young persons' employment opportunities. Generally, a high level of educational attainment plays a major role, particularly in the light of the increasing importance of technological advances. Although policies aimed at raising the general level of education may not necessarily result in lower youth unemployment straight away, the existence of a large pool of educated workers may encourage firms to create more positions for high-skilled workers, i.e. with supply creating its own demand. After a few years,



this may result in a general improvement in the economy – higher productivity and higher employment. As youth unemployment is subject to certain country-specific features, each country should identify the relevant underlying sources of youth unemployment and react accordingly. Governments can make a positive contribution to the smooth transition of young persons from education to the labour market by providing a well-functioning education system and labour market institutions that do not introduce distortions into the labour market.

## I INTRODUCTION

Despite declining considerably over the last years, youth unemployment has remained at a high level relative to other age groups in most euro area countries and thus remains a serious problem. Youth unemployment is of particular concern as people who become unemployed during their early working years may become demoralised, and people who fail to find a job after leaving full-time education may see a deterioration in their human capital and employment prospects, which could lead to social exclusion. At the same time, youth unemployment is problematic not only for those affected, but also for the economy as a whole. First, unemployment among young persons implies unutilised labour potential and thus has a negative impact on potential growth. Given that populations in euro area countries will age in the years to come and that the labour force is expected to decline, it will become increasingly important to make full use of the potential of young people. Second, youth unemployment means that there is less labour input from those who, despite having less work experience than older workers, are supposed to improve production processes with their more up-to-date and innovative expertise. Finding solutions to the youth unemployment problem requires both a rigorous analysis of its main causes, as well as a comprehensive assessment of policies that would improve the employability of young persons.

Against this background, this paper analyses the problem of youth unemployment in the euro area and compares developments across euro area countries. Section 2 examines the data used, as well as some key features of youth unemployment, employment and inactivity in the euro area. Section 3 briefly reviews the literature on the causes of youth unemployment and presents some evidence and stylised facts regarding the euro area. Section 4 presents a simple econometric model on youth unemployment in the euro area and Section 5 derives some policy conclusions.

## 2 YOUTH UNEMPLOYMENT IN THE EURO AREA: STYLISED FACTS

### 2.1 THE DATA

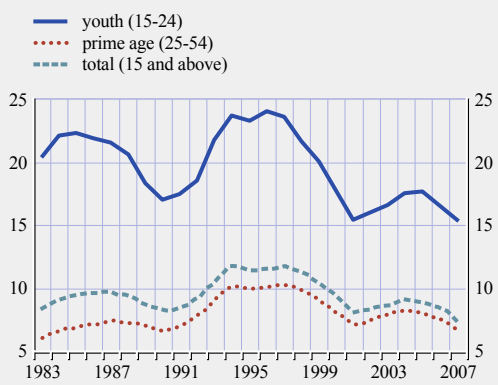
The UN standard definition of youth refers to the age group 15 to 24 inclusive, with 15 being the statutory minimum school leaving age in most industrial countries. This group is further broken down into teenagers aged 15 to 19 and young adults aged 20 to 24. The position of young people in the labour market is mostly assessed by comparing it to labour market outcomes for prime age workers (aged 25 to 54). The analysis in this paper uses this distinction of age groups where data availability allows, otherwise age groups are adjusted slightly. The main data sources used include the EU Labour Force Survey (EU LFS) and the OECD data surveys published in “*Education at a glance*”. The following analysis of developments in youth unemployment concentrates on the period from 1983 to 2007, as EU LFS data are usually available for most euro area countries from 1983 onwards.<sup>1</sup> For some indicators, however, time series are shorter, often starting only in 1995. As regards the LFS data, which have only recently started to be published on a quarterly basis, the data chosen usually refer to the second quarter.<sup>2</sup> One problem with the LFS data is that they capture the likelihood of being unemployed irrespectively of whether young people are still in education or not. They therefore also include those young persons who are still in education but looking for a job. This tends to boost unemployment numbers. A clearer distinction of young persons according to whether or not they participate in education is feasible on the basis of OECD data, which, however, only cover those aged 20 to 24 in the 15-24 age group. Data for non-euro area countries, which are mainly used in the econometric analysis, also come from Eurostat, except those for Australia, Canada and the United States, which are compiled by the OECD.

### 2.2 TRENDS IN YOUTH UNEMPLOYMENT

As Chart 1 indicates, youth unemployment in the euro area is much higher than prime age and total

Chart 1 Developments in euro area unemployment according to age group (%), 1983-2007

(unemployed as a percentage of the labour force)



Sources: Eurostat (EU LFS) and ECB calculations.

unemployment. In 2007 youth unemployment stood at 15.3%, which was more than double prime age unemployment, which amounted to only 6.6%. In 1983, however, the youth unemployment rate was more than three times higher than the unemployment rate for prime age workers, i.e. 20.2% compared with 6.0%. The relative labour market position of young workers has therefore improved over the last two decades (see Table 1).

The decline in the youth unemployment rate of 4.9 percentage points between 1983 and 2007 for the euro area overall, turns out to be much smaller, around 1½ percentage points, when developments between the averages of the periods 1983-94 and 1995-2007 are considered in an attempt to take into account cyclical developments.<sup>3</sup> However, one may conjecture that there have been signs of a structural improvement in the euro area youth labour market in recent years. As Chart 1 indicates,

- 1 The paper does not survey developments in Cyprus and Malta, which joined the euro area on 1 January 2008.
- 2 France and Austria, however, have only more recently started to publish second-quarter data in addition to first-quarter data. Consequently, when longer time series are used, data for France and Austria refer to the first quarter.
- 3 Over these two periods, euro area real GDP growth was broadly comparable (around 2.3% on average). At the country level, although there was a degree of variability, economic developments in both periods were, on average, broadly comparable in most cases.

**Table 1 Youth and prime age unemployment in euro area countries, 1983-2007**

(unemployed as a percentage of the labour force)

	Youth unemployment (15-24)			Prime age unemployment (25-54)		
	Level (%) 2007	Change (p.p.) from 1983 to 2007	Change (p.p.) from 1983-94 to 1995-2007	Level (%) 2007	Change (p.p.) from 1983 to 2007	Change (p.p.) from 1983-94 to 1995-2007
Belgium	19.2	-4.7	-0.2	6.8	-2.7	-1.1
Germany	12.1	3.7	4.2	7.8	3.4	3.3
Ireland	8.9	-12.5	-13.1	4.0	-9.4	-9.2
Greece	22.0	-1.0	2.7	7.6	1.5	2.6
Spain	18.2	-22.3	-12.4	6.9	-5.5	-2.7
France	20.6	0.8	-0.3	7.5	2.0	1.0
Italy	18.5	-10.4	-2.6	5.0	0.7	1.4
Luxembourg	14.9	9.0	4.6	3.4	1.4	1.0
Netherlands	6.1	-15.0	-6.7	2.5	-7.3	-4.1
Austria	8.0	3.8	2.6	4.2	1.3	1.0
Portugal	15.3	-0.3	-1.5	7.8	3.1	0.8
Slovenia	7.9	n.a.	n.a.	4.4	n.a.	n.a.
Finland	21.6	3.4	8.1	5.3	0.4	2.0
Euro area	15.3	-4.9	-1.6	6.6	0.6	1.0

Sources: Eurostat (EU LFS) and ECB calculations.

Note: The data are second-quarter data, except for France and Austria, for which they are first-quarter data. The change (in percentage points) between the period 1983-94 and the period 1995-2007 refers to the change between the average of the period 1983-1994 and the average of the period 1995-2007 in an attempt to take into account cyclical developments.

while the peak of youth unemployment was even higher in the mid-1990s than in the mid-1980s, it was lower in 2000 compared with the previous two decades.

Looking at euro area youth unemployment as a whole, however, masks considerable differences in developments across euro area countries. As Table 1 indicates, youth unemployment rates in 2007 ranged from 22.0% in Greece to 6.1% in the Netherlands. Although youth unemployment was higher than prime age unemployment in all euro area countries in 2007, the difference was smallest in Slovenia (3.5 percentage points) and largest in Finland (16.3 percentage points). In addition, the decline in youth unemployment at the euro area level obscures the fact that youth unemployment actually increased in five euro area countries. Whereas the decline in youth unemployment between the average of 1983-94 and the average of 1995-2007 was largest in Ireland and Spain (13.1 and 12.4 percentage points respectively), the increase in youth unemployment was largest in Finland (8.1 percentage points) followed by Germany and Luxembourg (4.2 and 4.6 percentage points respectively).

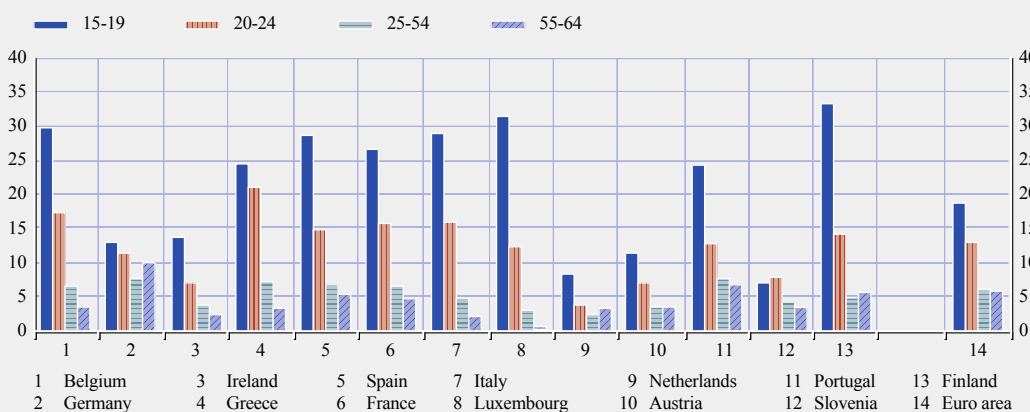
It is worth highlighting that country experiences in terms of developments in youth and prime age unemployment rates are also heterogeneous. Indeed, while the unemployment rate declined between 1983-94 and 1995-2007 in both age groups in Belgium, Ireland, Spain and the Netherlands, it increased in both cases in Germany, Greece, Luxembourg, Austria and Finland (see the third and sixth columns of Table 1). At the same time, three countries, namely France, Italy and Portugal, recorded a decline in the youth unemployment rate, but an increase in the prime age unemployment rate.

An analysis of age groups shows that unemployment tends to decline with age (see Chart 2). Just as euro area youth unemployment is higher than prime age unemployment, unemployment among teenagers is higher than that among young adults, with the unemployment rates having stood at 19.2% and 13.3% respectively in 2007. This applies to all euro area countries except Slovenia, although the gap varies considerably across countries.

Turning to the incidence of long-term unemployment (typically defined as

Chart 2 Unemployment according to age group, 2007

(unemployment as a percentage of the labour force)



Source: Eurostat (EU LFS).

unemployment exceeding a period of one year), Table 2 shows that it can significantly affect even young people in the labour force. For the euro area as a whole, the percentage of young unemployed persons aged 15 to 24, who had been unemployed for more than a year, was 27.0% in 2007. Since 1995, however, this percentage has fallen in all euro area countries, apart from France, Austria and Germany, where it has increased significantly. For the euro area as a whole, the decline in the share

of long-term youth unemployment in total youth unemployment (measured in percentage points) is almost three times greater than that for prime age persons.

For the euro area as a whole, the risk of a young person being unemployed tends to decline the higher the level of education attained (see Table 3). Regarding the decline in youth unemployment rates according to the level of education attained, the rate of unemployment in

Table 2 Youth and prime age long-term unemployment in euro area countries, 1995-2007

(long-term unemployed as a percentage of total unemployed)

	Youth unemployment (15-24)			Prime age unemployment (25-59)		
	Level (%) 1995	Level (%) 2007	Change (p.p.) from 1995 to 2007	Level (%) 1995	Level (%) 2007	Change (p.p.) from 1995 to 2007
Belgium	44.4	33.4	-11.0	68.0	54.5	-13.5
Germany	26.8	33.6	6.8	51.6	59.9	8.3
Ireland	48.1	21.3	-26.8	66.4	33.7	-32.7
Greece	49.8	41.3	-8.5	52.2	52.2	0.0
Spain	45.9	9.5	-36.4	58.6	24.2	-34.4
France	23.7	24.5	0.8	45.4	47.2	1.8
Italy	52.2	45.2	-7.0	55.6	51.4	-4.2
Luxembourg	33.3	30.0	-3.3	25.3	37.0	11.7
Netherlands	32.9	14.8	-18.1	51.6	51.7	0.1
Austria	14.0	14.7	0.7	31.2	34.5	3.3
Portugal	41.4	27.0	-14.4	55.4	50.8	-4.6
Slovenia	40.0	33.9	-6.1	55.3	51.5	-3.8
Finland	17.3	4.5	-12.8	43.8	31.5	-12.3
Euro area	40.5	27.0	-13.5	53.0	48.3	-4.7

Sources: Eurostat (EU LFS) and ECB calculations.

**Table 3 Youth unemployment rates according to the highest level of education attained (%), 1995-2007**

(as a percentage of labour force by education)

	"Primary" education			"Secondary" education			"Tertiary" education		
	Level (%) 1995	Level (%) 2007	Change (p.p.) 1995-2007	Level (%) 1995	Level (%) 2007	Change (p.p.) 1995-2007	Level (%) 1995	Level (%) 2007	Change (p.p.) 1995-2007
Belgium	31.6	26.0	-5.6	19.8	19.0	-0.8	11.5	11.7	0.2
Germany	9.7	16.1	6.4	7.4	8.5	1.1	6.1	n.a.	n.a.
Ireland	31.1	16.9	-14.2	14.4	7.6	-6.8	9.0	5.2	-3.8
Greece	20.1	16.8	-3.3	32.8	22.3	-10.5	32.3	33.3	1.0
Spain	40.7	20.2	-20.5	43.5	17.9	-25.6	43.8	11.9	-31.9
France	35.4	33.8	-1.6	23.6	16.5	-7.1	20.1	12.9	-7.2
Italy	31.6	20.6	-11.0	35.9	17.2	-18.7	33.8	20.0	-13.8
Netherlands	15.4 <sup>2)</sup>	8.9	-6.5	6.8 <sup>2)</sup>	3.3	-3.5	11.1 <sup>2)</sup>	n.a.	n.a.
Austria	9.3	9.9	0.6	4.4	5.0	0.6	n.a.	n.a.	n.a.
Portugal	14.4	15.1	0.7	21.5	14.9	-6.6	25.9 <sup>2)</sup>	24.7	-1.2
Slovenia	25.0 <sup>2)</sup>	13.3	-11.7	14.5 <sup>2)</sup>	6.4	-8.1	n.a.	n.a.	n.a.
Finland	55.9	32.8	-23.1	33.4	13.6	-19.8	18.0	n.a.	n.a.
Euro area	27.5	18.9	-8.6	20.4	12.0	-8.4	25.6	10.9	-14.7

Sources: Eurostat (EU LFS) and ECB calculations.

Notes:

1) For simplification, the education categories are primary, secondary and tertiary, which refer categories 0-2, 3-4 and 5-6, respectively under the International Standard Classification of Education 1997 (ISCED). ISCED 0-2 refer to pre-primary, primary and lower secondary education. ISCED 3-4 refer to upper secondary and post-secondary non-tertiary education. ISCED 5-6 refer to tertiary education. See Annex 1 for details.

2) The data for 1995 refer to 1996.

the euro area between 1995 and 2007 declined most significantly among young persons with tertiary education (-14.7 percentage points), then among those with primary education (-8.6 percentage points) and those with secondary education (-8.4 percentage points).<sup>4</sup> However, there are signs that the relative labour market position of young high-skilled persons may be deteriorating slightly in some countries. In Greece, for example, young persons with tertiary education are more likely to be unemployed than those with secondary education. In Italy, the unemployment rate among young persons with tertiary education is higher than among those with secondary education and only slightly below the unemployment rate among those with only primary education. In Portugal, the unemployment rate among those with tertiary education is higher than that among both those with primary and secondary education. At the same time, in Belgium and Greece, the unemployment rate even remained stable or increased for young persons with tertiary education, but fell for those with secondary education. At the same time, the unemployment

rate of those young persons who have obtained secondary education declined less strongly than for those with primary education in Belgium, Ireland, the Netherlands, Slovenia, and Finland.

Unemployment data for young persons aged 15 to 24 who have completed tertiary education should be interpreted with caution, as many young persons have not completed their studies by the age of 25 due to the long duration of education in some countries. Consequently, the unemployment rate among those young persons with tertiary education is not fully representative and not fully comparable across countries. However, in the light of the fact that the governments of those countries where it takes young people a particularly long time to enter the labour market appear to be trying to reduce the duration of education, it is still interesting to look at the group of young people who do manage to complete a tertiary degree before the age of 25.

4 See the notes to Table 3 for a more precise definition of primary, secondary and tertiary education.



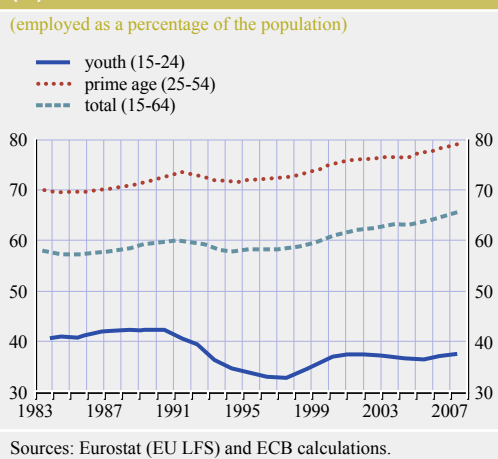
### 2.3 TRENDS IN YOUTH EMPLOYMENT

In order to gain a more complete picture of the labour market situation among the youth population, it is useful to supplement the information on unemployment rates with some information on employment rates, i.e. the number of employed relative to the working age population. This shows that the decline in the euro area youth unemployment rate over the last two decades was accompanied by a decline in the employment rate among young persons. In fact, as Chart 3 shows, the employment situation among youths relative to prime age persons deteriorated over this period, as the gap in employment rates rose from roughly 30 percentage points at the beginning of the 1980s to more than 40 percentage points in 2007.

As Table 4 shows, this is explained by a 4.5 percentage point decline in the youth employment rate between the average of 1983-94 and the average of 1995-2007, together with a more than 4 percentage point increase in that of prime age persons.

Only four countries recorded an increase in the youth employment rate between these two

**Chart 3 Developments in the euro area employment rate according to age group (%), 1983-2007**



periods, namely Spain, Ireland, Finland and the Netherlands, where it rose most considerably (15.8 percentage points). In the remaining countries, youth employment rates declined, especially in Luxembourg, Germany and Portugal. Nevertheless, the fact that the euro area youth employment rate bottomed out in 1997 may be a sign of a more general improvement in the labour market for young persons in recent years (see Chart 3).

**Table 4 Youth and prime age employment rates in euro area countries, 1983-2007**

(employed as a percentage of the population)

	Youth employment (15-24)			Prime age employment (25-54)		
	Level (%)	Change (p.p.)	Change (p.p.)	Level (%)	Change (p.p.)	Change (p.p.)
	2007	from 1983 to 2007	from 1983-94 to 1995-2007	2007	from 1983 to 2007	from 1983-94 to 1995-2007
Belgium	26.8	-6.6	-4.1	79.3	12.0	5.9
Germany	43.7	-4.7	-11.1	80.8	8.2	2.9
Ireland	48.4	0.9	3.9	78.9	21.3	15.3
Greece	24.2	-8.7	-3.3	75.8	11.2	4.8
Spain	39.1	12.9	4.2	77.1	19.7	10.5
France	29.7	-13.0	-7.3	81.4	4.4	2.1
Italy	25.3	-9.1	-6.1	73.6	6.6	2.1
Luxembourg	22.0	-35.1	-20.9	80.1	13.4	6.5
Netherlands	68.6	30.1	15.8	85.4	23.3	12.4
Austria	54.5	1.4	-1.8	83.0	9.9	5.8
Portugal	34.7	-17.3	-10.3	80.9	6.6	4.9
Slovenia	37.2	n.a.	n.a.	85.9	n.a.	n.a.
Finland	48.6	14.4	7.3	83.7	-2.6	-3.9
Euro area	37.3	-2.8	-4.5	79.1	9.4	4.2

Sources: Eurostat (EU LFS) and ECB calculations.

Note: The change from 1983-94 to 1995-2007 refers to the change (in percentage points) between the average of the period 1983-1994 and the average of the period 1995-2007 in an attempt to take into account cyclical developments.

**Table 5 Youth and prime age employment shares by sector, 1995-2007**

(employed aged 15 to 24 and 25 to 59 as a percentage of total employment by sector)

	1995 (%)			15 to 24 2007 (%)			change from 1995 to 2007 (p.p.)		
	Agriculture	Industry	Services	Agriculture	Industry	Services	Agriculture	Industry	Services
Belgium	2.1	34.6	63.3	1.2	27.3	71.5	-0.9	-7.3	8.2
Germany	2.3	36.9	60.8	2.0	29.9	68.1	-0.3	-7.0	7.3
Ireland	6.9	33.3	59.8	1.8	29.3	68.9	-5.0	-4.0	9.0
Greece	16.7	26.4	56.9	9.1	25.1	65.8	-7.5	-1.4	8.9
Spain	7.6	34.9	57.5	4.5	32.6	62.9	-3.1	-2.3	5.4
France	3.8	27.6	68.6	2.8	27.5	69.7	-1.0	-0.1	1.1
Italy	5.0	47.6	47.4	3.1	38.3	58.6	-1.9	-9.3	11.1
Luxembourg	3.3	23.9	72.8	5.1	17.8	77.1	1.8	-6.1	4.3
Netherlands	4.4	20.9	74.7	3.9	14.9	81.2	-0.5	-6.0	6.5
Austria	2.4	37.2	60.3	2.5	32.7	64.8	0.1	-4.6	4.5
Portugal	5.3	49.5	45.2	4.1	38.1	57.8	-1.2	-11.4	12.6
Slovenia	6.4	41.7	51.9	10.3	36.4	53.4	3.9	-5.3	1.4
Finland	8.3	22.8	68.9	3.4	25.0	71.5	-4.9	2.2	2.7
Euro area	4.5	35.7	59.8	3.2	29.5	67.4	-1.3	-6.3	7.6
<b>25 to 59</b>									
Belgium	2.5	27.9	69.6	1.4	24.5	74.2	-1.1	-3.4	4.6
Germany	2.9	36.2	60.9	2.1	30.1	67.7	-0.8	-6.0	6.8
Ireland	10.7	27.7	61.6	4.9	27.7	67.4	-5.8	0.0	5.8
Greece	16.5	24.3	59.2	9.9	22.8	67.4	-6.6	-1.5	8.2
Spain	8.0	30.3	61.7	4.2	29.2	66.6	-3.8	-1.1	4.9
France	4.6	27.2	68.2	3.5	23.2	73.3	-1.1	-3.9	5.1
Italy	6.2	32.7	61.2	3.8	30.2	66.0	-2.4	-2.5	4.9
Luxembourg	3.7	25.7	70.6	1.3	17.2	81.5	-2.4	-8.5	11.0
Netherlands	3.4	24.0	72.6	2.6	21.4	76.0	-0.8	-2.6	3.4
Austria	7.2	31.6	61.2	5.4	27.1	67.5	-1.8	-4.5	6.3
Portugal	8.5	31.2	60.3	6.5	32.3	61.2	-2.0	1.1	0.9
Slovenia	8.1	43.4	48.5	6.5	36.1	57.4	-1.7	-7.2	8.9
Finland	6.3	28.5	65.2	4.3	26.2	69.5	-2.1	-2.3	4.4
Euro area	5.3	31.3	63.4	3.6	27.7	68.7	-1.7	-3.6	5.3

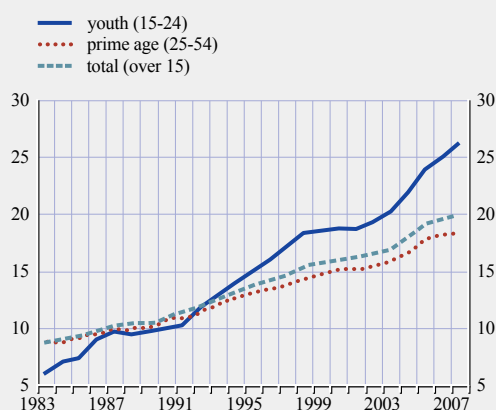
Sources: Eurostat (EU LFS) and ECB calculations.

Note: The data refer to the NACE categories. Agriculture also includes hunting, forestry and fishing.

Table 5 shows that young employees in the euro area work predominantly in the services sector. In 2007, however, the share of young workers employed in the services sector (67.4%) was slightly below that of prime age workers (68.7%), despite the fact that it has grown more rapidly than that of prime age workers, namely by 7.6 percentage points compared with 5.3 percentage points. However, these rather small changes at the euro area level mask significant differences across countries. In 2007 the share of young persons working in the services sector was highest in the Netherlands (81.2%) and lowest in Slovenia (53.4%). Between 1995 and 2007 the sharpest increases in the share of young persons working in the services sector were in Portugal (12.6%) and Italy (11.1%), indicating

**Chart 4 Developments in euro area part-time ratios according to age group, 1983-2007**

(as a percentage of employment)



Source: Eurostat (EU LFS) and ECB calculations.

**Table 6 Part-time ratio: young and prime age employed on part-time contracts, 1983-2007**

(as a percentage of employment)

	Youth part-time ratio (15-24)			Prime age part-time ratio (25-54)		
	Level (%) 2007	Change (p.p.) from 1983 to 2007	Change (p.p.) from 1983-94 to 1995-2007	Level (%) 2007	Change (p.p.) from 1983 to 2007	Change (p.p.) from 1983-94 to 1995-2007
Belgium	21.4	12.7	6.6	22.0	14.1	8.0
Germany	21.1	18.3	9.1	25.8	14.8	7.8
Ireland	25.4	19.4	12.6	15.2	8.6	6.3
Greece	12.0	4.2	2.3	5.0	-0.2	0.2
Spain	21.8	13.8	7.6	10.8	5.9	3.3
France	24.2	15.2	7.4	16.2	6.5	4.8
Italy	18.2	12.9	5.1	13.2	9.6	4.5
Luxembourg	9.6	3.4	0.5	18.3	12.4	6.2
Netherlands	70.3	53.9	27.7	40.3	18.4	9.6
Austria	17.1	9.9	3.7	22.2	8.2	4.5
Portugal	9.5	4.3	2.3	6.7	2.0	1.5
Slovenia	33.0	n.a.	n.a.	4.8	n.a.	n.a.
Finland	33.4	-8.0	-5.9	8.3	0.4	-0.1
Euro area	25.9	20.0	10.1	18.2	9.5	5.2

Sources: Eurostat (EU LFS) and ECB calculations.

Note: The change from 1983-94 to 1995-2007 refers to the change (in percentage points) between the average of the period 1983-1994 and the average of the period 1995-2007 in an attempt to take into account cyclical developments.

that there was a degree of catching-up from the low levels of young people being employed in the services sector in these countries. The smallest increases over this period were recorded in France (1.1%) and Slovenia (1.4%), the former being related to an already rather high level in 1995, while in Slovenia the share of young persons working in the services sector is still low, indicating that there is still scope for some catching-up.

Over the last decade, the share of young persons working on part-time and temporary contracts has increased. As Chart 4 shows, young persons are more engaged in part-time work than prime age workers, this difference having increased over the last two decades.

As Table 6 indicates, in 1983 the level of the part-time ratio in the euro area was about 6% for young workers and 8.7% for prime age workers. In 2007, it had reached 25.9% and 18.2% respectively. Part-time employment is especially high in the Netherlands, where more than 70% of young persons worked part-time in 2007. At the country level, the increase in part-time employment since the early 1980s has been commonly observed among young

persons, with the exception of Finland, where it was already relatively high in 1983.

In addition, the share of young persons working on temporary contracts has steadily increased in recent years, with the incidence of temporary work being almost four times higher for young workers than for prime age workers (49.9% and 13.2%, respectively). As Table 7 indicates, the temporary ratio was over 60% in Spain and Slovenia and over 50% in Germany and Portugal. France saw the strongest increase, at 35.4 percentage points, in the uptake of temporary work by young persons between 1983 and 2007.

#### 2.4 TRENDS IN YOUTH INACTIVITY

Overall, the fact that both the euro area youth unemployment and employment rates have fallen over the last two decades gives a mixed signal with regard to the labour market situation for young persons at the euro area level. Indeed, one may conjecture that, in the light of the falling employment rate, the decline in the unemployment rate may be masking an increase in inactivity, i.e. the fact that young people are either in education or have given

**Table 7 Temporary ratio: young and prime age employees on temporary contracts, 1983-2007**

(as a percentage of employees)

	Youth temporary ratio (15-24)			Prime age temporary ratio (25-54)		
	Level (%)	Change (p.p.)	Change (p.p.)	Level (%)	Change (p.p.)	Change (p.p.)
	2007	from 1983 to 2007	from 1983-94 to 1995-2007	2007	from 1983 to 2007	from 1983-94 to 1995-2007
Belgium	29.2	13.2	10.7	7.2	3.9	2.4
Germany	56.2	21.9	18.3	8.9	3.9	1.3
Ireland	21.2	10.2	-0.5	6.4	2.5	-1.7
Greece	27.0	-1.4	-2.9	10.2	-3.9	-2.9
Spain	62.5	21.8	12.9	29.7	18.5	10.5
France	48.1	35.4	19.7	10.2	8.7	5.6
Italy	42.6	30.8	15.8	11.6	6.2	4.1
Luxembourg	37.5	27.8	7.3	5.4	3.2	0.9
Netherlands	44.0	32.2	16.6	12.9	8.5	3.6
Austria	34.2	15.5	12.5	4.3	0.9	0.5
Portugal	51.6	18.2	7.0	19.7	10.1	4.7
Slovenia	66.6	n.a.	n.a.	13.4	n.a.	n.a.
Finland	47.5	-0.5	1.5	13.7	-0.4	-0.1
Euro area	49.9	25.1	15.9	13.2	7.9	4.3

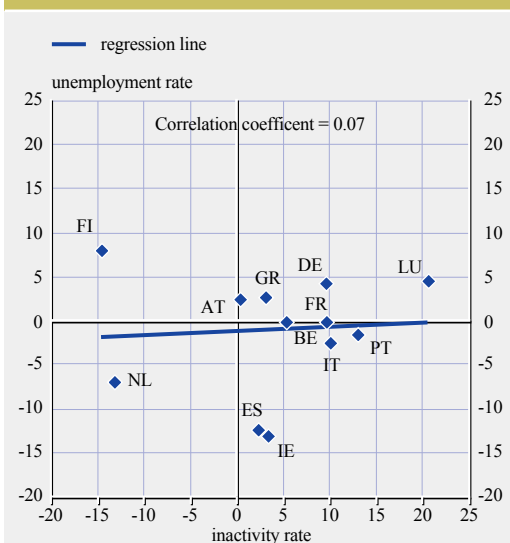
Sources: Eurostat (EU LFS) and ECB calculations.

Note: The change from 1983-94 to 1995-2007 refers to the change (in percentage points) between the average of the period 1983-1994 and the average of the period 1995-2007 in an attempt to take into account cyclical developments.

up looking for a job completely and are not in education. Country developments do not seem to support this view. Indeed, they show that there is no significant bivariate relationship between developments in unemployment

and inactivity rates. In other words, those countries experiencing the highest declines in the unemployment rate have not recorded significant increases in the inactivity rate (see Chart 5). However, as the chart shows, the inactivity rate of young persons has increased in most euro area countries when comparing the periods 1983-1994 and 1995-2007. In countries such as Portugal, Spain, Italy and Ireland, this trend has been accompanied by a decline in unemployment, although this has differed markedly across countries.

**Chart 5 Inactivity versus unemployment rate developments for euro area countries**



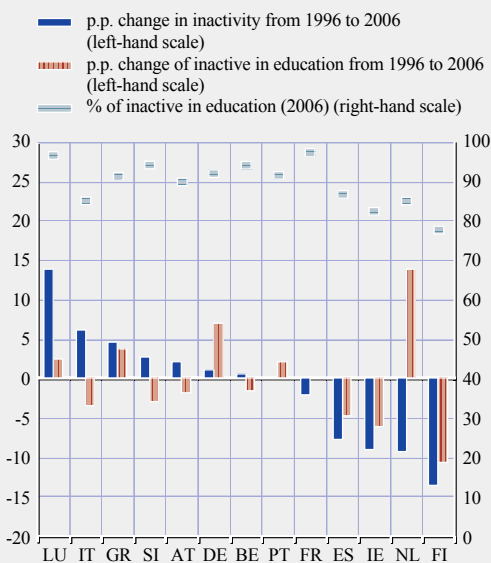
Sources: Eurostat (EU LFS) and ECB calculations.  
Note: Dots reflect changes in inactivity and unemployment rates over the periods 1983-94 and 1995-2007.

What is behind the inactivity developments among young persons in euro area countries? Owing to the limited availability of data on the reasons for being inactive, this question can only be addressed for the period 1996-2006. As Chart 6 shows, in 2006, the vast majority of young persons were inactive because they were in education. This share was highest for France and Luxembourg, with 97.1% and 96.6% respectively, and was the lowest in Finland (77.4%).

The chart also shows that developments in inactivity are closely linked with developments in education participation. For example, in

**Chart 6 Inactivity and education in the young population, 1996-2006**

(inactive as a percentage of the population)



Sources: Eurostat (EU LFS) and ECB calculations.

Luxembourg, Greece and Germany, the increase in the inactivity rate among young persons between 1996 and 2006 was accompanied by a growing share of young persons being inactive because they participated in education. At the same time, in Spain, Ireland and Finland, the decline in the inactivity rate over the same period was accompanied by a decline in the share of young persons being inactive because they were participating in education. By contrast, in Italy and Slovenia, the increase in the inactivity rate of young persons was accompanied by a decline in the share of young persons participating in education.

An analysis of unemployment and inactivity rates points up two “extreme” cases. On the positive side, the Netherlands recorded, between 1996 and 2006, a decline in both unemployment and inactivity rates, as well as an increase in the share of young inactive persons participating in education. On the negative side, Austria recorded an increase both in the unemployment and, to a lesser extent, the inactivity rate, and the share of young inactive

people in education declined. This means that the observed increase in unemployment was accompanied by a growing share of young persons becoming “truly” inactive.

### 3 DETERMINANTS OF YOUTH UNEMPLOYMENT: A SURVEY OF THE LITERATURE AND SOME STYLISED FACTS FOR THE EURO AREA

Economists' interest in the causes of youth unemployment dates back a long time, with systematic research on the youth labour market, for example by the NBER, starting at the beginning of the 1980s. The analysis of youth unemployment generally differs according to the explanatory factors considered, the country panel and the time horizon analysed, as well as the regression techniques chosen. Some of the main explanatory variables considered include changes in the state of the economy, changes in relative population sizes of young people and prime age persons, labour market institutions, as well as education and training systems. The following review of the literature on youth unemployment briefly reviews the main results on these aspects emerging from the literature and presents some stylised facts for the euro area.

#### DEMOGRAPHIC TRENDS

Several studies on youth unemployment have collected evidence on the impact that changes in the population age structure have on the labour market success of young people. The hypothesis tested is that decreases (increases)

in relative cohort sizes, i.e. the ratio of young to prime age persons in the population, should improve (worsen) the labour market prospects of young relative to prime age persons, as long as young and prime age workers are not perfect substitutes. Summarising the literature on the impact of changes in the population age structure on the youth labour market, it appears that an increase in the cohort size of young persons relative to prime age persons has an adverse effect on unemployment, employment and wages among young persons in a number of countries (see Korenman and Neumark (2000) for an extensive review of the literature on cohort size and the youth labour market). The basic reasoning behind this is that, under the assumption that young and prime age workers are complements in the labour market in terms of skill endowments and qualifications, labour demand for both young and prime age workers is fixed at given prices. An increase in the size of the youth cohort relative to that of prime age workers would then tend to raise unemployment, reduce employment and put downward pressure on wages for young workers. In their own cross-country approach for OECD countries over the period 1970-1994, Korenman and Neumark (2000) find that large youth cohorts lead to increases in the unemployment rates among young people, with

**Table 8 Shares of youth and prime age population in the population of people aged 15 and over, 1983-2007**

	Share of youth population (15-24)			Share of youth population (15-24)		
	Level (%) 1983	Level (%) 2007	Change (p.p.) from 1983-2007	Level (%) 1983	Level (%) 2007	Change (p.p.) from 1983-2007
Belgium	16.9	12.7	-4.2	41.8	44.3	2.5
Germany	17.4	12.1	-5.4	43.2	43.8	0.6
Ireland	20.1	15.5	-4.5	39.0	46.9	7.9
Greece	14.8	11.3	-3.5	44.4	46.0	1.6
Spain	17.8	11.8	-6.0	38.3	48.5	10.1
France	15.3	13.3	-2.0	43.7	43.9	0.3
Italy	15.8	10.7	-5.1	42.3	45.6	3.3
Luxembourg	16.0	12.3	-3.7	43.7	48.4	4.7
Netherlands	17.9	12.9	-5.0	43.0	46.0	3.0
Austria	13.3	12.6	-0.7	47.5	46.1	-1.4
Portugal	16.6	12.2	-4.4	40.4	45.7	5.3
Slovenia	n.a.	12.8	n.a.	n.a.	46.0	n.a.
Finland	12.7	12.8	0.1	49.3	42.4	-6.9
Euro area	16.5	12.1	-4.4	42.5	45.2	2.7

Sources: Eurostat (EU LFS) and ECB calculations.



the elasticities ranging between 0.5 and 0.6. Nevertheless, for the time period considered, the authors find evidence for several countries that the youth “did poorly despite an increase in scarcity”, leading them to the conclusion that the effects of the cohort size have been counteracted, for example, by downturns in the business cycle, technological changes, and changes in the pattern of international trade that tended to be disadvantageous for young persons.

As regards the euro area, Table 8 shows that the share of young persons in the total population of the euro area has declined over the last two decades by 4.4 percentage points to 12.1%, while that of the prime age population has increased by 2.7 percentage points to 45.2%. The decline in the share of youth population was largest in Spain (6.0 percentage points) and smallest in Finland, where it remained broadly unchanged.

Chart 7 depicts the relationship between changes in relative cohort size and changes in relative unemployment rates among young to prime age persons over the period 1983-2007 in the euro area. It shows a high correlation between the decline in the unemployment rate among young persons relative to prime age persons and the steady fall in the size of

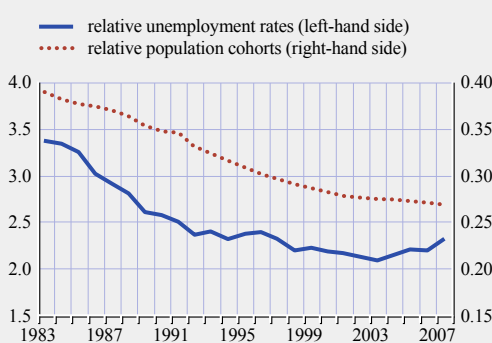
this population group relative to that of the prime age population group. In 1983 youth unemployment was three and a half times higher than prime age unemployment and the youth population made up roughly only a third of the prime age cohort. In 2007 youth unemployment was still more than double prime age unemployment, but its cohort size relative to prime ages had shrunk to around a quarter. Consequently, the absolute decline in the size of the youth cohort relative to that of prime age persons seems to have supported the decline in the youth unemployment rate over the last two decades.

### ECONOMIC ENVIRONMENT

Changes in youth unemployment are usually closely related to changes in prime age unemployment, which can be taken as a proxy for variations in the state of the economy. Youth unemployment tends to be more cyclically sensitive than prime age unemployment, with youth unemployment tending to increase more than prime age unemployment during periods of recession and to decline more quickly during economic upswings. Most studies tend to find aggregate economic activity to be a major determinant of the level of youth unemployment (see, for example, O’Higgins (1997) and the studies collected in Blanchflower and Freeman (2000)).

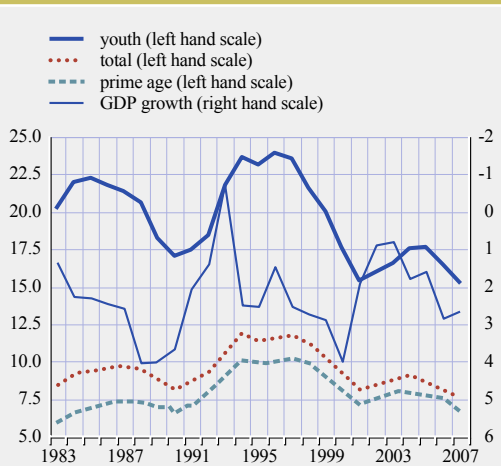
An initial look at the co-movements between the euro area unemployment rate according to age group and the economic cycle, measured by real GDP growth, highlights two facts. First, as expected, there seems to be a negative relationship between the overall unemployment rate and activity developments in the euro area, i.e. positive activity developments lead to a fall in the unemployment rate and, conversely, subdued real GDP growth rates translate into higher unemployment (see Chart 8). Second, the variability of the youth unemployment rate is much greater than that of the prime age unemployment rate, i.e. it is much more responsive to the economic cycle than the unemployment rate of prime age workers.

**Chart 7 Developments in relative unemployment rates and cohort sizes in the euro area, 1983-2007**



Sources: Eurostat (EU LFS) and ECB calculations.  
 Note: Relative unemployment rates (population cohorts) are measured as the quotient of the unemployment rates (cohort sizes) of the age group 15-24 over the age group 25-54.

**Chart 8 Euro area unemployment rates according to age group over the economic cycle, 1983-2007**

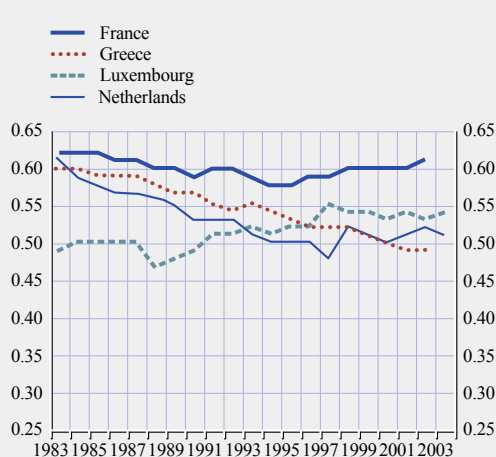
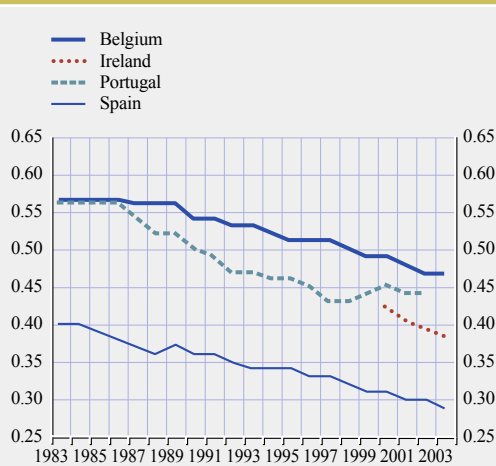


Sources: Eurostat (EU LFS) and ECB calculations.

### LABOUR MARKET INSTITUTIONS AND POLICIES

The labour market institutions that are often said to explain the level of and changes in youth unemployment include, inter alia, employment protection regulation, minimum wages and ALMPs. The OECD (1999), for example, finds employment protection regulation to have negative employment effects, particularly for young workers.<sup>5</sup> Generally, a high level of employment protection legislation may be detrimental to young persons for several reasons. First, high firing costs tend to discourage firms from taking more people on during upswings, as it would then be too expensive to dismiss them again when the economic situation is not so favourable. A strict level of employment protection regulation thus tends to lead employers to fill vacancies only with well-suited employees, as dismissals are costly. This might often prove to be disadvantageous for young and inexperienced workers, as firms have little knowledge about their ability and skills. Second, there tends to be fewer firings during economic downturns, thus reducing inflows into unemployment. However, if firings are regarded as unavoidable, firms tend to dismiss a larger number of young workers than prime age workers as redundancy payments increase with job tenure. As indicated in the previous section, one way for firms to avoid the burden of high

**Chart 9 Developments in minimum wages relative to median wages, 1983-2003**



Sources: OECD and ECB calculations.

firing costs linked to permanent contracts when they are faced with having to cut staff, is to use more temporary contracts.

As regards minimum wages, some econometric studies have tested whether or not the induced wage floor impedes the employment of young workers (see Neumark and Wascher (2004), for example, for a survey of several studies). As Table 9 shows, eight euro area countries have statutory minimum wages, ranging from a

5 The study finds that employment protection regulation has little effect on overall unemployment. Instead, it might have an impact on the demographic decomposition of unemployment, where unemployment is found to be lower for prime-age men, but higher for young workers in particular.

Table 9 Statutory minimum wages and special rates for young workers in 2007, monthly pay

	2007		Special minimum wage rates for young workers	
	Minimum wage rates (in euro)*	PPP adjusted	% of adult rate	applicable to
Belgium	1.234,21	1398.64	94	workers aged 20
			88	workers aged 19
			82	workers aged 18
			76	workers aged 17
			70	workers aged 16 and younger
Greece	625,97 <sup>1)2)</sup>	876.32		-
Spain	570,0 <sup>1)</sup>	735.48		-
France	1.254,28 <sup>3)</sup>	1399.80		-
Ireland	1.438.67	1410.45	90	workers aged under 18
				workers aged over 18 in final third of a course*
			80	workers aged 18 and above in first year of employment
				workers older than 18 in second third of a course*
			75	workers aged over 18 in first third of a course*
Luxembourg	1.570,28 <sup>4)</sup>	1588.78	70	workers aged 18 and over in second year of employment
			90	workers aged 17
			75	workers aged between 15 and 17
			60	workers aged 15
				workers aged 22
Netherlands	1.284,60	1413.24	85	workers aged 21
			72.5	workers aged 20
			61.5	workers aged 19
			52.5	workers aged 18
			45.5	workers aged 18
			39.5	workers aged 17
			34.5	workers aged 16
			30	workers aged 15
				workers aged under 18
			Portugal	403,00 <sup>1)</sup>

Source: EIRO.

+ ) Refers to March 2007

\* ) Course refers to a course of authorised training or study.

1) White-collar workers only. Workers normally entitled to 14 monthly payments per year.

2) Different rates apply to blue and white collar workers and vary by length of service and marital status.

3) Based on statutory 35-hour week.

4) Unskilled workers only.

monthly pay of 403 euros in Spain to 1570 euros in Luxembourg (not adjusted for purchasing power parities).

Chart 9 indicates that minimum wages relative to median wages tended to decline between 1983 and 2003 in most countries, with the exception of Luxembourg, where this ratio increased, and France, where it remained broadly unchanged.

Pereira (2003) analyses the strong increase in minimum wages for 18 and 19 year olds in Portugal in 1987 and finds that an increase in minimum wages, inter alia, has a negative impact on employment among this age group compared with that of older workers and leads firms to substitute these workers for young adult workers.<sup>6</sup> In a study of 17 OECD countries over

the period 1975-2000, Neumark and Wascher (2004) find that increases in minimum wages tend to lead to employment losses among young persons. However, they find the negative employment effects to be smaller in countries that have implemented sub-minimum wage provisions for young persons. As Table 9 indicates, these provisions exist to varying extents in Belgium, Ireland, Luxembourg, the Netherlands and Portugal (see Box 1 for a discussion on the effects of sub-minimum wage regulations in the Netherlands).

Generally, minimum wage figures are not necessarily indicative of the level of labour

6 By contrast, Card and Krueger (1994, 2000) do not find that a rise in minimum wages has any systematic effect on employment.

costs incurred by employers for young people. On the one hand, collectively agreed wages may be higher than statutory minimum wages for young persons. On the other hand, as in France, for example, reductions in employer social security contributions for young persons

effectively reduce the labour costs of young workers. In several other euro area countries, where statutory minimum wages are not in place, collectively bargained wages act as a kind of minimum wage, as collective bargaining coverage rates are rather high.

### Box I

#### THE YOUTH LABOUR MARKET IN THE NETHERLANDS: THE ROLE OF SUB-MINIMUM WAGES

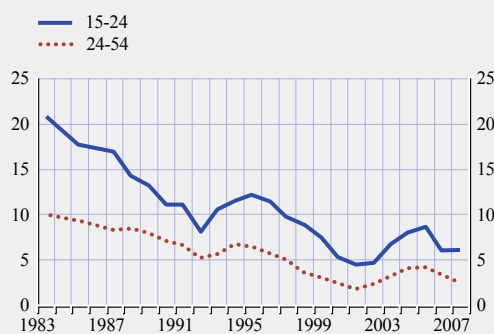
The labour market performance of young persons in the Netherlands is among the best in the euro area. In 2007 the Dutch youth unemployment rate was 6.1%, the lowest in the euro area and 9.2 percentage points below the euro area average. At the same time, compared with 1983, the Dutch youth unemployment rate declined much more sharply than the prime age unemployment rate (see Chart).

As shown in Table 9, the Netherlands has a highly differentiated system of sub-minimum wages for young persons, which is unique among the euro area countries. There has been a statutory minimum wage since 1969 and the sliding scale of minimum wages was introduced in 1974 (see OECD (2008)). According to this system, minimum wages for young persons range from 30% of the adult minimum wage for 15 year olds to 85% of the adult minimum wage for persons aged 22. Consequently, the sub-minimum wages for young persons in the Netherlands are much lower than those in other euro area countries where such regulations apply. At the same time, 22 years, the maximum age for which these sub-minimum wage regulations apply, is higher than in the other countries.

With the introduction of sub-minimum wages for young persons, the Dutch government intended to positively affect the labour demand for young people, but at the same time encourage young people to stay in education. Following the Wassenaar Agreement in 1983, where emphasis was put on moderating real wage increases, statutory minimum wages in real terms declined significantly. According to Salverda et al. (2008), as quoted by OECD (2008), in 2005 the youth minimum wage had roughly 40% less purchasing power on average than in 1979, while the wage for young persons had lost just 10% on average. This relates to the fact that the lower level of statutory minimum wages for young persons in the Netherlands is, to some extent, compensated by collective wage agreements, which foresee wages for young persons that are on average 13% to 21% higher than those envisaged by the minimum wage law (see OECD (2008)).

#### Prime age and youth unemployment in the Netherlands, 1983-2007

(as a percentage of the labour force)



Sources: Eurostat (EU LFS) and ECB calculations.

The available empirical evidence for the Netherlands suggests that relatively low minimum wages for young persons, and reductions therein, with respect to wages for adult workers have a positive effect on their employment possibilities, and thus tend to reduce the risk of them being unemployed (see van Soest (1994) and Ryan (2001) for early evidence). This may relate to both young persons replacing adult workers and the creation of new jobs for young persons. In this respect, Meijers and Te Riele (2004) point to the fact that over the last decade the Dutch government has tried to improve the labour market position of young persons by creating subsidised jobs for young persons in the public sector, which are usually paid the statutory minimum wage. At the same time, reductions in Dutch youth minimum wages relative to those of adults seem to have boosted the participation of young persons in education (see OECD (2008) for a discussion of the related literature).

Apart from sub-minimum wage regulations for young persons, there have been several other policy initiatives in the Netherlands aimed at boosting the employability of young persons. In 2003 the Dutch government adopted a Youth Unemployment Action Plan, set a youth unemployment target of no more than double the overall unemployment rate and implemented a Taskforce on Unemployment that was in place until 2007. This Taskforce provided several initiatives for improving the school-to-work transition and young persons' educational attainment among other things. In 2007 the government raised the number of initiatives to reduce the incidence of young persons leaving school early and set the objective of halving the number of early school dropouts by 2012. Furthermore, the government is generally encouraging social partners to pay low-skilled young persons the statutory minimum wage in order to increase their employment chances. All these measures aimed at reducing youth unemployment and increasing the employability of young persons seems to have contributed to an overall favourable labour market position for young persons in the Netherlands.

Finally, regarding ALMPs, the literature is rather inconclusive on their impact on young persons' employment prospects (for an overview, Heckman et al. (1999) and Kluge (2006)). ALMPs entail (1) training programmes; (2) measures aimed at increasing working incentives or labour demand, for example, wage subsidies; (3) public employment programmes; and (4) job-search assistance, as well as benefit sanctions. Spending on ALMPs varies greatly across euro area countries, but has no bearing on the relative effectiveness of countries' policies. According to OECD (2007a), in 2005, the highest spending on ALMPs was observed in the Netherlands (1.33% of GDP), followed by Belgium (1.08% of GDP) and Germany (0.97% of GDP), and the lowest was observed in Italy and Luxembourg (around 0.5% of GDP). Kluge (2006) interprets the available empirical evidence, i.e. the absence of clear positive employment effects of ALMPs for young

persons, by indicating that "young people appear to be particularly hard to assist".

A growing number of studies on the causes of youth unemployment have focused on the interplay of several explanatory factors. For example, Korenman and Neumark (2000) tested the extent to which labour market institutions affect the ability of youth cohorts to be absorbed into the labour market. They find evidence, albeit statistically weak, "that greater centralisation of wage setting in some European labour markets, and generous support for the unemployed, may increase the response of youth unemployment and employment rates to cohort size fluctuation", i.e. changes in relative cohort sizes. Bertola, Blau and Kahn (2002) find for 17 OECD countries over the period 1960-1996, inter alia, that the "involvement of unions in wage-setting significantly decreases the employment rate of young workers relative to prime-age men". Neumark and Wascher

(2004) find “that more restrictive labour standards and higher union coverage strengthen the disemployment effects of minimum wages, while employment protection laws and active labour market policies designed to bring unemployed individuals into the work force help to offset these effects.” Some studies have tried to account for the role played by the interaction of macroeconomic shocks and labour market institutions in explaining cross-country youth unemployment and employment patterns.<sup>7</sup> The interplay of demographic shifts, labour market institutions and macroeconomic shocks as an explanation for youth unemployment is considered by Jimeno and Rodriguez-Palenzuela (2002) for a set of OECD countries from the 1970s onwards. They find, *inter alia*, that young workers “tend to play the role of a buffer to absorb macroeconomic shocks” and that institutional rigidities tend to increase youth unemployment rates.

### EDUCATION

Studies on the role of education in unemployment also help to explain developments in youth unemployment, although in a more indirect way. In this respect, some of the literature has focused on the observation that the unemployment rate of less educated workers tends to be higher than

the unemployment rate of more educated workers (see Box 2 on links between youth unemployment and educational attainment). One explanation for these unemployment differentials is the existence of a degree of mismatch between the demand for and supply of education, with an excess demand for more highly educated workers, in particular.<sup>8</sup>

<sup>7</sup> In addressing demographic groups instead of the workforce in general, this analysis complements work undertaken by Blanchard and Wolfers (2000), which finds that the interaction of macroeconomic shocks and institutional labour market rigidities explains increases in European unemployment over time, as well as the heterogeneity in unemployment across European countries. Their results indicate that, whereas cyclical and structural shocks contribute to the general increase in unemployment, the interaction of these changes with different national labour market institutions seems to explain some of the heterogeneity of unemployment trends.

<sup>8</sup> The amount of literature on the mismatch is large and has grown since the mid-1980s, with good surveys and cross-national studies in Padoa-Schioppa (1991) and Layard et al. (1991). It concerns not only educational/occupational mismatch, but also geographical and gender mismatch. The consensus established in the early 1990s is that the mismatch has not been one of the causes of the increase in European unemployment over the last three decades. It has been, however, a source of friction leading to a higher “natural” rate of unemployment. The natural rate can be decomposed into a part that is the level of aggregate unemployment if all areas (education category, occupation, etc...) were equal, plus a part resulting from the dispersion of unemployment according to sub-category. The latter part can be up to a quarter or a fifth of total unemployment.

### Box 2

#### LINKS BETWEEN YOUTH UNEMPLOYMENT AND EDUCATIONAL ATTAINMENT

Participation in education and training can affect the extent to which young persons are registered unemployed through various channels. To the extent that a rising proportion of young persons is withdrawing from the labour force in order to participate in education, youth unemployment should tend to be lower.<sup>1</sup> To the extent that young persons, who are still in education, need to earn an income to finance their studies, unemployment tends to rise when they register themselves unemployed while seeking job opportunities. The level of education attained influences young persons’ risk of becoming unemployed. Depending on the educational structure of the youth population, as well as the demand for young workers, this may affect the overall level of youth unemployment.

<sup>1</sup> This would also hold true for the participation of young persons in ALMPs. However, data availability is limited in this respect.



Percentage of youth population according to age group and work status, 2005

Country	Age group	Students in workstudy programmes <sup>1</sup>	In education				Not in education			
			Employed	Unemployed	Not in the labour force	Subtotal	Employed	Unemployed	Not in the labour force	Subtotal
Belgium	15-19	1.4	2.5	0.4	85.8	90.1	3.7	1.8	4.4	9.9
	20-24	1.1	4.2	0.9	31.9	38.1	43.6	11.0	7.3	61.9
Germany	15-19	16.5	4.8	1.6	70.0	92.9	2.7	2.4	2.0	7.1
	20-24	13.3	7.8	0.9	22.2	44.2	37.1	10.3	8.4	55.8
Ireland	15-19	a	9.6	b	72.4	82.5	13.1	2.2	2.2	17.5
	20-24	a	6.8	b	20.6	27.8	60.0	4.9	7.2	72.2
Greece	15-19	a	1.5	b	82.5	84.5	5.7	2.8	7.0	15.5
	20-24	a	3.2	b	38.3	42.6	37.3	11.8	8.3	57.4
Spain	15-19	a	4.2	2.2	75.4	81.8	9.7	4.1	4.4	18.2
	20-24	a	12.9	3.9	27.6	44.3	40.2	8.9	6.6	55.7
France	15-19	5.6	1.9	0.5	82.8	90.8	3.0	3.2	3.0	9.2
	20-24	4.9	5.3	1.2	36.0	47.4	36.1	10.6	5.9	52.6
Italy	15-19	b	1.1	0.8	79.9	81.1	7.0	3.9	7.2	18.2
	20-24	a	3.4	1.1	33.7	38.6	37.3	10.5	13.6	61.4
Luxembourg	15-19	a	1.0	b	91.2	93.4	4.4	b	b	6.6
	20-24	a	5.0	b	51.7	57.9	43.3	6.1	3.2	52.6
Netherlands	15-19	a	43.0	5.6	40.5	89.2	7.0	1.3	2.6	10.8
	20-24	a	32.1	2.3	14.7	49.1	41.8	3.9	5.2	50.9
Austria	15-19	23.8	2.0	b	57.8	84.4	8.7	4.2	2.7	15.6
	20-24	1.7	9.7	b	18.0	30.4	57.2	4.6	7.8	69.6
Portugal	15-19	a	1.4	b	77.5	79.3	12.2	3.1	5.3	20.7
	20-24	a	5.5	0.7	31.2	37.4	48.4	8.8	5.3	62.6
Finland	15-19	a	10.9	5.2	74.1	90.2	4.5	2.0	3.3	9.8
	20-24	a	18.6	5.5	28.7	52.8	34.1	7.0	6.1	47.2
Euro area	15-19	11.8	7.2	1.9	73.8	87.1	6.5	2.9	3.9	12.9
	20-24	5.3	9.0	1.7	29.5	42.0	43.4	8.3	7.4	59.0

Source: OECD (2007b).

Notes: Arithmetic averages for the euro area.

1) Students in work-study programmes are considered to be both in education and employed, irrespective of their labour market status according to the ILO definition.

a) Data are not applicable because the category does not apply.

b) There are too few observations to provide reliable estimates (i.e. there are fewer than 3% of students for this cell or too few schools for valid references).

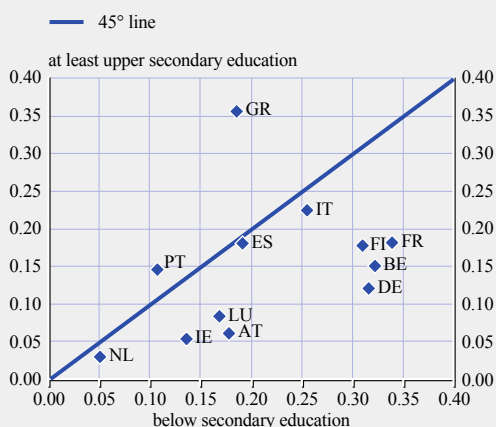
As the Table above shows, in 2005, 87.1% of those aged 15 to 19 in the euro area were still in education, compared with 42% of young adults. At the same time, only a fraction (just below 2%) of both teenagers and young adults were in education and registered unemployed. Furthermore, 3.9% of euro area teenagers and a large share (7.4%) of young persons were not in education and not in the labour force, which points up a high level of young school dropouts and a sizeable share of young persons losing attachment to the labour market.

Looking now more closely at young persons who have already completed their education, Chart A shows that, in some countries, the labour market situation of those with a higher level of education is either comparable or even worse than that of those with a comparably lower level of education. In Greece, for example, the unemployment rate among 20-24 year olds who have attained at least upper secondary education is higher than that among those whose level of education is below secondary. The same applies to Portugal, albeit to a lesser extent.

Chart B depicts the relationship between the unemployment rates of those aged 20 to 24 who are not in education and have a level of education below upper secondary compared with those with at least upper secondary education and the relative cohort sizes of these groups. It is supposed to

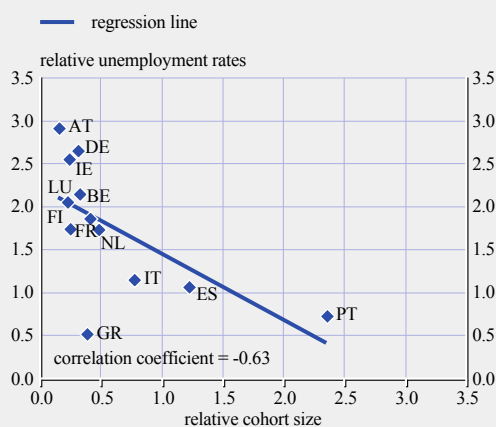
**Chart A Young unemployed not in education by level of educational attainment, 2003**

(unemployed aged 20 to 24 as a percentage of the labour force aged 20 to 24)



Sources: OECD and ECB calculations.

**Chart B Relationship between relative unemployment rates and relative cohort size of 20-24 year olds not in education, 2003**



Sources: OECD and ECB calculations.

Note: Relative unemployment rates are measured as the unemployment rates of those aged 20 to 24 who are not in education and have a level of education below upper secondary divided by those with at least upper secondary education. The relative cohort size is measured as the percentage of those aged 20 to 24 who are not in education and have a level of education below upper secondary divided by the percentage of those with at least upper secondary education.

give an impression of the extent to which the pure abundance of relatively low-skilled persons increases this group's risks of being unemployed across euro area countries. There seems to be a tendency for the relative unemployment rates of young adults with below upper secondary education to decline with the relative cohort size. For example, in Germany, Ireland and Austria, which have a relatively small share of persons with just below upper secondary education, the unemployment risk of this group is two and a half times higher than that of those who have attained at least upper secondary education. This seems to indicate that in these euro area countries, a relative shortage of low-skilled people does not necessarily improve the labour market prospects of this group. Consequently, there seem to be other mechanisms at work that explain the level of unemployment among young low-skilled persons. By contrast, in Portugal, which has by far the largest relative cohort size of young adults with below upper secondary education, the risk of being unemployed among this group is comparable to that among those with at least upper secondary education. Consequently, these findings indicate differences in the countries' comparative advantages in the production of goods and services. Portugal, on the one hand, which is relatively richly endowed with low-skilled labour, has an advantage in the production of goods and services that uses this kind of labour relatively intensively, thus supporting the integration of low-skilled workers into the labour market. Germany and Austria, on the other hand, are relatively richly endowed with high-skilled labour, which means they have an advantage in the production of goods and services that uses this kind of labour intensively. This shows that the malfunctioning of the labour market is particularly detrimental to the lower-skilled young workers in these countries.

Another part of the literature attempts, on the contrary, to relate labour market developments over the past few decades, especially in Europe, to an over-education phenomenon. This view states that the number of skilled jobs has not increased as quickly as the supply of educated workers, and that high-skilled workers must either accept jobs for which they are over-qualified or face unemployment. They thus compete with low-skilled workers. In an imperfect labour market, employers prefer more skilled workers, even for low-skilled positions, which results in mass unemployment among the less educated workers (see Duncan and Hoffman (1981)).<sup>9</sup> In a different approach to measuring the degree of over-education in an economy and its role in explaining trends in youth unemployment, Quintini and Martin (2006) classify as over-educated those who (1) have completed tertiary education but are working in an occupation that requires a medium or low level of qualification and (2) have completed upper secondary education but are working in an occupation that requires a low level of qualification. For this, they define a set of jobs and the schooling needed to perform them. For the 22 countries analysed, they find that the problem of over-education increased in 15 countries between 1995 and 2005 (for the euro area notably in Luxembourg, Austria and France). Portugal was found to have a particularly low rate of over-education according to their measure.

9 As surveyed by Hartog (2000), there are three basic methodological strategies in these studies. One strand considers the level of qualification required in each type of job and investigates, by using the expertise of professional job analysts, whether workers employed in these jobs are over- or under-qualified. A second strand is based on the self-assessment by workers of their qualification for the job they hold. A third strand considers the distribution among the employed population of qualifications according to type of occupation: the mode of the distribution of skills is considered as the right level of qualification, above which there is over-education and below which there is under-education.

#### 4 DETERMINANTS OF YOUTH UNEMPLOYMENT IN EURO AREA COUNTRIES: SOME EVIDENCE

Having described a range of potential explanatory factors for youth unemployment that are prominent in the literature, the following analysis now uses these potential determinants of youth unemployment to gather some cross-country empirical evidence. In so doing, this approach complements the existing literature by focusing on the euro area countries in particular and the period 1985-2004 (for which data are available). To enhance the variability in the sample, non-euro area countries are also incorporated. These include the United Kingdom, the United States, Canada, Australia, Denmark, Sweden, Norway and Switzerland. Furthermore, compared with previous studies on youth unemployment, such as Jimeno and Rodriguez-Palenzuela (2002), we do not include the role of macroeconomic shocks as explanatory variables, but explore the role of other factors, such as education. It is, however, just a first step towards detecting possible regularities between developments in youth unemployment and single explanatory factors.

The analysis is done in two steps. The first step relates cross-country youth unemployment rates to three groups of variables: (i) demographic trends; (ii) the economic environment; and (iii) labour market institutions and policies. Demographic trends are captured by the share of the youth population (15 to 24) in the total working age population (15 to 64). In line with the previous section, two variables are used for the economic environment, namely the unemployment rate and real GDP growth. In particular, regarding the unemployment rate, we focus on prime age unemployment rate of males, which is expected to be a good proxy of the cycle in the labour market and, at the same time, less affected by trend developments in the unemployment rate compared with other groups and therefore less correlated with some of the institutional variables used in the regressions. In order to investigate the role that the trend increase in inactivity rates in some countries, mainly linked to education participation,

may have had in the evolution of youth unemployment, we have also included inactivity rates as an explanatory variable. Moreover, in order to capture the impact that the increasing importance of services in the economy may have on reducing youth unemployment by increasing employment opportunities for young workers (see Section 2.3), the share of services employment in total employment has also been included as explanatory variable. Finally, regarding labour market institutions and policies, a large set of variables is used, which is explained in detail in Annex 2. The labour market institutions accounted for include those discussed in the previous section, namely employment protection legislation, minimum wages, wage bargaining coordination as well as ALMPs.

In the second step, the country fixed effects obtained in the first approach are related to educational variables. These include (i) the share of students in upper secondary education following vocational programmes; (ii) the average number of years of education of persons aged 25 and above; (iii) the share of the young population not in school; and (iv) the mean scores of the OECD PISA results relating to tests in mathematics (see Annex 3 for details). The main reason for breaking the analysis into two parts is the lack of time varying information on variables capturing educational attainment. Therefore, the first set of regressions makes full use of country and time variation and the second set concentrates on trying to relate the remaining country effects to specific characteristics of the educational systems.

The results of the first part of the regression exercise are summarised in Table 10. The first two columns show that, as regards demographic trends, there is a positive relationship between the share of young people in the total population and the youth unemployment rate. Consequently, the growing shortage of young persons in an ageing population contributes to reducing the risk of being unemployed. As for the economic environment, measured by means of the male prime age unemployment

rate, it is also positively correlated with the youth unemployment rate, i.e. if the economic situation deteriorates, the youth unemployment rate increases. As expected, the coefficient is greater than 1, which means that the youth unemployment rate is comparatively more volatile than the male prime age unemployment rate. In Column 3, it is shown that the counter-cyclicality of the youth unemployment rate remains when the male prime age unemployment rate is substituted by developments in real GDP, which is lagged by one period to take account of the fact that labour market developments tend to react to economic activity with a lag. In this case, ALMPs are dropped as the variable turned out to be insignificant.

As regards inactivity developments, which are introduced in Column 4, the main technical issue

is the fact that both decisions, being inactive or participating in the labour market (which may lead to unemployment during job search), are interrelated. As the aim is to find relevant cross-correlations rather than pure causality, we believe that the inclusion of inactivity is essential. Moreover, partly to avoid endogeneity problems, we have used the lag of the youth inactivity rate. The results clarify the lack of a bivariate correlation discussed at the end of Section 2, and indicate that the overall increase in youth inactivity is significantly correlated with the overall decline in youth unemployment. In other words, education has been an alternative to unemployment in a number of countries.

Turning to labour market institutions and policies, in line with the literature, robust results across the regression scenarios show that higher

Table 10 Panel data estimates

Regression scenarios for the youth unemployment rate						
	Scenario (1)	Scenario (2)	Scenario (3)	Scenario (4)	Scenario (5)	Scenario (6)
<b>Demographic trends</b>						
Share of youth population <sub>t</sub>	68.36 (4.64)	70.85 (5.73)	155.67 (9.00)	63.33 (5.48)	34.53 (1.90)	70.54 (5.73)
<b>Economic environment</b>						
Male unemployment rate (25 to 54) <sub>t</sub>	1.91 (24.72)	1.89 (26.73)		1.91 (29.04)	1.80 (15.54)	1.93 (28.93)
Real GDP growth <sub>t-1</sub>			-1.04 (8.67)			
<b>The role of inactivity</b>						
Youth inactivity rate <sub>t-1</sub>				-0.15 (6.02)	-0.09 (2.31)	-0.14 (5.08)
<b>The role of the services sector</b>						
Share of services employment in total employment <sub>t</sub>						-20.15 (1.64)
<b>Labour market institutions and policies</b>						
Employment protection <sub>t</sub>	1.56 (2.99)	1.01 (3.07)	1.63 (3.55)	1.07 (3.49)	1.43 (4.04)	1.01 (3.29)
ALMPs for young persons <sub>t</sub>	-11.09 (5.01)	-10.77 (5.05)		-10.89 (5.50)	-6.36 (2.56)	-10.69 (5.41)
Coordination in wage bargaining <sub>t</sub>	0.25 (0.63)					
Minimum wage <sub>t</sub>					10.67 (2.10)	
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	247	261	360	261	140	261
DW	0.73	0.72	0.49	0.85	0.71	0.86
R-squared	0.96	0.96	0.87	0.97	0.98	0.97

Note: Ordinary least square (OLS) estimates. Countries included: Belgium, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom, Norway, Switzerland, Denmark, Australia, United States, and Canada. Sample period: 1985-2004.

employment protection implies a higher youth unemployment rate, while ALMPs tend to reduce it. At the same time, wage bargaining coordination is not found to be significant.<sup>10</sup> Finally, minimum wages, the incorporation of which significantly reduces the number of countries and observations, as not all countries considered have statutory minimum wages, have the expected positive impact on youth unemployment (see Column 5).

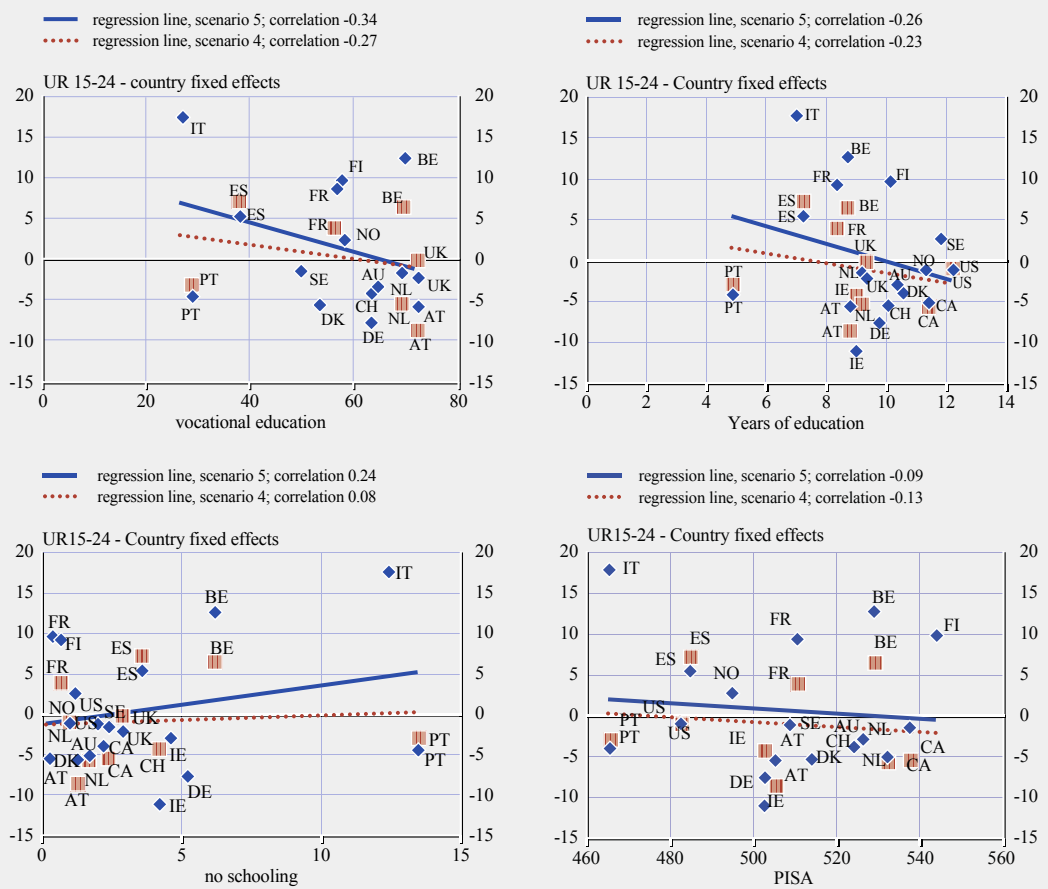
Furthermore, Column 6 tries to take account of the increasing importance of the services sector in explaining labour market outcomes for young persons. Although the level of significance is below that shown by other variables, the results

indicate that an increasing share of services employment in total employment is helping to reduce unemployment among young persons. This may be due to the fact that the kind of education attained by recent youth cohorts increasingly matches labour demand in the services sector, both for lower-paid young teenagers, as well as for higher paid, more educated young adults.

Finally, in the second part of the exercise, country fixed effects derived from our preferred

<sup>10</sup> Unemployment benefit replacement rates and union density, which have been found in the literature to be relevant in explaining overall unemployment differentials, were also included as explanatory variables, but turned out to be insignificant and are not reported.

**Chart 10 Cross-correlations between the youth unemployment rate country fixed effects and educational variables**



Note: Belgium (BE), Germany (DE), Ireland (IE), Spain (ES), France (FR), Italy (IT), Luxembourg (LU), Netherlands (NL), Austria (AT), Portugal (PT), Finland (FI), Sweden (SE), United Kingdom (UK), Norway (NO), Switzerland (CH), Denmark (DK), Australia (AU), United States (US) and Canada (CA). Country fixed effects derived from Scenarios 4 and 5 in Table 10.



scenarios, which are presented in Columns 5 and 6, are related to some available educational variables. Fixed effects are linked to the share of students with upper secondary education following vocational training, the average number of years of education, the share of the young population not in school and mathematics test results from the PISA study. We are interested here in identifying bivariate correlations due to the limited number of observations.

Chart 10 shows each of these variables against the youth unemployment rate country fixed effects. The correlations, albeit small, point in the expected direction. Indeed, they seem to indicate that the number of years of education, the share of the young population with upper secondary education following vocational training and, to a lesser extent, high scores in the PISA study are associated with lower youth unemployment rates, while the share of the young population not in school is positively correlated with the unemployment rate. However, these correlations between the country fixed effects and the education systems should be viewed as indicative only, as a simple correlation analysis cannot capture the complex relationship between educational systems and labour market outcomes.

All in all, the exercise presented in this section seems to confirm that country differences in the youth unemployment rate and its developments are the result of a combination of factors, including the economic environment, demographic trends and the labour market institutional framework, but may also be the result of differences in educational systems and their outcomes. These results are broadly in line with the existing literature.

## 5 CONCLUDING REMARKS

This paper reviews the development of youth unemployment across euro area countries over the last two decades and analyses some factors that may affect youth unemployment trends, including demographic trends, the economic environment and the development of the services sector, relevant labour market institutions and policies, and education.

In short, it is shown that youth unemployment in the euro area in 2007 was more than double unemployment among prime age workers aged 25 to 54, 15.3% and 6.6% respectively, compared with 1983, when the youth unemployment rate was more than three times higher than the unemployment rate of prime age persons. This implies that the relative labour market position of young workers has improved over the last two decades. However, youth unemployment actually increased in five euro area countries. An analysis of age groups shows that unemployment tends to decline with age. Just as euro area youth unemployment is higher than prime age unemployment, unemployment among teenagers (aged 15 to 19) is higher than among young adults (aged 20 to 24). Long-term unemployment can significantly affect even young people in the labour force. Indeed, for the euro area as a whole, the share of young unemployed persons aged 15 to 24, who had been unemployed for more than a year, amounted to 27% in 2007. However, the share of long-term youth unemployment in total youth unemployment declined significantly and more quickly than that of prime age workers. Furthermore, the probability of a young person being unemployed tends to decline with the level of education attained and, over the last two decades, declined most significantly for young persons with tertiary education. However, in some countries, there are indications of a deterioration in the relative labour market position of young high-skilled persons.

As regards the main factors driving youth unemployment, it turns out that particularly high levels of employment protection legislation,

which may discourage the hiring of young workers, and the level of minimum wages tend to increase youth unemployment. By contrast, positive cyclical developments, a decline in the share of young people in the population, the trend increase in the share of services sector employment in total employment and ALMPs targeted at this group tend to help reduce the youth unemployment rate. At the same time, the increase in inactivity, due to more enrolment in education, is linked to the decline in youth unemployment. As regards the impact of educational systems, although the link with youth unemployment is less robust, it appears that the number of years of education, the share of the young population with vocational training and, to a lesser extent, the scores in the PISA study are correlated with lower youth unemployment rates, while the share of the young population not in school is positively correlated with the unemployment rate.

Despite a recent decline in youth unemployment, stemming partly from the flexibility gains in euro area labour markets, future economic policies should aim to improve the employability of young persons to further reduce youth unemployment. This implies a further adjustment of those labour market institutions, such as employment protection legislation and insufficiently flexible working time arrangements, which may constitute a barrier to young persons' employment opportunities. The fact that several euro area countries have lowered the level of employment protection legislation on temporary employment contracts may have helped the labour market chances of young persons. In this respect, Blanchard and Landier (2002) and OECD (2006) point out that this may give rise to a dual labour market with lower incentives for employers to invest in their young employees' human capital.

Generally, it is important that young people achieve a high level of education, particularly in the light of the growing number of technological advances. Although policies aimed at raising the general level of education will not necessarily reduce youth unemployment straight away, in

the longer run, the existence of a larger pool of educated workers may encourage firms to create more positions for high-skilled workers, with supply thus creating its own demand.<sup>11</sup> Consequently, a positive shift in the supply of education may have temporary adverse effects in countries where labour demand adjusts only slowly to supply, but after a few years, it may result in a general improvement in the economy – higher productivity and higher employment.<sup>12</sup> At the same time, there will always be young persons in the labour market who attain only a relatively low level of skills. In this respect, the analysis has shown that, across euro area countries, young persons with low skills are more likely to become unemployed in those euro area countries that, compared with others, have a relative abundance of high-skilled labour, i.e. where lower-skilled labour is relatively scarce. One may therefore conjecture that, in these countries, young low-skilled persons are particularly affected by malfunctioning labour market institutions.

As youth unemployment has several features that are country-specific, each country must identify the relevant underlying sources of youth unemployment and react accordingly. The preceding analysis indicates that governments can make a decisive contribution to supporting the smooth transition of young persons from education to the labour market by providing a well-functioning education system and labour market institutions that do not introduce distortions into the labour market.

11 Such mechanisms are theoretically well established (see, for example, Acemoglu (1996)).

12 Nevertheless, comparing Europe with the United States, Wasmer et al. (2006) find that Europe differs from the United States in that the higher priority given to secondary education is accompanied by underfunding in tertiary education, notably advanced tertiary education. Noting that for investment in education to pay off, the skills provided by education must match the actual demand for skills, they find, for example, that employment protection legislation promotes the longevity of jobs, which tends to favour specific skills and thus contributes to mismatch problems in Europe.

## ANNEX I

### INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION (ISCED) CATEGORIES

#### EARLY CHILDHOOD EDUCATION (ISCED 0)

Early childhood education serves the dual purpose of giving the child daily care while the parents are at work and of contributing to the child's social and intellectual development in keeping with the rules and guidelines of the pre-primary curriculum. It covers all forms of organised and sustained centre-based activities designed to foster learning, and emotional and social development in children. The term centre-based distinguishes between activities in institutional settings (such as primary schools, pre-schools, kindergartens, day-care centres) and services provided in households or family settings. Generally, programmes at this level do not start before the age of three.

#### PRIMARY LEVEL OF EDUCATION (ISCED 1)

Primary education usually begins at the age of five, six or seven and lasts for four to six years (the mode of the OECD countries is six years).

#### LOWER SECONDARY LEVEL OF EDUCATION (ISCED 2)

The core of lower secondary education continues the basic programmes of the primary level, but usually in a more subject-oriented manner. It usually consists of two to six years of schooling (the mode of OECD countries is three years). The common feature of lower secondary programmes is their entrance requirement, i.e. completion of at least primary education and demonstration of an ability that will benefit from participation in the programme.

#### UPPER SECONDARY LEVEL OF EDUCATION (ISCED 3)

Upper secondary education usually consists of two to five years of schooling. Admission into educational programmes at the upper secondary level requires the completion of the lower secondary level of education, or a combination of basic education and vocational experience that demonstrates an ability to handle the

subject matter. Upper secondary education may either be preparatory, i.e. preparing students for tertiary education (ISCED 3A and ISCED 3B) or terminal, i.e. preparing students for direct entry into working life (ISCED 3C).

#### POST-SECONDARY NON-TERTIARY LEVEL OF EDUCATION (ISCED 4)

Post-secondary non-tertiary education programmes straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered upper secondary or post-secondary programmes in a national context.

#### FIRST STAGE OF TERTIARY EDUCATION (ISCED 5)

The educational content of ISCED 5 programmes is more advanced than that of those offered at Levels 3 and 4. Entry into these programmes normally requires the successful completion of ISCED Level 3A or 3B or a similar qualification at ISCED level 4A or 4B. Level 5 programmes must have a cumulative theoretical duration of at least two years from the beginning of Level 5 and do not lead directly to the award of an advanced research qualification.

Tertiary-type A programmes (ISCED 5A) are largely theory-based and designed to provide sufficient qualifications for entry into advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture. Tertiary-type A programmes have a minimum cumulative theoretical duration (at tertiary level) of three years full-time equivalent, although they typically last four or more years. These programmes are not offered exclusively at universities. Conversely, not all programmes that are nationally recognised as university programmes fulfil the criteria to be classified as tertiary-type A. Tertiary-type A programmes include second degree programmes, such as the American Master.

Tertiary-type B programmes (ISCED 5B) are typically shorter than those of tertiary-type A and focus on practical, technical or occupational

skills for direct entry into the labour market. They have a minimum duration of two years full-time equivalent at the tertiary level.

**ADVANCED RESEARCH QUALIFICATION (ISCED 6)**

This level is reserved for tertiary programmes that lead directly to the award of an advanced research qualification, e.g. a PhD. The theoretical duration of these programmes is three years full-time in most countries (for a cumulative total of at least seven years full-time at the tertiary level), although the actual enrolment time is typically longer. The programmes are devoted to advanced study and original research.

## **ANNEX 2**

### **LABOUR MARKET INSTITUTIONS**

#### **EMPLOYMENT PROTECTION**

This is the strictness of employment protection laws (0=low, 2=high). Data are taken from the Labour Market Statistics Database, Nickell and Nunziata (2001).

#### **ACTIVE LABOUR MARKET PROGRAMMES (ALMPS)**

Public expenditure on labour market programmes expressed as a percentage of GDP. It covers five main categories, of which we have focused on labour market training, youth measures and subsidised employment. Source: OECD.

#### **COORDINATION INDEX**

This variable captures the degree of consensus between the actors in collective bargaining (1=low, 3=high). Data are taken from the Labour Market Statistics Database, Nickell and Nunziata (2001).

#### **UNION DENSITY**

This is the ratio of total reported union members (fewer retired and unemployed members) to total employees. Data are taken from the Labour Market Statistics Database, Nickell and Nunziata (2001).

#### **UNEMPLOYMENT BENEFIT REPLACEMENT RATIO**

This is the benefit entitlement before tax as a percentage of previous earnings before tax. Data are averages over replacement rates at two earnings levels (average and two-thirds of average earnings) and three family types (single, with dependent spouse and with spouse at work). They refer to the first year of unemployment. Data are taken from the Labour Market Statistics Database, Nickell and Nunziata (2001).

## ANNEX 3

## PISA results on reading, scientific and mathematical literacy of 15 year-olds, 2003

	Reading literacy		Scientific literacy		Mathematical literacy		Summary	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Belgium	507	4	509	4	530	2	515	3
Germany	491	6	502	6	500	6	498	6
Ireland	515	2	505	5	476	8	499	5
Greece	472	11	481	9	437	11	463	10
Spain	481	7	487	8	476	8	481	7
France	496	5	511	3	508	5	505	4
Italy	476	10	486	10	470	9	477	8
Luxembourg	479	8	483	11	488	7	483	7
Netherlands	513	3	524	2	526	3	521	2
Austria	491	6	491	7	515	4	499	5
Portugal	478	9	468	12	450	10	465	9
Finland	543	1	548	1	539	1	543	1
Euro area	495		500		493		496	

Sources: [www.pisa.oecd.org](http://www.pisa.oecd.org) and own calculations.

Note: The euro area averages are unweighted. OECD definitions of the respective literacy:

- Reading literacy is the ability to understand, use and reflect on written texts in order to achieve one's goals, to develop one's own knowledge and potential and to participate actively in society.
- Scientific literacy reflects students' ability to use scientific knowledge, to recognise scientific questions and to identify what is involved in scientific investigations, to relate scientific data to claims and conclusions and to communicate these aspects of science.
- Mathematical literacy concerns students' ability to recognise and interpret mathematical problems encountered in the world, to translate these problems into a mathematical context, to interpret the results in terms of the original problem, to reflect upon the methods applied and to formulate and communicate the outcomes.



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ISSN 1607-1484



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