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Youth unemployment in the period 2001–2010 and the European crisis – looking at the empirical evidence

Hans Dietrich
Senior Researcher on Education and Employment over the Life Course at the Institute for Employment Research (IAB) in Nürnberg

Summary
This article examines the development of youth unemployment in the period 2001–2010 from a macro perspective. As dependent variables, alternative concepts of measuring youth unemployment are introduced. Whilst the traditional youth unemployment rate responds best to business cycle effects, improvement of the overall education level, or growth of the share of industrial employment, it does not respond to the relative growth of inactive young people. As alternatives, the NEET ratio and the share of unemployed in the youth population are employed, which both relate unemployment or joblessness to the youth population. Compared to the NEET model the latter model is more sensitive to the change in size of the inactive youth population and delivers good explanatory power. Finally, the ratio of youth unemployment to the corresponding adult rate was tested, and found to have increased in the 2000s until 2008. In the years of crisis, however, this ratio stagnated or decreased even slightly. Generally speaking, the development of this ratio seemed only to be weakly connected to the business cycle in the 2000s, something which should be further researched. Possible consequences for political action are discussed.

Résumé
Cet article examine, selon une perspective macro-économique, l'évolution du chômage des jeunes sur la période 2001-2010. Des conceptions alternatives de la mesure du chômage des jeunes sont introduites comme variables dépendantes. Si la conception traditionnelle du taux de chômage des jeunes reflète au mieux les effets du cycle conjoncturel, de l'amélioration du niveau général de formation ou de la croissance de la part de l'emploi industriel, cette conception ne rend pas compte de l'augmentation relative des jeunes inactifs. Le ratio NEET et la part des personnes sans emploi dans la population des jeunes sont utilisés comme alternatives, qui toutes deux établissent une relation entre le chômage ou l'absence d'emploi et la population jeune. Comparé au modèle NEET, le dernier modèle utilisé rend mieux compte des changements dans la taille de la population des jeunes inactifs et présente un pouvoir explicatif satisfaisant. Enfin, le ratio du chômage des jeunes

Corresponding author:
Hans Dietrich, Institute for Employment Research (IAB), Regensburger Str. 164, D-90478 Nürnberg.
Email: hans.dietrich@iab.de

par rapport à celui des adultes a été également testé: ce ratio a augmenté dans les années 2000, jusqu'en 2008. Durant les années de crise, cependant, le ratio a stagné ou a même légèrement baissé. Généralement parlant, l'évolution de ce ratio n'a semblé que faiblement liée au cycle conjoncturel des années 2000, même si ce point mérite des recherches supplémentaires. Les conséquences possibles en termes d'actions politiques sont examinées.

Zusammenfassung
Dieser Beitrag untersucht die Entwicklung der Jugendarbeitslosigkeit im Zeitraum 2001-2010 auf Makroebene. Es werden alternative Konzepte zur Ermittlung der Jugendarbeitslosigkeit als abhängige Größe eingeführt. Während die herkömmliche Jugendarbeitslosenquote am stärksten auf konjunkturelle Effekte, die Verbesserung des allgemeinen Ausbildungsniveaus oder die Erhöhung des Beschäftigungsanteils in der Industrie anspricht, reagiert sie nicht auf die relative Zunahme erwerbsloser junger Menschen. Alternativ dazu werden die NEET-Quote (der Anteil junger Menschen, die sich nicht in schulischer oder beruflicher Ausbildung befinden und keiner Arbeit nachgehen) und der Anteil Erwerbsloser in der jungen Gesamtbevölkerung verwendet, die beide die Arbeits- und Erwerbslosigkeit ins Verhältnis zur jungen Gesamtbevölkerung setzen. Im Vergleich zur NEET-Quote reagiert letzteres Modell besser auf Veränderungen in der Anzahl junger Erwerbsloser und bietet auch gute Erklärungsansätze. Abschließend wurde noch das Verhältnis zwischen Jugend- und Erwachsenenarbeitslosigkeit untersucht, was zeigte, dass sich diese Kennzahl in den 2000er Jahren bis 2008 erhöht hat. In den Krisenjahren stagnierte sie hingegen oder war sogar leicht rückläufig. Allgemein betrachtet, schien die Entwicklung dieses Verhältnisses in den 2000er Jahren nur einen schwachen Zusammenhang mit der Konjunktur aufzuweisen, was weiter untersucht werden sollte. Der Beitrag erörtert außerdem mögliche Konsequenzen für politische Maßnahmen.

Keywords
Youth unemployment, economic recession, business cycle, panel analysis

Youth unemployment in the period 2001–2010 – is youth unemployment so special?

The first signs of recession were to be seen in 2007, with the full-blown financial crisis spilling over into the real economy and labour markets worldwide over the next one to two years. GDP growth and employment suffered a significant downturn from 2008 onwards, though with country-specific variations. EU GDP fell by 4.3 per cent in 2009, and youth unemployment in Europe rose sharply between the second quarter of 2008 and the third quarter of 2009 and again, after an intermediate recovery, from the third quarter of 2011 onwards. These years of recession seem to reflect a long-familiar macroanalytical relationship between changing economic conditions and the development of youth unemployment. Several macroanalytical studies have addressed the effect of business cycles on youth unemployment, though have also indicated major country-specific variations (see Blanchflower and Freeman, 2000; Contini, 2010; Bell and Blanchflower, 2010, 2011; Verick, 2011). Apart from the business cycle, further macro factors are of relevance, including structural (the state of a country's economy or workforce) and institutional factors such as employment protection, forms of labour contracts, general and vocational education, etc. Looking specifically at young people, the linkage between the educational system and

the (youth) labour market and its effect on a young person's school-to-work transition is of additional relevance.

Besides these explanatory factors, the concept of measuring youth unemployment itself is discussed. Typically, the youth unemployment rate (YUER) is applied to compare the occurrence of youth unemployment over time and between countries. However a number of arguments need to be considered, stressing the limitations of the youth unemployment rate and prompting alternative concepts of measuring youth unemployment at the macro level (Martin, 2009; Scarpetta et al., 2010), such as the so-called NEET concept.

The aim of this article is to explore youth unemployment in the last decade with specific regard to the first years of the recession. In a nutshell, the article analyses the occurrence of youth unemployment in the 2001–2010 period, testing alternative concepts of identifying youth unemployment by applying macroanalytical models. In the following section these alternative concepts are introduced. Data, explanatory variables and methods are also discussed in this section. Section 3 looks at the results of estimates in which selected macro variables have been employed to explain the course of youth unemployment in the 2001–2010 period in EU Member States. Alternative definitions of youth unemployment are introduced as dependant variables, exploring their sensitivity. Section 4 looks at possible fields of action, while Section 5 concludes the article.

Data and measurements

Data

Most of the data used in this article are taken from the European Union Labour Force Survey (EU LFS), which collects data via household sample surveys 'providing quarterly results on labour participation of people aged 15 and over as well as on persons outside the labour force'.[1] In this article, LFS data aggregated by country on a yearly basis are used. In addition GDP growth figures are included, likewise supplied by Eurostat. A description of the data sources is provided in Table A1 in the appendix. The data used here cover a sub-sample of 23 EU Member States. Due to data limitations, Cyprus, Luxembourg, Malta and Romania are excluded, and the observation window is restricted to the years 2001 to 2010. As not all countries provide the whole set of variables for the whole observation window, the following analysis employs a not perfectly balanced panel, with the data for the 23 countries being taken from a total of 203 observations.

Measuring youth unemployment

In statistical terms the category 'young people' is defined as those aged between 15 and 24. This definition ties in with national and European definitions of young people used for example in labour or social law. Different concepts may be used in other domains of law or the social sciences, as seen for example in the field of school-to-work transitions where this technical definition of 'young people' does not fully coincide with the average age range of those going through school-to-work transitions in contemporary times (Dietrich, 2012; Chung et al., 2012). Individual transitions can vary due to individual circumstances, educational paths or other country-specific institutional conditions and might even include individuals in their 30s (see Ryan, 2001; Raffe, 2003, 2008). However, from a comparative perspective and due to the age grouping of the LFS

1 See http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/lfs.

data, the definition of young people as being aged between 15 and 24 is applied in the following sections.

The term 'unemployment' similarly has varying definitions. In this article the LFS concept of unemployment is used which is based on a self-assessment of respondents. The LFS questionnaire replicates the criterion of unemployment as defined by the ILO, which defines a person as unemployed who fulfils the following criteria during a defined reference period:

(a) 'without work', i.e. not in paid employment or self-employment;
(b) 'currently available for work', i.e. available for paid employment or self-employment during the reference period; and
(c) 'seeking work', i.e. have taken specific steps in a specified recent period to seek paid employment or self-employment. The specific steps may include registration at a public or private employment exchange; applications to employers; looking for jobs, placing or answering newspaper advertisements; seeking assistance from friends or relatives and so on.

The LFS/ILO concept is more flexible than the national definitions of unemployment and enables a cross-country comparative perspective, which is not possible applying the various national concepts of measuring unemployment. A main important difference of national concepts in comparison to the LFS concept is that these require registration at labour offices to a different extent. In contrast, the LFS concept includes also people looking for employment on their own, but also labour market scheme participants who are seeking work but are not included in national unemployment registers. This explains some of the notable differences between country-specific concepts of unemployment and the LFS concept. Thus the latter represents a more subjective kind of unemployment measurement as it is based on household survey data, not cross-checked by national authorities like employment offices.

As the standard concept of measuring the distribution of youth unemployment, at first the youth unemployment rate (YUER) is introduced. In contrast to unemployment figures published by the countries themselves, the YUER calculated with LFS data allows us to compare youth unemployment over time and countries. The unemployment rate is calculated as the percentage of unemployed in the labour force. Labour market participation may be used as a substitute for the labour force or the 'currently active population', which comprises all persons who meet the requirements for inclusion among the employed or the unemployed. Figure 1 shows the overall development of the EU youth unemployment rate in the last decade.

Youth unemployment rates at both European and national levels (for country-specific results see Dietrich, 2012) fluctuated considerably in the 2001–2010 period. Within the European Member States (EU-27), the youth unemployment rate over this period reached its lowest level in 2007 (15.5 per cent), rose to 20.9 per cent in 2010, and is still rising.

Taking into account the fact that in different countries and for different sub-groups (e.g. educational groups) the average age of transition into the labour market and employment and consequently the potential duration of labour market experience varies systematically, looking at the ratio of unemployed within the total of a specific age group (and not within the labour force of that age group only) is perhaps better. This alternative youth unemployment ratio (share of young unemployed in youth population) (YPUER) (Choudhry et al., 2012) is a more robust population-based indicator, reporting the share of young unemployed within the youth population. From a European perspective the population share of young unemployed averaged 7–9 per cent (Figure 2) in the 2001–2010 period, compared to 15–21 per cent for the corresponding youth unemployment rates reported in Figure 1.

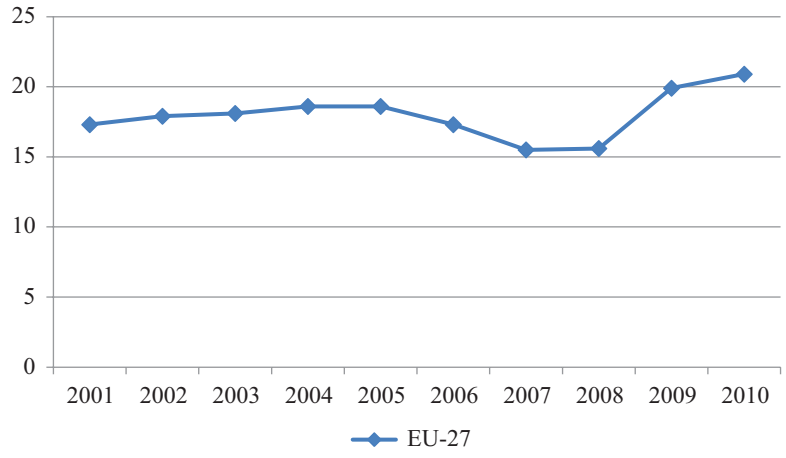

Figure 1. Youth unemployment rate (YUER), EU-27, 2001–2010.
Sources: Eurostat, LFS; author's calculations.

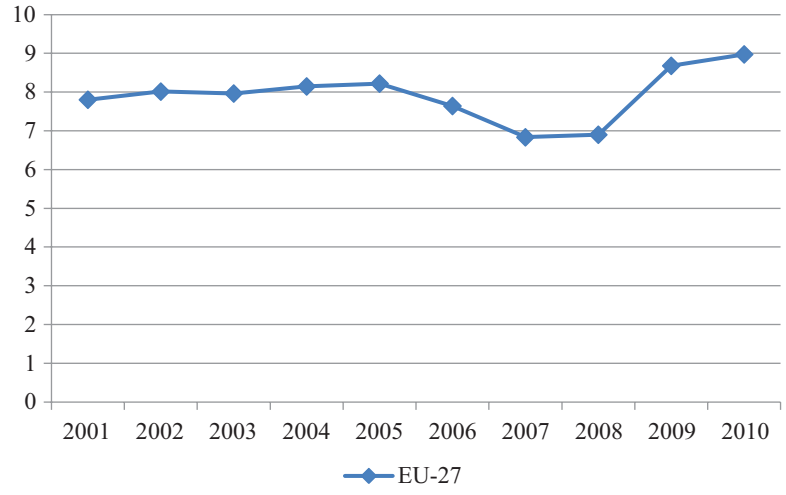

Figure 2. Share of young unemployed in youth population (YPUER), EU-27, 2001–2010.
Sources: Eurostat, LFS; author's calculations.

Especially with regard to young people, some scholars consider the ILO concept of unemployment as too narrow to capture the whole population of jobless and/or job-seeking young people not (yet) integrated into the labour market. Concepts such as 'NEET', 'the idleness rate', or 'disconnected young people' cover transitions between education and the labour market which may have more relevance to young people than to other age groups. The 'idleness rate' for instance describes the share of young people in neither education nor employment, of which the unemployed comprise a sub-group (Martin, 2009: 15). An alternative term is 'disconnected young people' (Fernandes and Gabe, 2009; Pfeiffer and Seiberlich, 2010). Comparing disconnected youth and

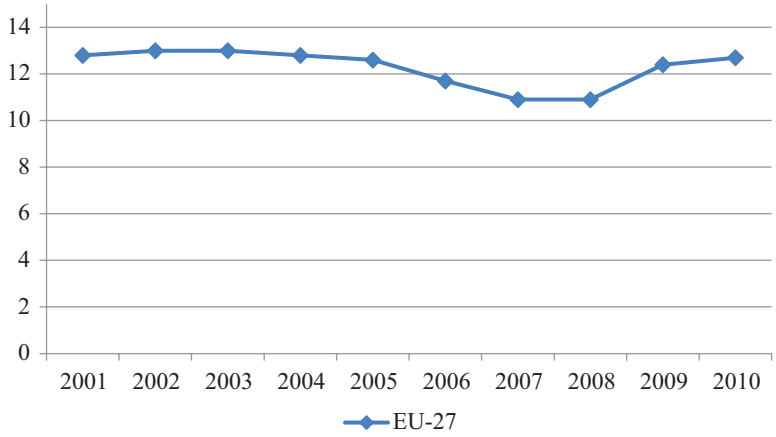

Figure 3. Share of the NEET group in youth population (NEET ratio), EU-27, 2001–2010.
Sources: Eurostat, LFS; author's calculations.

unemployed youth, empirical findings show that lacking access to work on the part of young school-leavers accounts for only one-quarter of the disconnected youth population in the United States, for example. Further important factors are non-severe or severe disabilities or taking care of family members and/or children (Fernandes and Gabe, 2009: 16).

The concept of 'NEET', an acronym for 'not in education, employment or training' (see Williamson, 1997; Furlong, 2006; Yates and Paine, 2006; Robson, 2010; Williamson, 2010) is closely related to the idleness rate and 'disconnected youth'.

The 'NEET' metaphor emerged in the Welsh or more general British social exclusion debate and became a benchmark indicator in British youth policy and the Connexions service for under-18s (Yates and Paine, 2006). Though criticized for its conceptually narrow focus on 'problematic transitions' (Furlong, 2006), as a statistical concept NEET has acquired a broader substantive and more statistical meaning in recent years (see Robson, 2010; Eurofound, 2012). The NEET concept differs from the ILO unemployment concept with respect to two dimensions, in that it includes people not requiring the job-seeking requirement to become classified as unemployed, and it excludes young people in training (Eurofound, 2012: 23). Thus the overlap between the unemployed and the NEET group varies over time and country. Furthermore, the NEET cohort might not only include people who have lost their connection to the labour market (involuntarily or voluntarily), but also people who have taken over care tasks for family members or who voluntarily prefer an episode of 'idleness' (see Eurofound, 2012: 22 ff). Here the NEET ratio relates the NEET group to the youth population (compared to YPUER). From an empirical perspective the NEET ratio is located between YUER and YPUER. Figure 3 describes the NEET ratio over time. It similarly follows the YUER curve, though at a lower level and with a lower degree of fluctuation.

Finally, youth unemployment rates are related to the corresponding adult unemployment rates over time. This relationship is expressed by the ratio of the youth unemployment rate to the adult unemployment rate (youth/adult ratio or YAR). From a technical perspective, YAR is simply a multiple of the adult unemployment rate (Breen, 2005: 129). On average, youth unemployment rates are around two and a half times as high as those of adults aged 25 to 65, with average YAR at 2.42. The YAR increased during the 2001–2010 period, peaking in 2008, the first year of

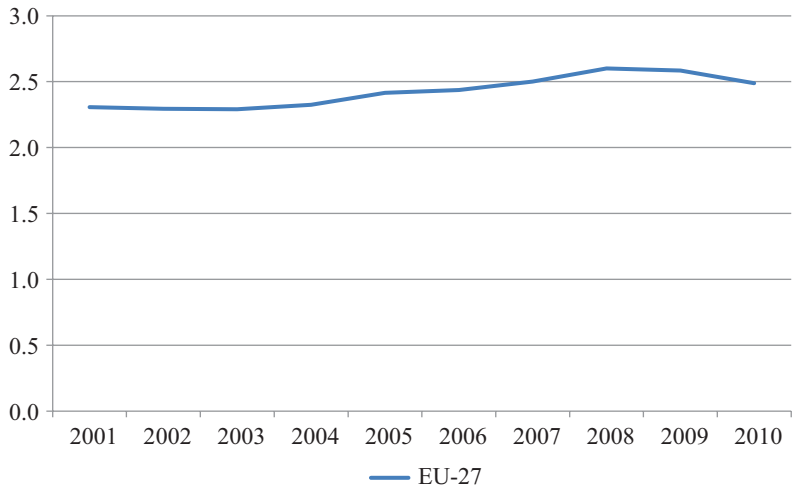

Figure 4. Ratio between youth (15–24) unemployment rate and adult (25–64) unemployment rate (YAR), EU-27, 2001–2010.

Sources: Eurostat, LFS; author's calculations.

Table 1. Correlation matrix of alternative measures of youth unemployment.

	YUER	YPUER	Neet ratio	YAR
Youth unemployment rate (YUER)	1.0000			
Youth unemployment ratio (YPUER)	0.8069*	1.0000		
Not in Employment, Education or Training ratio (NEET)	0.6147*	0.3080*	1.0000	
Youth to adult unemployment ratio (YAR)	0.5873*	0.3982*	0.0698	1.0000

Legend: Significance level * p<.05

Sources: Eurostat, LFS; author's calculations.

recession. During the years of recession the ratio decreased somewhat, indicating that in the course of the first years of recession (2008 to 2010) adult unemployment rates increased later, but then overtook the growth rate of YUER. This effect is expressed by the slightly decreasing YAR at the end of the decade (Figure 4).

In summary, Table 1 shows the correlation matrix of the four alternative measures of youth unemployment. While the correlation between the youth unemployment rate (YUER) and the population share of young unemployed (YPUER) is high (.81), the NEET ratio is only partially connected to the unemployment rate (.61). The same is the case for the correlation with the youth/adult unemployment ratio (YAR) (.59) (Table 1). These findings are in line with the Eurofound 2012 results which found that the unemployed contributed about 50 per cent to the NEET population in 2012 (Eurofound, 2012: 29).

Explanatory variables

In the following sub-section relevant explanatory factors affecting youth unemployment are introduced. Economic and socio-economic variables are employed as explanatory variables at a country

level. In line with the most recent crisis literature, the business cycle seems to be a key factor in macroanalytical models (Jimeno and Rodriguez-Palenzuela, 2002; Choudhry et al., 2012). According to the literature youth unemployment figures respond more directly to business cycle fluctuations than adult unemployment figures (Blanchflower and Freeman, 2000; Jimeno and Rodriguez-Palenzuela, 2002; OECD, 2006). Jimeno and Rodriguez-Palenzuela (2002) additionally show that adjustments to macroeconomic upheavals hit young workers more than adult workers. To measure the business cycle the growth rate of the gross domestic product (GDP) is used. This measures the annual change of economic activity, defined as the value of all goods and services produced minus the value of any goods or services used in their creation. Furthermore, one year lagged data (lGDP) are of relevance, both to address the time-dependent causal effect and to obey statistical requirements.

Besides the business cycle, the mismatch of qualifications and group-specific labour market participation are identified in the literature as factors explaining unemployment in general and youth unemployment in particular (see Clark and Summer, 1982; Blanchflower and Freemann, 2000). Here, the variable 'industry' is introduced, reflecting the change of the share of employed in the industry (manufacturing) related to all employed. To reflect the causal structure of the industry effect the indicator is introduced in its one year lagged form ('industry lag').

Since the 1990s labour market relevant institutions and their impact on age-specific unemployment risk have been addressed. In the meantime a whole set of institutional factors have been identified, affecting for instance the timing of young people leaving school and entering the labour market, or determining the unemployment risk (Blanchard, 2005; Gangl, 2006; Martin, 2009; Bell and Blanchflower, 2011). A key factor in the school-to-work transition literature is the occurrence of temporary employment contracts (Scherer, 2004; Gebel, 2010). The variable 'tempant' as the share of temporary employed among all employed under-25's is used as a rough measure for the atypical employment risks of young people.

Furthermore, there seems to be a clear relation between a person's level of education and their unemployment risk. Here the share of inactive young people within the youth population ('inactive') indicates the extent to which young people are in a country's educational system at the time of observation. As a variable, 'inactive' implicitly measures the average level of education of young people. As we know, European countries have experienced an expansion of education, with increasing levels of educational attainment overall; however with a country-specific timing. The variable 'hedu' thus measures the share of people with higher education (upper secondary and tertiary education) within the whole population (15 to 64 year-olds), and indicates the overall expansion of education in the observed European countries over the last decades.

Due to a lack of a time-variant and detailed data some important dimensions cannot be included in the analytical model, as is the case with a country's level of company-based apprenticeship training. Furthermore, there is no systematically comparable information on the extent of available active labour market schemes for young people, guidance and counselling opportunities of public employment services, changes in employment protection regulation, etc. The same is the case for population change in the youth population. LFS data only provide age-clustered (five age brackets) data, and do not allow a breakdown taking fertility and migration effects into account. Thus the causal nature of population effects cannot be identified.

Summing up, alternative ways of measuring youth unemployment are identified and applied to the data available for a 10-year observation window. As also shown in Table 2, both the average level and the variance over time and countries are remarkable, with the YUER ranging between 4.6 and 41.6. The same is true for YPUER, NEET, and YAR.

Table 2. Dependant and explanatory variables.

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Dependant variables					
Youth unemployment rate (YUER)	203	18.0837	7.5299	4.6	41.6
Youth unemployment ratio (YPUER)	203	7.3812	2.9092	2.3	17.7
Not in employment, education or training ratio (NEET)	203	11.3817	4.5622	3.4	29
Youth to Adult unemployment ratio (YAR)	203	2.6263	.6557	1.1	4.8
Independent variables					
GDP growth (gdp)	203	2.2566	4.2218	−17,7	11.2
GDP growth lagged (lgdp)	203	2.4152	4.2254	−17,7	11.2
Share of inactive youth (inactive)	203	56.4248	12.9251	26.1	75.2
Share of higher educated (hedu)	203	68.9837	12.9529	22.3	85.6
Share of employed in industries lagged (industry)	203	26.6561	5.5510	16.6	38.7
Share of temp employed youth (tempant)	203	30.0679	18.2126	0	62.6

Sources: Eurostat, LFS; author's calculations.

Modelling

Given the panel structure of country-aggregated data (observing 23 countries over a maximum of 10 years) and the continuous nature of dependant variables (rates), linear regression models are applied. To exploit the data structure panel models are preferred. Tests favour fixed-effect models instead of the random-effect models. Due to heteroskedasticity cluster robust country fixed-effect panel models are estimated[2]. But even from a substantive perspective country-specific fixed-effect models are preferred, as these allow changes of the explanatory variables within countries to be identified, and avoid the problem of severe level differences between countries. Otherwise a further set of variables would be required to control for country differences.

Youth unemployment from a macro perspective – empirical findings

Whilst the effects of individual factors on an individual's risk of becoming unemployed are well documented for young people (Bell and Blanchflower, 2011; Dietrich, 2012; Eurofound, 2012), the effect of macro factors beyond the business cycle effect seems to be less well explored. Macro-oriented models typically address country differences e.g. welfare state traditions (Caroleo and Pastore, 2007). In this article intra-country developments are mainly addressed. Alongside theoretical considerations, this is supported by methodological considerations (such as a small number of observations and a short series of panel data with a maximum of 10 observations per country) favouring fixed-effect panel models and addressing differences within countries rather than differences between countries.

A first model estimates the effect of the above-introduced set of macro variables on the youth unemployment rate (YUER). As expected, the youth unemployment rate responds directly to the business cycle, here measured as GDP growth and lagged GDP growth. A decrease of GDP over a period of several years leads to significant increases in the youth unemployment rate within countries. The higher the general level of education, the lower the youth unemployment rate will be; the

2 The correlation matrix (Choudhry et al., 2012: 82) indicates that multi-collinearity seems not to be a severe problem in the models.

Table 3. Effects of macro factors on youth unemployment, 2001–2010.

Variable	YUER	YPUER	NEET	YAR
GDP growth (gdp)	−0.4599***	−0.1896***	−0.1470**	−0.0164***
GDP growth lagged (lgdp)	−0.6040***	−0.2322***	−0.2010***	.0.0097*
Share of inactive youth (inactive)	−0.1567	−0.2469**	−0.1284	−0.0315**
Share of higher educated (hedu)	−0.6378**	−0.2790***	−0.3547*	0.0052
Share of employed in industries lagged (industry)	−1.8352***	−0.7640***	−0.5094*	−0.0417
Share of temp employed youth (tempant)	0.1685	0.0864	0.0255	0.0109
constant	22.7585***	9.6419***	13.3552***	2.6953***
N	203	203	203	203
r2_w	0.6046	0.5887	0.3189	0.1689
sigma_u	19.8168	8.9680	8.6738	0.8836
sigma_e	3.3240	1.4179	1.8784	0.2466
rho	0.9726	0.9756	0.9552	0.9277
	legend: * p<.1; ** p<.05; *** p<.01			

Country fixed-effect models with robust standard errors.
Sources: Eurostat, LFS; author's calculations.

higher the share of the labour force employed in industry (compared to other non-industrial sectors), the lower the youth unemployment rate. The share of inactive young people has no significant effect on the youth unemployment rate. However, that does not indicate that there is no relation between the share of inactive and the YUER; a closer examination of the data indicates that the relation of the youth unemployment rate and share of inactive varies extensively between countries. The effect of temporary contracts on youth unemployment is weak and insignificant, with the same being true for the lagged effects of temporary employment (Table 3).

A second model estimates the effect of macro variables on the youth unemployment ratio (YPUER), the unemployed share of the total youth (15–24) population. As shown in Table 3, YPUER again is mainly driven by GDP growth and factors related to the labour market. In general, however, the effect of labour market factors on the YPUER is weaker than in the YUER model. By contrast, the share of inactive young people has a significant negative effect on YPUER, mainly due to the fact that a higher share of inactive young people (i.e. staying longer in the educational system) is associated with an overall higher level of education, in turn reducing both the group-specific and – at an aggregated level – the overall unemployment risk.

In a third model the importance of macroeconomic factors on the NEET ratio is explored. The NEET ratio covers both the unemployed and inactive young people not in education or training, i.e. those not actively seeking for a job, having given up looking for a job or not expecting to find a job when seeking. From a theoretical perspective it could be expected that this group would respond to the business cycle in a way similar to that seen with the YPUER. The longer and the more pronounced the economic downturn is, the more this ratio could be expected to increase. In contrast to the YUER and the YPUER models, the NEET model shows however a less significant response. Compared to the previous two models both the share of explained variance and the effect of the explanatory variables are weaker or even statistically insignificant (Table 3). These results support the assumption that NEET includes more heterogeneous groups with a lower attachment to the labour market, such as people opting for a sabbatical, voluntary leisure time, or taking over care obligations for family members.

In a final step YAR is used as a dependent variable. Compared to the foregoing models, the YAR model has the weakest explanatory significance. The explained variance of the YAR model is significantly lower than that of the other models. The contribution of the explanatory variables is weak or statistically insignificant (Table 3). While YAR was increasing up till 2008, the empirical model identified the business cycle as only having a weak effect. This indicates that whilst both the youth and the adult unemployment risk are strongly connected to the business cycle, in the last decade a second effect shows up which seems to be more secular and independent from the business cycle. Thus the relative risk of young people becoming unemployed compared to that of adults increased significantly. Here structural and institutional effects such as employment protection, recruitment policies, or a growing complexity in individuals' school-to work transitions might influence that secular effect (Martin, 2009; Chung et al., 2012). During the first years of crisis (here 2008–2010) YAR stabilized and decreased even slightly, however – when expressed in real figures – at a worrisome level.

To make youth unemployment figures comparable over time and country, rates or ratios are used. The results show that the four concepts in the macroanalytical models have different levels of sensitivity. The youth unemployment rate (YUER) responds very directly to both GDP growth and other macro variables. That is due to the fact that the two variables on which the YUER is based (numbers of unemployed and numbers of employed) are derived from the labour market, and their performance is strongly linked to GDP. GDP effects are significantly lower in the population model (YPUER). Unfortunately the LFS data do not take fertility and migration effects into account, and thus the causal effect of the demographic factor cannot be addressed in the models. The inactive share in the youth population indicates higher school attendance rates, thus reducing the YPUER. Similar to YPUER, NEET is a measurement related to the overall youth population; however, a modified definition of unemployment is applied, as described in Section 2. In contrast to the YPUER model, the NEET model delivers a significantly lower level of explained variance. GDP effects are weaker compared to both the YUER and YPUER models, indicating that NEET occurrence is not only driven by economic factors, but also related to other social dimensions. The supporting effect of the 'hedu'-variable (share of higher educated in the society) supports this argument. Finally the YAR model shows the significant but weak effect of the business cycle on the youth/adult unemployment ratio. The explanatory significance of the model remains weak, however. The share of temporary employment as a rough indicator of non-standard employment and related employment protection seems to have no significant effect on youth unemployment in any of the models. This finding is backed up by the literature, which basically says that non-standard employment and labour market protection are multi-dimensional and not to be captured by a single indicator.

To summarize the analytical section, the four concepts of comparing youth unemployment over time and countries show model-specific effects. Furthermore, the simple macroanalytical model applied here indicates that the business cycle seems to be a strong but not unique causal factor. Alongside the business cycle, the educational level of society, the structure of the educational system, the structure of the economy and forms of employment protection are further relevant variables preventing or fostering youth unemployment in the individual countries.

Avoiding youth unemployment – possible areas of action

Section 3 looked at the alternative measurements of youth unemployment from a comparative and analytical perspective, discussing the pros and cons of the concepts. When focusing on the relationship between the business cycle and youth unemployment, both the youth unemployment rate and

the youth unemployment ratio are to be favoured. Furthermore, the modelling delivers some empirical evidence which might be of relevance for possible fields of action. Over and above the structure of a country's economy and its determinants (such as state debt, the division of labour, sectoral change, technological progress, levels of foreign investment and exports, etc.) which are only covered marginally in the analytical section of this article, the following section looks at education and training on the one hand and labour market institutions such as employment protection or active labour market policy on the other.

Education and training

At the latest since the advent of human capital theory there is scientific consensus that education and qualifications are preconditions for labour market integration and labour market success. From a comparative perspective, however, that consensus seems to be much weaker with regard to the labour market effects of vocational versus general education, industry-versus occupation-specific training, secondary vocational training versus tertiary academic degrees. Moreover, outcome variables such as the smooth transition from vocational training to work, labour market flexibility and income development over the course of a career (see Mendes and Sofer, 2004; Hanushek et al., 2011) are valued differently. From a theoretical perspective the arguments are based on general and specific human capital (Becker, 1962) versus screening and signalling (Spence, 1973; Weiss, 1995); supply and demand aspects are linked by matching models (Soerensen and Kalleberg, 1981; Cahuc and Zylberberg, 2004; Gangl, 2003). From a sociological perspective the educational attainment mechanism is explored in manifold ways (Spring, 1976; Kerckhoff, 1995) and as a consequence country-specific models (Allmendinger, 1989; Shavit and Müller, 1998) are identified, reflecting multidimensional institutional settings (Van de Werfhorst and Mijs, 2010), focused more on country-specific mechanisms and pointing to the serious limitations of simplified inter-country comparisons.

Whilst the institutional embedding of an educational system is country-specific, the underlying mechanism of educational aspiration and attainment seems to be more general. From a rational choice perspective, the status attainment of young people is closely related to social background due on the one hand to the direct effects of educational or labour-market-related decisions and on the other hand to the indirect effects of class-related variation e.g. in school performance (Boudon, 1974). In this theoretical perspective we have to take into account both class-specific access to resources (financial capital, cultural, and social capital: Bourdieu and Passeron, 1980) and social-class-related perceptions of opportunity structures, aspirations to educational success and status attainment, and differences in subjective success probability or cost expectations (Breen and Goldthorpe, 1997). In the case of an individual's expected or realized experience we can assume a social-class-related mechanism avoiding the occurrence of individual unemployment or reducing the duration of individual unemployment. As Dietrich and Kleinert (2005) show, a person's probability of moving out of unemployment depends both on their school performance and other characteristics related to their social background. Returning to education, entering the labour market in under-qualified or inappropriate jobs or participating in job-creating schemes is not equally distributed over social cohorts. Clark (2011) states that the youth labour market is severely impacted through enrolment in post-compulsory education (thus prolonging participation in the educational system) or returning to education in the case of expected or actual unemployment.

Reflecting on those findings, improved institutional settings regarding the educational system need to be supplemented by public efforts to support young people's decisions. Guidance and counselling is needed to support individuals from lower social backgrounds, in particular in their

decisions for higher vocational and/or academic education. Similarly they need to be provided with relevant resources.

An alternative strategy to avoid individual unemployment or to reduce its duration could involve regional or cross-border mobility, with young people from disadvantaged areas moving to more prosperous areas within a county or abroad. The relationship between regional unemployment density and regional migration has been explored for many decades now (see for example Pissarides and Wadsworth, 1989; Ahn et al., 1999; Pekkala and Tervo, 2002; Windzio, 2007). The likelihood of regional mobility motivated by training or labour market demand is significantly higher both for the well-trained and for younger people (Kalter, 1997; Böheim and Taylor, 2002). Haas and Damelang (2010) have analysed the mobility of young job-seekers to Germany, while Cairns (2010) has looked into comparative European findings on the mobility of young job-seekers.

Employment protection, active labour market policy, and youth schemes

There is extensive literature discussing the correlation between employment protection legislation and national levels of youth unemployment or their unemployment risk. Even if the picture was never strictly evidence-based, especially when wage adjustments are taken into account, Noelke (2011) has recently concluded that 'there is no robust evidence whatsoever linking either dimensions of employment protection legislation to inferior youth labour market performance' (Noelke, 2011: 26). Concerning temporary jobs which have become more common among young people, Noelke found no evidence that deregulating this type of employment reduces youth unemployment. However country-specific employment protection legislation mechanisms might be endogenous to broader differences in country-specific institutional environments which are likewise influential on labour market dynamics (Noelke, 2011: 28).

More or less the same picture emerges at the micro level, with empirical findings still contradictory and sensitive to timing and the methodology used by a country. Scherer (2004), for example, explored the trap or stepping stone metaphor when analysing the consequences of first jobs for future careers. The article shows, however, that the negative effects are not due to the mismatch as such but rather to the relatively low-level positions. These effects are mediated by the national labour market structure, with the British flexible model providing the best chances of making up for initial disadvantages, and the more tightly regulated and segmented markets in Germany and Italy leading to stronger entrapment in lower-status positions. No negative effects of the type of contract are found for later occupational positions in any of the countries. In the late 2000s the effects of temporary jobs on workers were addressed in several papers. According to Gebel (2010), young German temporary workers suffer from high entry penalties in terms of initial wage penalties and risks of temporary employment cycles that diminish after five years. In contrast, in the UK these disadvantages are less pronounced. However temporary jobs have a completely different institutional setting in the United Kingdom compared to Germany. Looking at France, Bucher (2011) shows temporary jobs play a key role in facilitating the matching process and are thus an important component of youth employment. However, the French analysis suggests that employment discrepancies between age-groups are due mainly to the learning process on match quality. As a consequence, the labour market frictions associated with the time-consuming process of allocating workers appropriate jobs generate higher unemployment and recurring job losses at the labour market entry. However, the findings in general are sensitive both to the type of data and the research methodology employed, the timing and observation window available for analysis, and other country-specific settings (Bruno et al., 2012). With regard to this country-specific

variation, Gebel states that there is still a lack of 'quantitative evidence on which institutional and macro-structural conditions explain this variation' (Gebel, 2013: 2).

Alongside employment protection, active labour market policy is a second and highly valued instrument to address youth unemployment. In response to rising youth unemployment figures in the mid-1990s and the development of European social policy (the so-called Luxembourg process), the European Active Labour Market Policy (ALMP) was introduced, based on and coordinated in terms of the European Employment Guidelines (first issued in 1997). These Guidelines include youth-specific goals to prevent or reduce youth unemployment and raise educational attainment. EU Member States agreed in 1997 to implement training and employment schemes for young people in accordance with the Guidelines' goals, and in subsequent years youth schemes became an important policy instrument.

Between 1999 and 2002, EU-15 countries spent an annual average of €1.3bn on ALMP measures specifically targeting unemployed young people (OECD, 2004). In 2007, the number of young ALMP participants in the EU-15 countries amounted to approximately 14 per cent of the youth labour force between 15 and 24 years of age (Caliendo et al., 2011).

ALMP programmes and schemes are thus discussed as a common tool used to prevent the occurrence or reduce the duration of youth unemployment and to smooth young people's path to employment and qualifications. However, the design of ALMP for young people and the related instruments vary considerably within and between countries (Serrano Pascual, 2000; OECD, 2002). Labour market instruments depend on a country's educational and vocational training systems, the constitution of the employment system, the national labour market situation and the welfare system.

Although the primary objective of these programmes is to integrate the young unemployed into the labour market, they may also target the continuation or take-up of vocational training for under-qualified young people. The types of programme in use are manifold, ranging from measures targeting the specific needs of labour market entrants to the use of more 'standard' ALMP policy instruments such as training, wage subsidies or job-creation schemes. The prevalence of youth ALMP schemes – introduced from the mid-1990s onwards – has steadily increased.

As stated by Caliendo et al. (2011), the quantitative importance of ALMP contrasts sharply with the low level of knowledge regarding its effectiveness. Existing evaluation results of youth ALMP schemes in Europe provide a rather heterogeneous picture of programme benefits, suggesting that some of the measures implemented significantly reduce the employment probability of young people in the short to medium term. More evidence on the effectiveness of ALMP schemes for young people is hence urgently needed to enable us to draw lessons for future policy design. Extrapolating evaluation results for the adult workforce is misleading, given the distinctive characteristics of young labour market entrants. Moreover, the assessment of long-term effects is particularly important, as, though ALMP may not affect employment outcomes directly, it may affect decisions whether to participate in longer-term education. This aspect remains blurred on account of both severe methodological limitations and a lack of appropriate data (Heckman et al., 1998; Mroz and Savage, 2006; Caliendo et al., 2011).

Studies of the United Kingdom's New Deal for Young People report that, given alternative programme options, compulsory participation for young people generates endogenous selection effects. The more disadvantaged young people are, the more often they participate in programmes with poorer labour market entry prospects (Devoine, 2005; Van Reenen, 2003). Dolton and Balfour (2000) reported weak regional and demand-dependent effects of the New Deal 18+ programmes, while Dorsett (2006) reports that public sector job-creation schemes implemented in the New Deal for Young People in the United Kingdom were ineffective.

Larsson (2003) summarizes Sweden's Youth Labour Market Programmes. The results of the evaluation point to the programmes having either zero or negative effects on earnings, employment prospects and the probability of entering education in the short term, whereas the long-term effects are mainly zero or slightly positive (Larsson, 2003: 891). Richardson and van den Berg (2013) conclude that the effects of vocational employment training on the hazard rate of a duration outcome (here: re-employment) may depend on the time elapsed since scheme participation. Thus the individual effect of scheme participation diminishes after some weeks. In addition, scheme effects may be heterogeneous across agents. Thus unobserved heterogeneity across agents gives rise to spurious duration dependence of the probability of individuals becoming re-employed.

Fougère et al. (2000) explored three types of French youth programmes: youth employment schemes for out-of-work and low-skilled young adults, on-the-job training schemes, and payroll tax subsidies for minimum-wage workers. Training programmes for unemployed young workers in general have no effect on post-training wages or employment prospects, unless they have a large training content. By contrast, reductions in labour costs (in the French case here, the effect of payroll tax subsidies for minimum-wage workers is addressed) have a significant effect on the employment probability of low-wage workers, although the effects appear to be stronger for workers between 25 and 30 years of age.

Tattara and Valentini (2009) explore the Italian CFL (On-the-job training) Programme, introduced in 1985 to reduce youth unemployment. The programme offered employers two main benefits: it exempted them almost completely from payroll taxes and provided them with virtually the only opportunity to employ people on the basis of fixed-term contracts. The article looks at the employment impact of the programme among a sub-group of eligible workers in the northern Italian provinces of Treviso and Vicenza, finding that participating companies increased employment more than non-participating ones by almost 5 per cent. Employers reacted positively to the tax subsidies and to the softening of the rigid employment regulations. The overall effect of the programme on youth employment in Treviso and Vicenza was, however, limited, with only a 1 per cent increase being registered, mainly because some 80 per cent of companies did not participate (Tattara and Valentini, 2009: 187).

Caliendo et al. (2011) explore different domains of ALMP schemes for young people in Germany. Their findings indicate positive long-term employment effects for nearly all measures aimed at labour market integration. By contrast, measures aimed at getting young people to take up apprenticeships, though effective in terms of educational participation, failed to show any impact on employment outcomes by the end of our observation period. On the contrary, 'public sector job creation is found to be harmful for the employment prospects of participants in the short- to medium-run and ineffective in the long-run' (2011: 22). Caliendo et al. further indicate that the targeting of Germany's ALMP schemes systematically ignores low-educated young people, the most vulnerable labour market group (2011: 23). While no employment programme shows any positive impact on further education participation for any sub-group, the employment impact of participation is often significantly lower for low-educated young people.

In summary, the net effects of youth schemes – as presented in the most recent literature – seem to be scheme-specific and limited in general. Following Caliendo et al. (2011), Richardson and van den Berg (2013) and many others find that the results depend on the data available for analysis and are sensitive to the selected models. According to Schröder (2004), the results suggest that youth programmes play different roles in different countries, and conclusions regarding the relative effectiveness of programmes cannot easily be transferred from one country to another without paying attention to the degree of labour market regulation and the specific features of the education system. Finally there are as yet almost no supranational studies or ones systematically attempting to introduce macro information into the

modelling (see Dolton and Balfour, 2000). The latter would be helpful to find out more on how ALMP youth schemes react to business cycle effects.

However, the effectiveness of youth programmes in terms of the net effects on labour market integration is not supposed to be the only relevant criterion for instituting youth programmes. They also have the purpose of smoothing school-to-work transition, improving qualifications and bridging institutional waiting times (e.g. due to fixed days of entry once a year) without the risk of social exclusion and marginalization, all of which are not generally considered in evaluation frameworks.

Conclusions

Despite a host of literature on youth unemployment, the contributions exploring the mechanism of unemployment still seem to be 'very incomplete' (Blanchard, 2005: 1). Dealing with youth unemployment is characterized by specific complications, not least because jobless, non-employed young people or people not in employment, education or training constitute a less homogenous group than other groups of unemployed. The empirical findings show that different definitions of 'unemployment' respond specifically at least to macroeconomic models, and it is to be assumed that the same conclusion can be drawn from micro or micro-macro models not introduced here. What can however be learned from the macro models introduced here is the need to become more aware of the national aspects of unemployment mechanisms in contrast to supranational aspects. It would be ideal to combine national and supranational attempts. However this would require a richer set of data than that currently available.

From a school-to-work transition perspective the opportunity structure is more complex and individual variance with regard to labour market-related resources is more diverse. School-to-work transition mechanisms differ from one country to the next, as do national and time-specific factors, such as structural change and demographic change over the business cycle. Finally, a school-to-work transition perspective requires more thought to be invested in defining such transition, moving away from an age-based concept as applied here due to data limitations.

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Appendix

Table A1. Sources of data.

Variable	Variable label	Eurostat-Source
Dependant variables		
YUER	Youth unemployment rate	Lfsa_pgaed
YPUER	Youth unemployment ratio	Lfsa_pgaed
NEET	NEET	lfse_20
YAR	YUER/AUER	Lfsa_pgaed
Explanatory variables		
GDP	Annual growth of GBP	Tsieb20
LGDP	Annual growth of GBP-lag t-1	Tsieb20
Inactiveshare	Share of pU25not in the work-force	Lfsa_pgaed
Hedu	Share of Persons with upper secondary or tertiary educational attainment at 15-64 population	Lfse_08
Industry	Share of the employed working in the production sectors (Q2)	Lfsi_grt-q2
Tempant	Share of U25 temporary employed	lfsa_pganws