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Do Business Cycle Conditions at the Time of Labour Market Entry Affect Future Unemployment?

By Oddbjørn Raaum and Knut Røed*

The Ragnar Frisch Centre for Economic Research

Abstract

Labour market conditions at the time and place of potential entry into the labour market are shown to have a substantial and persistent impact on adult labour market performance. Birth cohorts that face particularly depressed labour markets when they graduate from primary- and/or secondary education are – other things equal - subject to relatively high rates of unemployment during their whole prime-age work career. Building on a unique combination of micro- and macro data from Norway, we show that these effects are robust with respect to model-specifications and conditioning variables, and that they are not limited to particularly disadvantaged groups of workers.

Keywords: Unemployment, Marginalisation, Scarring.

JEL Classification: J64.

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1 Introduction

In this paper we examine the *causal* relationship between the state of the labour market at the time(s) of potential or actual entrance into it, and subsequent adult labour market performance. Such a relationship may operate through a number of channels (see e.g. Margolis et al, 2001). First, the state of the labour market may affect the timing of the entry itself. For example, if entry conditions are particularly difficult at the time of secondary school completion, this encourages youths to take more education, since the associated opportunity costs are low[1] (and vice versa). Second, difficult entry conditions imply that a larger number of entrants actually experience a disorderly entry, e.g. in the form of unemployment spells. Unemployment may in turn imply that skills are not accumulated, and perhaps even depreciated, (Pissarides, 1992). Moreover, there may be psychological discouragement effects (Clark et al, 2001), as well as scarring effects (Greenwald, 1986; Lockwood, 1991) at work that impair the labour market competitiveness of persons that are exposed to (much) unemployment. Third, labour market conditions at the time and place of potential school leaving may have a lasting impact on the social norms that are adopted by the directly affected cohorts (Lindbäck, 1995a; 1995b). For example, if a relatively large fraction of a cohort has to rely on social security contributions during the initial stages of their labour market career, it is possible that this permanently affects the way members of this cohort view unemployment (and the social stigma associated with it) later in life.

Existing literature is primarily focused on the second of these causal mechanisms, i.e. the potential impact of actually experiencing a disorderly entry into the labour market.

[1] As pointed out by Micklewright et al (1989), actual unemployment of other household members could pull in the opposite direction, as the fall in household income put a pressure on youths to get a job a job as quickly as possible.

One of the first to investigate the issue was Ellwood (1982). Based on a longitudinal survey of young American men, he found persistent negative effects of unemployment on wages, but 'no evidence that early unemployment sets off a vicious cycle of recurrent unemployment'. More recent European studies seem to produce even stronger results. Franz et al (1997) for example, find that persons moving directly from apprenticeship training into unemployment in Germany are 'punished' permanently for this in the form of lower wages later in life. Rosholm (1997) identifies adverse long-term effects in terms of a raised marginalisation propensity associated with the severe unemployment problems that faced Danish youths during the 1980's. Research conducted on British data also confirms the existence of strong persistence. Gregg (2001) uses the National Child Development Survey (NCDS) and finds that early individual unemployment experiences raise adult unemployment propensity significantly. There is also empirical evidence in favour of a more short-term causal link between lagged- and current unemployment exposure, based on the British Household Panel Survey (BHPS) (Narendranathan and Elias, 1993; Arulampalam, 1998; Arulampalam et al, 2000) and between lagged unemployment exposure and the current wage (Arulampalam, 2001).

The overriding problem in the empirical literature is the *identification of causal effects*, since the existence of unobserved heterogeneity implies that individuals' labour market performance is correlated over time, and since local labour market conditions may be persistent. In principle, these problems can be eliminated if one is able to control perfectly for differences in individuals' attributes and for the state of the labour market they face. But, even if researchers have access to a lot of information about the individuals, some unobserved heterogeneity is likely to remain. In order to 'solve' this problem, one can make assumptions about the distribution of unobserved heterogeneity, and identify the causal effect of interest *conditional* on these assumptions. However, to the extent that

the distributional assumptions are based on convenience rather than prior knowledge, the answers provided by such analyses are unlikely to be considered definitive. A more persuasive form of identification is feasible if one is able to obtain valid *instruments*, i.e. variables that - conditioned on observed covariates - are (strongly) correlated to individuals' early labour market experience, but (completely) uncorrelated to their adult labour market performance. We are aware of two studies that apply this method; both based on survey data. The first is Neumark (2002), who instruments various measures of early labour market stability with aggregate- or local labour market conditions, and finds that early employment stability raises adult earnings substantially. Interestingly, this conclusion runs counter to the non-significant results reported by Gardecki and Neumark (1998), based on exactly the same data and model, but without instrumentation of the early experience. The second application of the instrumental variables approach is Gregg (2001), who uses cross sectional variation in local unemployment rates to instrument early unemployment experience. He finds that early unemployment experience raises adult unemployment propensity, particularly for men. The instrumental variables approach rests on the idea that local labour market conditions at the time of actual entry to the labour market do not influence later performance except through the direct scarring effect. However, if entry decisions and social norms are affected as well, this assumption may be violated.

In the present paper, we put aside the issue of identifying particular transmission mechanisms and adopt a more robust reduced form approach in order to identify a *net causal effect*. The question we ask is the following: To what extent is a cohort's long-term employment prospects affected by the local labour market conditions that prevailed at particular stages in their early life? This question is highly pertinent from a policy point of view, regardless of the exact transmission mechanism. Its answer provides essential information about the long-term costs of national or regional temporary labour market de-

pressions, and the extent to which such depressions require particular counter-measures aimed at the entry-cohorts. In order to provide a reliable answer, we take advantage of a unique Norwegian combined micro/macro longitudinal dataset. The micro part of the data contains information about labour market performance for the whole Norwegian population during the 1990's, while the macro part contains information about local labour market conditions back to 1970. By combining our micro- and macro sources, we are able to identify potential effects of labour market conditions experienced around the ages of 16 and 19 for adult labour market performance up to the age of 36. We focus on the ages of 16 and 19 because for most Norwegians these are the ages at which the first real labour market entrance decisions have to be made (following completion of the compulsory primary school and the secondary school, respectively).

Our approach is similar to that adopted by Burgess et al (1999) who found that high aggregate unemployment at the time of school leaving age tend to impair the labour market performance of low-skilled British workers many years later. However, while Burgess et al (1999) built on Labour Force Survey data, and hence had to rely on restrictive identifying assumptions (e.g. that business cycles at entry have the same impact on labour market performance at all ages), we are able to identify the causal effects of interest with a minimum of parametric restrictions. Our main aim is to provide as indisputable evidence as possible regarding the *existence* and *persistence* of deferred causal effects of labour market conditions during adolescence. Our main findings are that early labour market conditions have causal effects on adult labour market performance, that these effects are quantitatively small at any point in time, but that they are highly persistent and therefore also economically important.

The paper is structured as follows: In the next section, we give a description of the data. Section 3 gives a brief outline of our methodological approach and presents the adult

performance criteria. Section 4 presents the main results regarding the causal effects of labour market entry conditions during adolescence on adult labour market performance. Section 5 summarises the impact on family background variables, while Section 6 looks at the (potential) interaction of family background and entry conditions. Section 7 concludes.

2 Data

The heart of our database is a merged register comprising labour market status for the whole Norwegian population during the 1993-2000 period. From this database, we have selected persons born between 1961 and 1974, and computed various labour market performance criteria at each age from 25-36. These data are merged with other administrative registers providing information about individual demographic factors (age, gender, nationality, current place of residence) and family background variables (parents' education, parents' income during childhood and adolescence, mother's age at first birth, and mother's place of residence). Information about the mother's place of residence is used to identify the municipality in which each person grew up, and hence presumably were positioned to (potentially) enter the labour market[2]. These micro observations are then linked to a dataset containing yearly local unemployment rates (for 454 municipalities) during the period from 1977 to 1993. Finally, we add a dataset containing current local unemployment rates (i.e. at the time and place of adult performance measurement). Hence we identify the labour market conditions that each individual was confronting at the presumed critical moments of graduating from primary- and secondary school, as well as the

[2] The assumption we make is that persons spent their adolescence in the municipality in which their mother lived in 1993 (persons without identifiable mother is deleted from the dataset).

labour market conditions that prevailed at each moment of adult performance measurement.

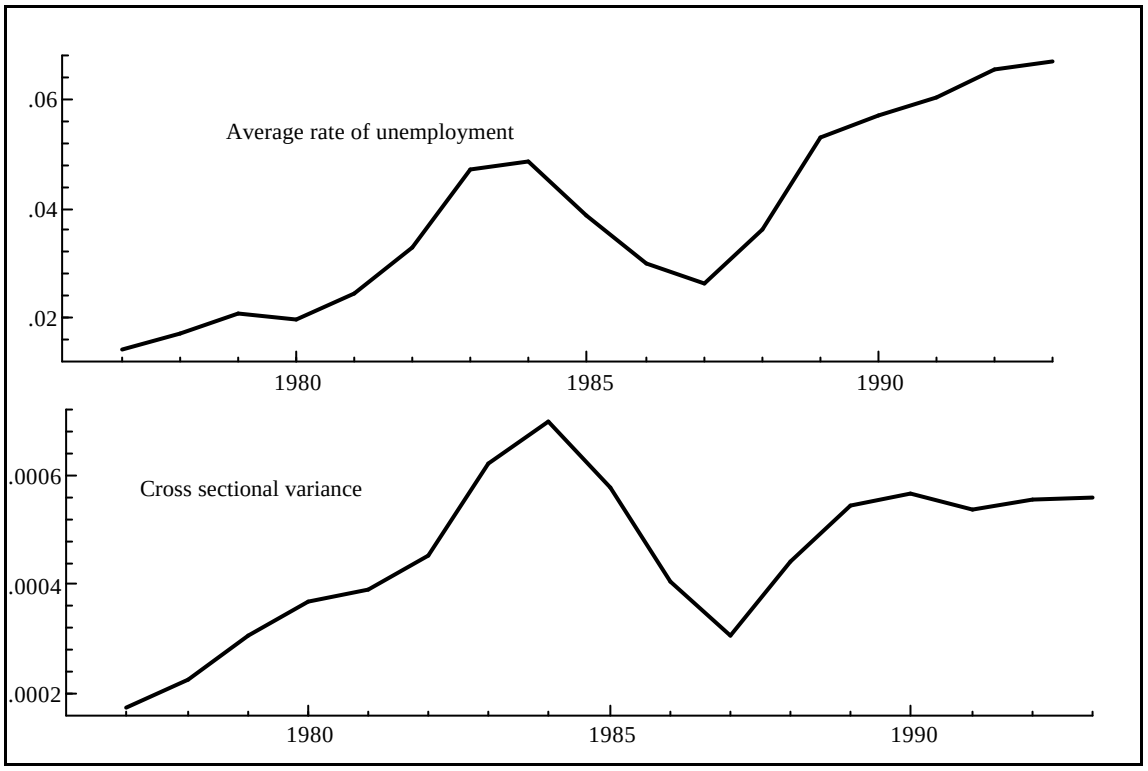

Figure 1. Average unemployment rates in Norway 1977-93 and the within year distribution of unemployment rates across municipalities.

There are two sources of variation in labour market conditions at the time and place of (potential) entry into the labour market: longitudinal variation and cross-sectional variation. A decomposition of the total variance in local unemployment 1977-1993 shows that about 41.4 per cent is explained by year dummies, while 26.5 per cent is explained by fixed county effects. The remaining 33.1 per cent is related to within-county differences and to idiosyncratic business cycle movements. The development of labour market entry conditions over time is illustrated in Figure 1. The upper panel displays the average open unemployment rate in Norway over the relevant time period. It can be seen that unemployment increased sharply during the 1981-84 period, after which a strong, but short-lived, recovery brought it down again. In the period after 1987, employment prospects

deteriorated steadily. As illustrated in the lower panel of the figure, the economic downturn in 1981-84 contained a stronger regional variation (i.e. it hit some areas much harder than others) than the subsequent downturn at the end of the 1980's.

Each birth cohort consists of around 60,000 individuals, and the total number of individuals used in the analysis is around 840,000. The cohort structure of the data is illustrated in Table 1. In total, we have 4,837,079 sets of 'adult performance observations' spread out over the years from age 25 to age 36. Out of these, 318,216 observations (6.6 per cent) are collected from persons who actually left school when they were 16 years old, and 764,575 (15.8 per cent) are collected from persons who left school at age 19.

Table 1
Data Structure and the Sources of Identification

The age at which performance is measured	Cohorts used for identification of effects (birth year)	# cohorts behind identification	# observations	# observations completed education at 16	# observations completed education at 19	Years for potential labour market entrance (age 16/19)	Years in which performance is measured
25	68-74	7	426,152	24,680	75,372	84-90/87-93	93-99
26	67-74	8	484,573	28,094	85,006	83-90/86-93	93-00
27	66-73	8	484,400	28,966	79,949	82-89/85-92	93-00
28	65-72	8	481,178	29,893	76,828	81-88/84-91	93-00
29	64-71	8	473,821	30,634	74,043	80-87/83-90	93-00
30	63-70	8	462,560	30,808	71,362	79-86/82-89	93-00
31	62-69	8	450,192	30,681	69,101	78-85/81-88	93-00
32	61-68	8	433,961	30,371	65,804	77-84/80-87	93-00
33	61-67	7	372,571	26,570	56,150	77-83/80-86	94-00
34	61-66	6	313,417	23,083	46,293	77-82/80-85	95-00
35	61-65	5	255,222	19,177	36,764	77-81/80-84	96-00
36	61-64	4	199,032	15,243	27,903	77-80/80-83	97-00

3 Methodological approach

The main aim of our analysis is to isolate and estimate the causal effect of 'labour market conditions at potential or actual entry' on adult labour market performance. We use three different performance criteria for each adult year, i) the incidence of any form of unemployment, including participation in labour market program and part-time unemployment (a dichotomous variable); ii) the volume of any form of unemployment, measured in

months (a discrete variable running from 0 to 12); and iii) the incidence of labour market marginalisation, defined as at least six months of unemployment and/or occurrence of temporary or permanent disability (a dichotomous variable). For each of these performance criteria, and for each year corresponding to age $\in [25,36]$, we set up an appropriate statistical model (logit for criteria i) and iii); ordered probit for criterion ii)) in order to estimate the effects of 'labour market conditions at potential or actual entry', conditioned on the current state of the labour market and conditioned on a large number of family/background variables.

We estimate these models on three different data sets. First, we look at the effects of local unemployment at the ages of 16 and 19 (both rates entered simultaneously) on adult performance, based on the whole population. We then concentrate on those who actually completed their education at the ages of 16 and 19, respectively (see Table 1), and look at the effects of the unemployment rate at time and place of *actual* labour market entry. The former of these analyses has a sound *causal interpretation*, in the sense that it identifies average persistence effects associated with poor employment prospects during adolescence in the population as a whole. The latter approaches are more questionable in terms of a causal interpretation since the actual school leavers belong to a selected group and since the employment situation at the time of potential school completion may affect the selection process into this group. On the other hand, we would expect that the causal effects (to the extent that they exist) of a high unemployment rate at say the age of 16 are much stronger for those who actually try to enter the labour market at this age than for those who don't.

The individual explanatory variables that we use are (with some minor exceptions) determined prior to the age of 16. The reason for this is that any individual characteristic (such as educational attainment, marital status, work experience etc.) is potentially en-

dogenous, since it also may have been affected by the labour market conditions that prevailed at the time of actual or potential entry. We wish to identify the *total* effects of these conditions, also those that may operate through each individuals' selection of schooling and work experience. To prevent unjustified parametric restrictions from driving our results, we estimate the models separately for each age. In all the models, we include log(unemployment rate) at the time and place of (potential) entry as well as log(unemployment rate) at the time and place of performance measurement[3]. Moreover, all the models contain a large number of variables that describe family background variables. In some cases, we also add sets of dummy variables that capture fixed region- and/or cohort effects. Due to the huge number of estimated parameters, it would be impracticable to report all of them in this paper. We have chosen to present the complete results based on one single adult age and one dataset only (performance at the age of 31 years, based on the complete population) in an Appendix (other results are available upon request). In the following sections, we use a graphical presentation technique to present the parameter estimates of main interest for all the models, ages and datasets. The confidence intervals that we use are calculated with a robust procedure, taking into account that residuals may be correlated within youth municipalities (clustering).

4 The Long Term Effects of Entry Conditions

Figure 2 conveys the main results regarding effects of early labour market entry conditions. The various curves plot the estimated (logit or ordered probit) parameters (with 95 per cent confidence intervals) associated with the log of the unemployment rates at the ages of 16 and 19, for the three different performance criteria and for the three different

[3] The log transformation was chosen because it substantially improved the likelihood of the estimated model.

data sets. Note that for the first and the third criteria (the two logit models), the reported parameters are equal to the elasticities of the probability of being unemployed/marginalised at the moment of performance measurement with respect to the early unemployment rates, divided by the probability of not being unemployed/marginalised. Hence, in order to obtain individual elasticity predictions, the parameter estimates reported in the figure must be multiplied by each individual's probability of not being unemployed/marginalised. The average of these probabilities in the present datasets is around 0.8 (the probability of not being unemployed at all in any given calendar year) and 0.9 (the probability of not being marginalised). For early school leavers (those who left at the age of 16) they are somewhat, but not dramatically, lower (0.75 and 0.83). It follows that the parameter estimates reported in Figure 2 are slightly above the underlying elasticities for all groups, and hence more or less directly comparable.

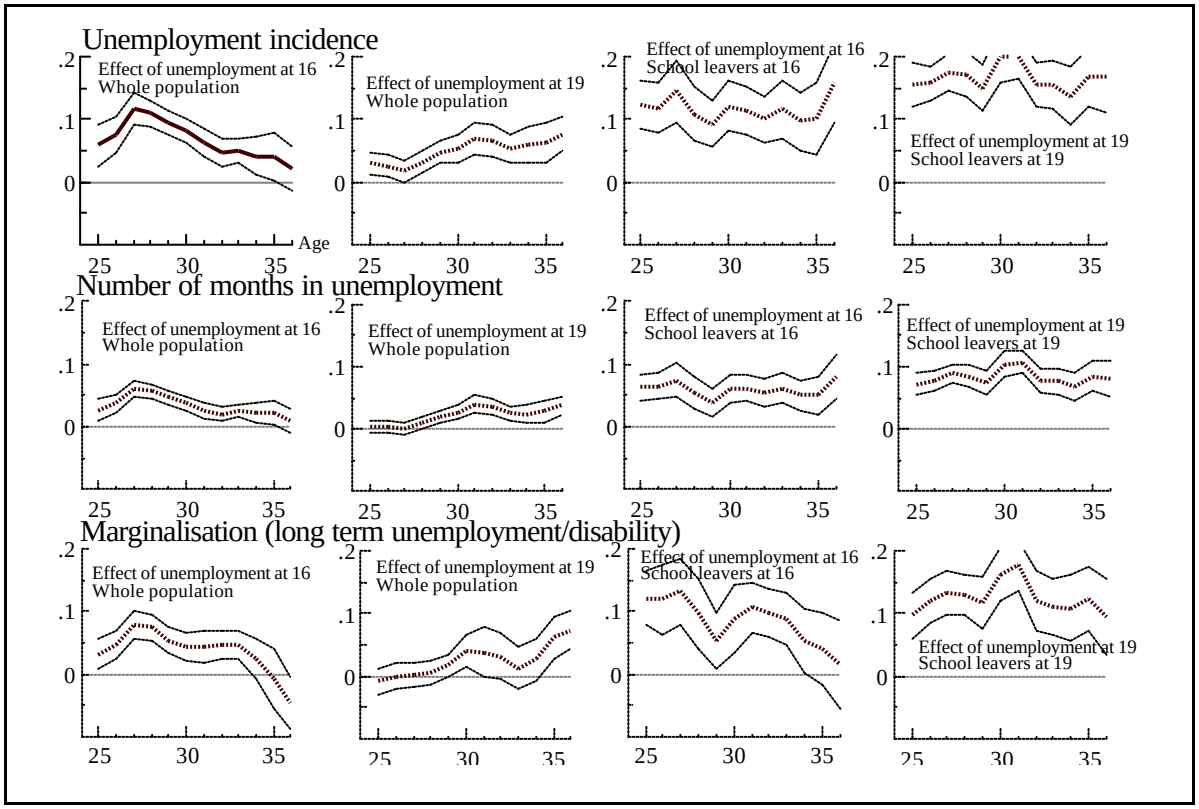

Figure 2. Estimated effect on adult performance of local unemployment rate at age of 16 and 19 (with 95 per cent confidence intervals)

The general pattern revealed by Figure 2 is that the adverse effects associated with difficult labour market conditions during adolescence are *statistically significant* and *long-lasting*, but *not quantitatively large* at any point in time. The confidence intervals are almost in all cases located between zero and 0.2. The three different performance criteria tell very much the same story, although it seems that early labour market conditions have a stronger impact on adult unemployment in general than it has on the more narrow state of 'marginalisation' (long term unemployment and/or disability). Unsurprisingly, the effects are much stronger for those who actually enter the labour market at the ages of 16 or 19 than for those who chose to accumulate more education.

In order to illuminate the *economic significance* of the estimated effects, we take a closer look at the predicted adult unemployment exposure of different hypothetical cohorts who faced different labour market conditions when they were 16 and 19 years old, but who otherwise are *exactly equal*, both in terms of family background and in terms of the adult labour market conditions they face. The hypothetical cohorts are equipped with a vector of background variables equal to the average taken over the complete dataset, and are assumed to face a constant adult rate of unemployment equal to the average rate of (local) unemployment during the observation period, i.e. 4.2 per cent. The only factors that differ between the cohorts are the labour market conditions they faced at the ages of 16 and 19, and we apply the estimated ordered probit model to evaluate the long-term consequences of these differences in terms of adult unemployment exposure.

Figure 3 presents the predicted fraction of time spent in unemployment - the age specific *unemployment rate* - at each adult age, under three different assumptions about (potential) entry conditions[4]. A comparison of the two extreme cases of a boom (1 per

[4] Note that the unemployment concept used as dependent variable in the probit model covers all kinds of unemployment (including participation in labour market programs and part-time unemployment), while the unemployment rates used as explanatory variables measure open full-time unemployment only.

cent local unemployment) and a slump (6 per cent local unemployment) at the times of potential entry indicates that the long-term effects associated with large business cycle movements may be substantial. According to our estimates, the unfortunate slump-cohort is on average subject to 1.5 percentage point (18.3 per cent) higher rate of unemployment than the fortunate boom-cohort throughout their prime-age years (25-36), even though they face exactly the same labour market conditions during these years. In total, members of the slump-cohort are expected to spend 14.3 months in unemployment during these 12 years, while the boom-cohort is expected to spend 12.1 months. Although we are not able to evaluate any effects beyond the age of 36, it seems unlikely that the effect vanishes completely at this point. Hence, from a life-time perspective, the consequences of entry conditions may be even larger than suggested by these numbers.

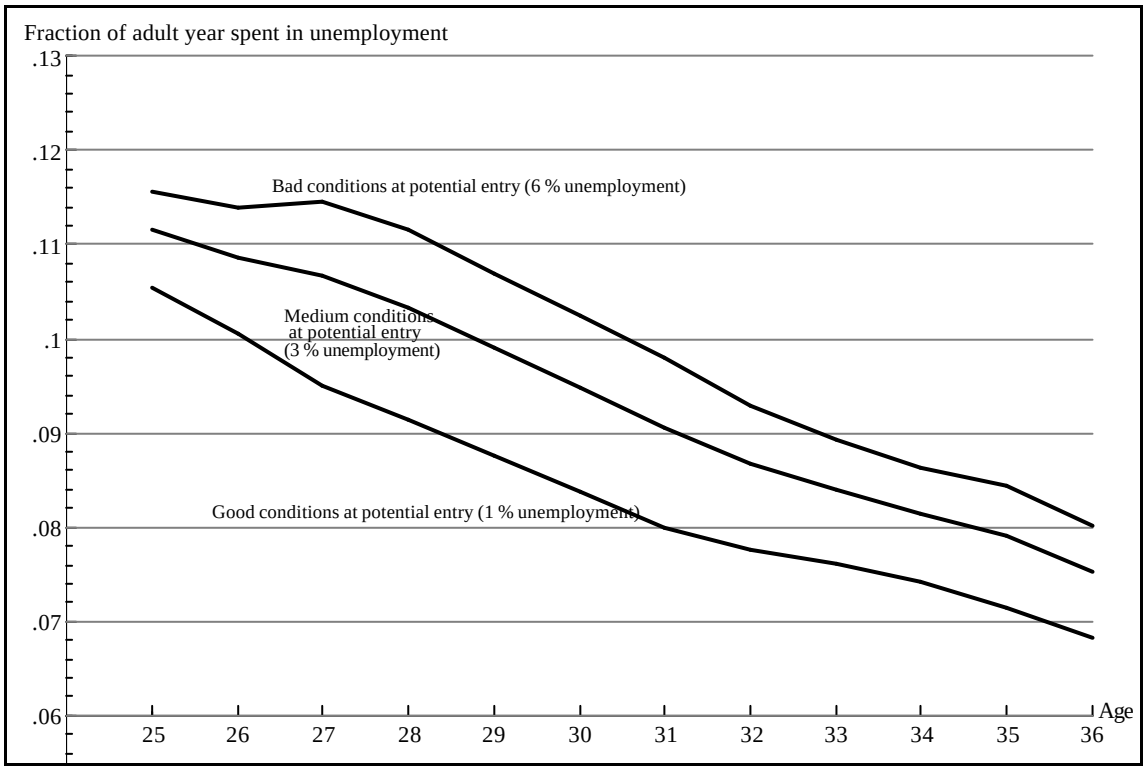

Figure 3. Estimated fraction of adult year spent in unemployment for an 'average person', given three different sets of (potential) entry conditions.

Note: For simplicity we only consider cases for which the rate of unemployment was the same at the two potential entry times. Hence, e.g. 'bad conditions' implies that the local rate of unemployment was 6 percent both at the age of 16 and at the age of 19.

A point to note is that the impact of local unemployment at the time of potential labour market entry can also (partly) explain the apparent 'neighbourhood effects' often encountered in analyses of adult labour market performance, i.e. that children growing up in the same neighbourhood experience earnings resemblance as adults, see survey by Solon (1999) and Norwegian evidence in Raaum et al (2001).

One may worry that the estimates reported in Figure 2 (and illustrated in Figure 3) could be contaminated by fixed regional- or cohort effects that are correlated to adolescence unemployment rates. For example, a region may be characterised by a persistent labour market situation that is not completely accounted for by the use of the current rate of unemployment as a control variable. In order to take this possibility into account, we re-estimated the model with the inclusion of fixed regional effects (for the 19 counties in Norway) and fixed cohort effects (for the 14 cohorts). In this process, we also removed two thirds of the variation in early entry conditions (ref. Section 2); hence the parameters are estimated with less precision. The results are displayed in Figure 4. They reveal that the qualitative conclusions discussed above still go through, although the point estimates indicate weaker causal effects. This may indeed reflect that idiosyncratic variation in entry conditions have less impact on individuals' future than e.g. national business cycles, since some of the problems associated with high local unemployment can be avoided by taking a job in another municipality.

As an additional check for robustness, we also re-estimated the model with local unemployment rates that we *knew* were causally irrelevant, i.e. we included the local unemployment rate at the time and place of the sixth birthday. Unsurprisingly the estimated coefficients attached to this variable were typically very close to (and not significantly different from) zero.

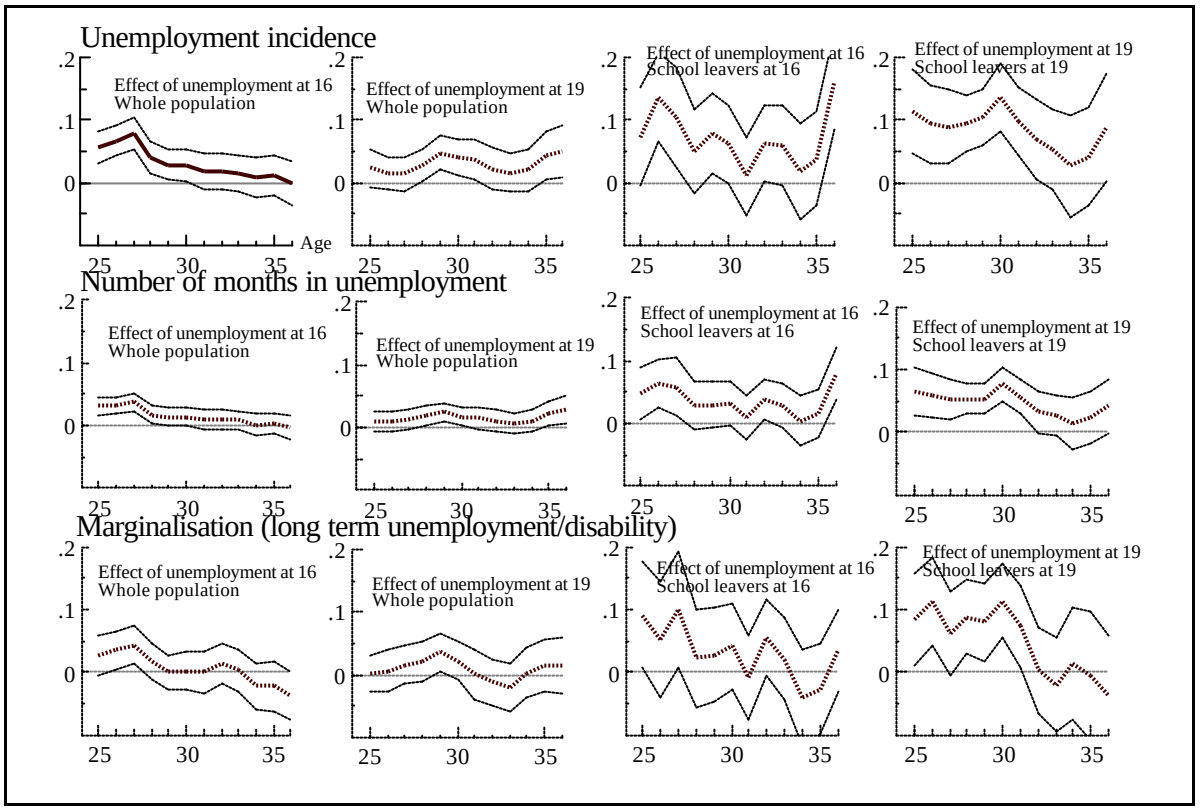

Figure 4. Estimated effect on adult performance of local unemployment rate at age of 16 and 19, conditioned on region- and cohort dummies (with 95 per cent confidence intervals)

5 Family Background and Adult Unemployment

In this section we show that the impact of entry conditions is small compared to the impact of family background. Family background has a substantial and persistent impact on adult performance. This is illustrated by the results presented for performance at the age of 31 in the Appendix. In order to portray the whole range of estimated family background effects in an informative, but still compact way, we have used the ordered probit results to predict cohort unemployment rates at each age, for a number of archetype individuals. These archetype individuals are characterised by a mean value of all explanatory variables (including unemployment rates), except those related to parents' education and income (and teenage mothers). The predictions are shown in Figure 5. They reveal that family background not only has a huge impact on unemployment exposure, but also that these effects are highly persistent. At the age of 25, the predicted unemployment rates

ranges from around five per cent (for persons with the 'most advantaged' family background) to almost 19 per cent (for those with the 'most disadvantaged' background). And in relative terms, there is no indication that the issue of family background becomes less important as the persons approach the age of 36.

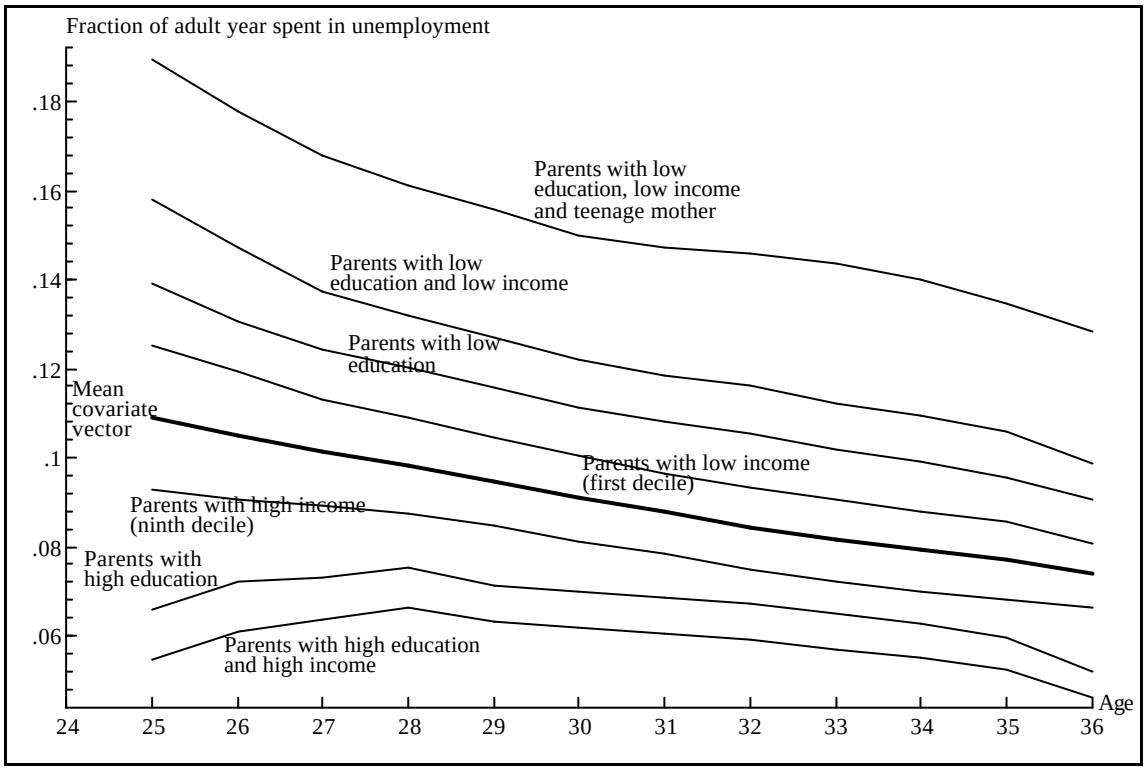

Figure 5. Estimated fraction of adult year spent in unemployment for different archetype individuals.

Note: Low (high) income implies that the parents belonged to the first (ninth) decile in the distribution of average yearly incomes during the persons childhood. Low education implies that both parents only have compulsory education, while high education implies that both parents have a University degree. Covariates that are not mentioned are set to their mean value.

6 Interaction of Entry Conditions and Individual Resources

Previous evidence (Burgess et al, 1999) suggests that the causal effect of early unemployment may depend heavily on individual resources, such that low-skill persons are more strongly affected than high-skill persons. Now, a fundamental difficulty with respect to evaluating this claim is that human capital skills are not yet determined (or revealed) when persons are 16 or 19 years old. And by conditioning on the adult skill-level (as Burgess et al, 1999, do) one may very well induce endogeneity bias into the model, since the

selection of skill-level is likely to have been affected by the labour market conditions in the potential entry period. In order to solve this problem, we build up a separate (ordered probit) model for the purpose of predicting individual educational attainment as a function of family background variables only. From this model, we obtain a continuous 'score' function which is linear in the vector of family background variables and which takes a higher value the higher is the predicted educational attainment. We then divided the population into three groups according to each person's position in the score distribution; i) the lowest decile; ii) decile 2-9; and iii) the upper decile. The groups turned out to be very different in terms of family background. For example, in the bottom decile, around 90 per cent had a father with only compulsory education and only 0.003 per cent had a father with a university degree. In the top decile, less than two per cent had a father with only compulsory education and around 65 per cent had a father with a university degree. Similar differences apply to the mothers' education and to family income (during childhood and adolescence). And while 20 per cent of the persons in the bottom decile was born by a teenage mother, this was the case for only 0.6 per cent of the persons in the top decile. Building on this grouping, the three performance models were re-estimated with separate 'early unemployment effects' for each group. Figure 4 presents the results regarding the two extremes, i.e. the bottom- and the top deciles. They clearly reject the idea that persons with a 'disadvantaged' background are more strongly affected by early labour market conditions than persons with a 'advantaged' background[5].

[5] We have also estimated the models with all parameters determined separately for each group (i.e. completely separate models). This yielded similar results.

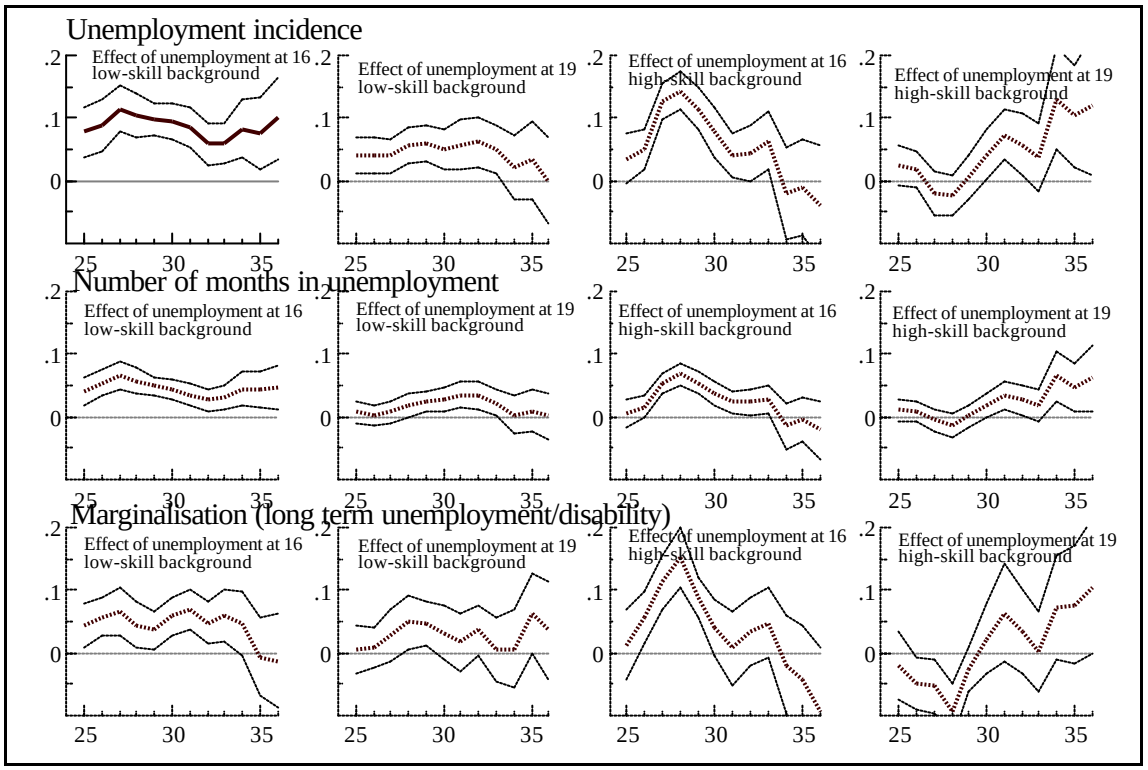

Figure 4. Estimated effect on adult performance of local unemployment rate at age of 16 and 19 for persons in the bottom- and top decile of the educational scores distribution (with 95 per cent confidence intervals)

7 Concluding remarks

In this paper, we have used a unique combination of Norwegian micro- and macro data to empirically establish the causal link between early (youth) labour market conditions and adult labour market performance. Based on results from a large number of flexible model specifications, we conclude that the existence of such a linkage is established beyond reasonable doubt. There is no evidence whatsoever that the linkage is limited to particularly disadvantaged groups, such as the 'low-skilled'. Its precise impact may vary, though, depending on the sources behind the variation in entry conditions.

The evidence presented in this paper suggests that 'deferred business cycle effects' are economically important. A business cycle slump occurring at particularly 'critical moments' in young people lives may raise their adult (prime age) rates of unemployment

with as much as 1-2 percentage points, ceteris paribus. Hence, the social costs associated with macroeconomic instability may be much larger than indicated by the contemporary occurrence of social distress and loss in output.

Adult unemployment is highly correlated with economic resources of the family during childhood, with parental education and the mother's age at the time of birth. Unemployment exposure is more than three times higher for persons with the highly disadvantaged background compared to those from the most advantaged families.

Appendix

In this Appendix, we present the complete results from the estimations based on the complete dataset for the three different performance criteria at the age of 31. We also present some summary statistics for the persons that contribute to the identification of the 31-year effects.

Table A1
Descriptive Statistics and Estimation Results Regarding Adult Performance at the age of 31

		Unemployment incidence (logit)		Total unemployment (ord. probit)		Marginalisation (logit)	
	Mean	Estimate	Robust S.E.	Estimate	Robust S.E.	Estimate	Robust S.E.
Dependent variables							
Unemployment incidence	0.177						
Total unemployment (months)	1.149						
Marginalisation	0.118						
Local unemployment rates							
Log unemployment at age 16	-3.989	0.06	0.01	0.03	0.01	0.04	0.01
Log unemployment at age 19	-3.785	0.07	0.01	0.04	0.01	0.04	0.02
Log unemployment at age 31	-3.218	0.66	0.02	0.36	0.01	0.63	0.02
Family characteristics							
Father's education < 7	0.001	-0.18	0.12	-0.11	0.06	-0.09	0.13
Father's education 7-9	0.298	ref.	ref.	ref.	ref.	ref.	ref.
Father's education 10-12	0.419	-0.15	0.01	-0.08	0.01	-0.17	0.01
Father's education 13-15	0.084	-0.16	0.02	-0.09	0.01	-0.22	0.02
Father's education 16+	0.077	-0.20	0.02	-0.11	0.01	-0.25	0.02
Father's education missing	0.131	0.05	0.01	0.03	0.01	0.02	0.02
Mother's education < 7	0.002	0.15	0.10	0.10	0.06	0.25	0.09
Mother's education 7-9	0.39.7	ref.	ref.	ref.	ref.	ref.	ref.
Mother's education 10-12	0.479	-0.19	0.01	-0.11	0.00	-0.23	0.01
Mother's education 13-15	0.078	-0.32	0.02	-0.17	0.01	-0.34	0.03
Mother's education 16+	0.044	-0.27	0.03	-0.15	0.01	-0.32	0.03
Parents' income (age 0-16)	2.089	-0.12	0.01	-0.07	0.00	-0.14	0.01

Table A1
Descriptive Statistics and Estimation Results Regarding Adult Performance at the age of 31

		Unemployment incidence (logit)		Total unemploy-ment (ord. probit)		Marginalisation (logit)	
	Mean	Esti-mate	Robust S.E.	Esti-mate	Robust S.E.	Esti-mate	Robust S.E.
Mother's age at birth < 20	0.068	0.12	0.02	0.06	0.01	0.12	0.02
Mother's age at birth 20-22	0.199	0.15	0.01	0.08	0.01	0.15	0.01
Mother's age at birth 23-25	0.222	0.08	0.01	0.04	0.01	0.06	0.01
Mother's age at birth 26-29	0.226	ref.	ref.	ref.	ref.	ref.	ref.
Mother's age at birth gt 29	0.287	-0.06	0.01	-0.03	0.01	-0.04	0.01
Teenage mother (first child)	0.163	0.21	0.01	0.11	0.01	0.23	0.02
Individual characteristics							
Male	0.509	-0.07	0.01	-0.06	0.01	-0.16	0.01
Teenage parent male	0.002	0.45	0.07	0.25	0.04	0.48	0.08
Teenage parent female	0.016	0.54	0.03	0.30	0.01	0.51	0.03
1. gen immigrant, OECD	0.002	0.20	0.10	0.10	0.06	0.14	0.11
1. gen immigrant, Non-OECD	0.005	0.39	0.12	0.22	0.06	0.37	0.06
2. gen immigrant, OECD	0.001	-0.07	0.13	-0.02	0.07	0.10	0.16
2. gen immigrant, Non-OECD	0.000	0.48	0.20	0.24	0.10	0.39	0.21
Foreign born adopted	0.001	0.30	0.10	0.18	0.06	0.51	0.10
Other immigrant[#]	0.005	0.18	0.02	0.10	0.01	0.15	0.02
Constant		1.45	0.10			0.81	0.10
Cut 1				-071	0.05		
Cut 2				-0.62	0.05		
Cut 3				-0.53	0.05		
Cut 4				-0.45	0.05		
Cut 5				-0.38	0.05		
Cut 6				-0.30	0.05		
Cut 7				-0.23	0.05		
Cut 8				-0.15	0.05		
Cut 9				-0.08	0.05		
Cut 10				-0.01	0.05		
Cut 11				0.07	0.05		
Cut 12				0.17	0.05		
Log likelihood		-204197.1		-392774.0		-158178.9	
Number of observations	450192						

[#]Foreign born with at least on Norwegian born parent or Norwegian born with at least one foreign parent.

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