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NORDIC ECONOMIC POLICY REVIEW

LABOUR MARKET CONSEQUENCES OF THE ECONOMIC CRISIS

NUMBER 1 / 2011


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Labour Market Consequences of the Economic Crisis

Editors: Lars Calmfors and Bertil Holmlund

TemaNord 2011:544

Nordic Economic Policy Review Number 1 / 2011
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ISBN 978-92-893-2251-5
ISSN 1904-4526

Print: Arco Grafisk A/S, Skive
Cover: Jette Koefoed/Pub.Unit/NCM
Copies: 5000

Printed on environmentally friendly paper
This publication can be ordered on www.norden.org/order. Other Nordic publications are available at www.norden.org/publications

Printed in Denmark

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Foreword

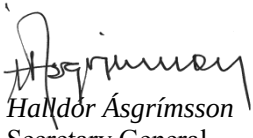
The *Nordic Economic Policy Review* is designed to make research into economic policy more useful to policy makers and to promote more widespread discussion of economic policy in the Nordic countries.

The *Review* is published by the Nordic Council of Ministers and addresses policy issues in a manner that is useful both for informed non-specialists and for economists. All of the articles are commissioned from leading economists and are subject to peer review prior to publication. It is published twice a year and each edition is discussed at a seminar before publication.

The theme of this edition is "Labour Market Consequences of the Economic Crisis" – a highly topical issue in the Nordic Region and beyond. Youth unemployment, job-sharing schemes and unemployment insurance are just some of the issues analysed and discussed in this edition.

I would like to express my warmest thanks to all of the authors, to Professor Lars Calmfors and Professor Bertil Holmlund for acting as co-editors of this edition, and to Professor Mats Persson the permanent editor-in-chief of the *Nordic Economic Policy Review.*

The analyses and the conclusions reached in the *Review* are those of the authors and do not necessarily reflect the views of the Councils of Ministers. However, I am convinced that the *Review* will enhance our knowledge and understanding and raise the level of the discussions about the consequences on the current economic crises for the labour market.



Halldór Ásgrímsson
Secretary General
Nordic Council of Ministers

Content

Introduction

Lars Calmfors[*] and Bertil Holmlund[**]

This second volume of the *Nordic Economic Policy Review* includes six papers dealing with various labour market aspects of the economic crisis in 2008-2010. More specifically, the following topics are covered:

- Youth unemployment
- Employment protection
- Unemployment insurance
- Short-term work schemes
- Active labour market programmes
- Regular education as a stabilisation policy tool

Youth unemployment

There has been a great concern about high youth unemployment in the last recession. *David Bell and David Blanchflower* document the developments of youth unemployment in various countries. Using UK data, they find that measures of happiness are affected less by being unemployed for young than for older people. At the same time, the authors present evidence that unemployment when young gives more permanent scars in terms of lower wages in the future than unemployment when older. This is a provoking result, which seems to contradict earlier findings that unemployment has smaller effects on future employment probabilities for young than for older people.

Employment protection

Per Skedinger's survey of research on employment protection basically confirms the conventional wisdom that stringent employment regulations

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have little influence on aggregate employment and unemployment, but that they do reduce labour turnover and increase youth unemployment. Another conclusion is that liberalisation of regulations regarding temporary employment may not be very effective for creating more jobs in general, although it will change the balance between temporary and regular employment in a way that could be welfare-reducing.

Cyclically dependent unemployment insurance

Torben Andersen and Michael Svarer analyse the potential benefits of making the generosity of unemployment insurance dependent on the business cycle as is the case in Canada and the US. There are two arguments for a more generous insurance in recessions than in booms: the "need" for high benefits is greater when it takes a long time to find a new job, and the adverse effects on job finding are smaller when there are few vacancies available. According to Andersen and Svarer, cyclically dependent benefits are likely to offer employees a better insurance without raising the equilibrium rate of unemployment.

Short-term work schemes

Pierre Cahuc and Stephane Carcillo provide theoretical arguments for why it may be socially efficient to combine ordinary unemployment insurance with government subsidisation of short-time work in a recession: the external effects of excessive layoffs are not internalised by employers. Empirical support is found for the hypothesis that unemployment increases in the recession were held down by such subsidisation arrangements.

Active labour market programmes

Anders Forslund, Peter Fredriksson and Johan Vikström ask how active labour market programmes should respond to the business cycle. They explain why this is a very difficult research question: there is a fundamental selection bias problem because the composition of programme participants varies over the cycle. Still, the paper concludes that labour market training is relatively more efficient in downturns (because lock-in effects

matter less then) and job-search activities relatively more efficient in upturns (when they have a high pay-off in terms of job finding).

Regular education as a stabilisation policy tool

Christopher Pissarides analyses the potential of variations in regular university education as a stabilisation policy tool. His conclusion is that countercyclical variation in such education is indeed desirable. But he also points to the risk that regular education is overexpanded in recessions because it is used to substitute for the provision of unemployment insurance for entrants into the labour market.

Need for future research

The six papers add to our knowledge of employment policy. But as all good papers, they also pinpoint areas where more research is needed. They include:

- The cost of unemployment for youth versus the cost fo unemployment for older age groups.
- The effects of unemployment insurance and various types of active labour market programmes in different phases of the business cycle.
- The trade-off between unemployment reductions in recessions through short-term work schemes and structural change.
- The long-run effects of short-term variations in the volume of regular education.

Youth unemployment in Europe and the United States*

*David N.F. Bell*** *and David G. Blanchflower****

Summary

This paper focuses particularly on youth unemployment, why we should be concerned about it, why it is increasing again, how the present difficulties of young people entering the labour market differ from those of the past and what useful lessons have been learned that may guide future policy. We focus on Europe and USA, but introduce evidence from other countries where appropriate. Our analysis of the UK NCDS birth cohort data provides evidence supporting the notion that early adulthood unemployment creates long lasting scars which affect labour market outcomes much later in life. Our chosen variables are weekly wages and happiness. Our results show significant effects at the age of 50 from early adulthood unemployment. These effects are stronger than those of more recent unemployment experiences.

Keywords: Youth unemployment, scarring effects, happiness.
JEL classification numbers: J31, J64.

* Thanks to Lars Calmfors, Bob Hart, Stephan Heblich, Bertil Holmlund, Chris Pissarides, Oskar Nordström Skans and Doug Staiger for helpful comments.

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"Young people have suffered a disproportionate share of job losses during the global economic crisis. Many governments have boosted spending on programmes to help them. But with the economic recovery still fragile and fiscal pressures mounting, *there are concerns that many will be left behind and could face years of unemployment*."

Off to a good start? Jobs for youth, OECD, December 2010.

Youth unemployment is one of the most pressing economic and social problems confronting those countries whose labour markets have weakened substantially since 2008, following the near-collapse of worldwide financial markets. There is an element of déjà vu around this development: youth unemployment first became a serious problem for industrialized countries during the 1980s. While labour markets were booming in the early part of this century, youth unemployment was still a concern. But the particularly rapid increase in youth unemployment during the current recession has once more sharpened the attention on this issue.

This paper particularly focuses on youth unemployment: why we should be concerned about it, why it is increasing again, how the present difficulties of young people entering the labour market differ from those of the past and what useful lessons have been learned that may guide future policy. We focus on Europe and the US, but introduce evidence from other countries where appropriate.

Table 1 presents evidence on the increase in quarterly youth unemployment rates over the recession. In the EU as a whole, the rates have increased from 14.7 per cent at the beginning of 2008 to over 20 per cent in 2010Q3.[1] Youth unemployment has risen sharply over this period in Estonia (+20.7), Ireland (+18.4), Latvia (+23.2), Lithuania (+26.1) and Spain (+21.6), with percentage point increases in parentheses. Interestingly, in all these countries there have been sharp declines in house prices over the Great Recession. A direct link to the youth labour market may derive from the disproportionate number of the young who work in construction, which has suffered particularly from the effects of property price bubbles.

[1] According to the OECD youth unemployment (ages 15-24) also increased in Australia (2008 = 8.9 per cent; 2009 = 11.6 per cent); Canada (11.2 per cent and 15.3 per cent); Japan (7.2 per cent and 9.1 per cent); Korea (9.3 per cent and 9.8 per cent).

Table 1. Quarterly youth unemployment rates, 2008Q1-2010Q3 (%)

	2010Q3	2010Q1	2009Q1	2008Q1
EU (27)	20.3	20.7	18.4	14.7
Euro area (16)	20.0	20.2	18.4	14.7
Austria	8.6	9.6	9.3	8.2
Belgium	23.5	23.8	21.0	17.3
Bulgaria	20.8	22.1	13.5	13.8
Cyprus	20.8	18.7	10.9	9.1
Czech Rep.	17.7	19.3	12.8	10.0
Denmark	14.7	13.4	9.1	7.2
Estonia	28.1	39.6	24.0	7.4
Finland	20.7	22.5	18.8	15.9
France	24.2	23.4	22.9	17.9
Germany	8.8	9.9	10.1	10.2
Greece	32.1	29.7	24.4	22.5
Hungary	27.2	27.0	24.6	19.7
Ireland	28.5	27.1	20.5	10.1
Italy	28.2	27.5	24.3	20.7
Latvia	34.0	39.0	27.8	10.8
Lithuania	35.3	34.1	23.6	9.2
Luxembourg	18.4	17.4	18.6	15.4
Malta	12.1	13.9	14.2	11.5
Netherlands	8.7	8.9	6.7	6.2
Norway	8.3	8.9	8.6	6.8
Poland	22.8	23.3	18.1	17.8
Portugal	23.0	21.9	19.1	15.8
Romania	21.4	21.0	20.2	18.5
Slovakia	32.0	32.9	22.3	19.1
Slovenia	15.6	13.2	12.6	11.2
Spain	42.4	39.9	34.7	20.8
Sweden	24.8	26.3	22.5	18.9
Turkey	19.3	21.1	22.8	17.0
UK	18.9	19.7	17.9	13.8
US	18.2	18.7	15.7	11.5

Source: Eurostat.

Some countries have been notably successful in keeping youth unemployment down. Strikingly, Germany has actually experienced a decrease in youth unemployment rates, from 10.2 per cent in 2008Q1 to 8.8 per cent in 2010Q3. The general impact of short-term working subsidies and the particular effects on the youth labour market of the German system of dual vocational training are candidate explanations for this success.

Of particular concern is the rising number of young people disconnected from both education and the labour market. On average in the OECD, almost 11 per cent of all young people aged 15-24 were NEET (Not in Education nor in Employment or Training) in 2008. 33 per cent of these had been unemployed for less than a year, 7 per cent were unem-

ployed for more than a year, and 60 per cent were inactive without studying.

Recent data up to the second quarter of 2010 suggest that during the last two years, the NEET proportion among the population aged 15-24 increased by almost two percentage points in OECD countries and in Europe. The OECD (2010) noted that by mid-2010 in the 26 OECD countries where data are available, the proportion of youth aged 15-24 who were not in education, employment or training, stood at 12.5 per cent of the total population aged 15-24, up from 10.8 per cent in 2008. This represents 16.7 million young people, 10 million of whom were inactive and not studying, and 6.7 million of whom were unemployed. The OECD projects that youth unemployment rates will remain high at around 18 per cent in 2011 and 17 per cent in 2012 after a small decline in 2010.[2]

To analyse the increase in youth unemployment, we examine the most recently available micro-data files to paint a picture of unemployment in general and youth unemployment in particular across countries on a comparable basis controlling for personal characteristics. These are mostly based on survey responses by individuals, but we also make use of a company level survey in Europe. Strikingly, the influences on the likelihood of an individual being unemployed are very similar across most countries and over time.

We find that youth unemployment has broadly similar features across countries, being heavily concentrated among the least educated. However, young people are optimistic about the future and particularly happy. Unemployment reduces the happiness of the young, but less so than it does for older workers. In part, this may arise from the fact that a high proportion of young people in many countries continue to live with their parents, which may lessen the impact of being unemployed (Card and Lemieux, 2000; Cheri and Del Boca, 2008). Despite this, we find evidence that spells of unemployment when young tend to leave permanent scars.

A great deal of what is known about the youth labour market comes from a series of research volumes published by the National Bureau of Economic Research. These were based primarily, but not exclusively, on research done in the United States (Freeman and Wise, 1984; Freeman

[2] OECD youth unemployment rates were 2002 = 13.4 per cent; 2003 = 13.8 per cent; 2004 = 13.7 per cent; 2005 = 13.4 per cent; 2006 = 12.5 per cent; 2007 = 12.0 per cent; 2008 = 12.7 per cent; 2009 = 16.4 per cent. Source: OECD. http://www.oecd-ilibrary.org/employment/youth-unemployment-rate_20752342-table2.

and Holier, 1986; Blanchflower and Freeman, 2000). The OECD has updated the evidence on youth through its recent analysis of youth labour markets in sixteen countries.[3]

1. The effects of the Great Recession on youth labour markets

1.1 Overall developments

Table 2 reports what impact the recession has had on some of the mature economies. It shows how GDP by country changed from the first quarter of 2008 to the third quarter of 2009 – the period generally associated with the "recession" phase. It also shows the extent of growth during the "recovery" phase – which thus far stretches from the fourth quarter of 2009 to the second quarter of 2010.

Some countries, such as the Baltic States and Ireland, suffered double-digit falls in output. The output of the European Union as a whole fell by 4.6 per cent during this recessionary phase – a sharper fall than the 3.8 per cent drop in output experienced in the United States. The recovery has been less strong in some parts of Europe than it has been in the US, in terms of the proportion of the drop in GDP that has since been recovered – by 2010Q2, output in the EU was still 3 per cent below its level at the start of 2008. In Western Europe, Germany, Denmark and Sweden have experienced rapid growth, but growth in Spain, Italy, Ireland and France has been much weaker.

Table 2 also includes information on changes in employment from the start of the recession (2008Q1) to the most recently available observation (2010Q2). Employment in the European Union fell by 1.3 per cent over this period. Once more, in some countries, the change has been much more dramatic with Ireland, Latvia and Lithuania and Estonia experiencing double-digit reductions in employment. In contrast, some countries

[3] Studies are available in Australia, Belgium, Canada, Denmark, France, Greece, Japan, Korea, the Netherlands, New Zealand, Norway, Poland, the Slovak Republic, Spain, the UK and the USA at http://www.oecd.org/document/59/0,3343,en_2649_34747_38019131_1_1_1_1,00.html.

have experienced small *increases* in employment. These include Germany, Austria, Sweden and Norway.

Table 2. Employment and GDP changes in the great recession (%)

	Employment change 2008Q1-2010Q2	GDP change 2008Q1-2009Q3	GDP change 2009Q4-2010Q2
EU	-1.3	-4.6	1.6
Euro area	-1.6	-4.2	1.5
Austria	1.6	-2.9	1.6
Belgium	-0.2	-1.9	1.3
Bulgaria	-6.6	-1.6	-0.2
Croatia	-3.6	-5.1	-1.3
Cyprus	2.1	-0.4	0.7
Czech Rep.	-1.6	-3.3	1.8
Denmark	-2.7	-6.6	2.6
Estonia	-14.9	-22.3	4.4
Finland	0.5	-8.4	2.3
France	0.3	-3.1	1.5
Germany	0.7	-4.1	3.0
Greece	-1.9	-1.1	-3.4
Hungary	-1.7	-7.1	0.6
Iceland	-3.2	-7.6	-4.6
Ireland	-12.9	-12.6	-1.5
Italy	-0.7	-6.2	0.8
Latvia	-17.7	-26.8	0.5
Lithuania	-12.1	-15.5	0.4
Luxembourg	10.3	-3.9	0.9
Malta	4.9	-0.1	2.5
Netherlands	0.5	-3.9	2.1
Norway	0.9	-2.3	0.4
Poland	3.1	4.2	3.0
Portugal	-3.8	-3.0	1.3
Romania	4.1	-2.8	-1.5
Slovakia	-3.3	-4.2	3.7
Slovenia	-0.3	-7.0	1.1
Spain	-9.4	-4.4	0.1
Sweden	0.8	-6.9	4.0
UK	-1.7	-6.2	2.0
US*	-7.9	-3.8	2.5

Source: Eurostat.

Note: * January 2008-September 2010.

While all of the mature economies were affected by the financial crisis, the responses of both their product and labour markets have been very diverse. And indeed, while there is a general correlation between changes in output and changes in employment across countries, it is by no means uniform. Thus, for example the US and Spain both experienced falls in output of around 4 per cent during the recession. Employment in the US fell by almost 8 per cent and in Spain it fell by 9.4 per cent. In contrast,

output in the UK dropped by 6.2 per cent, but employment fell by only 1.7 per cent. And there is an even greater contrast with Sweden, where output fell by 6.9 per cent between 2008Q1 and 2009Q3, but employment actually grew between 2008 and 2010.

For the EU as a whole, the overall fall of 1.3 per cent in employment during the recession comprises a 2.5 per cent reduction in full-time employment and a 4.2 per cent *increase* in part-time employment. In the US, the response is even starker, with full-time employment falling by 7.9 per cent while part-time employment *increased* by 10.1 per cent. Reductions in hours of work as a response to the recession in the UK have been documented in Bell and Blanchflower (2010, 2011). They find that many workers would prefer to work longer hours, but that employers are unwilling to purchase these hours. However, reduced hours may still be a rational strategy for both employers and employees who do not wish to dissipate the specific human capital that they may have jointly accumulated. They also find that not only is unemployment prevalent among the young, so is *underemployment*.

1.2 Youth unemployment

The young do not generally possess much specific human capital. As a result, it is perhaps not surprising that they have been particularly affected by this recession. There is evidence that the youth labour market is especially volatile. When aggregate unemployment increases, youth unemployment tends to rise as firms cease hiring. This hurts new entrants. If firms decide to reduce their workforce and use last-in first-out (LIFO) rules to determine who is made redundant, the young are often the first to be fired. The recession has made it particularly difficult for young people to make a successful transition from school to work.

The first panel of Table 3 presents data on the relationship between youth and adult unemployment rates. The second panel shows unemployment rates for all ages. First, it is clear that youth unemployment rates are always higher than adult rates in every country. Second, the ratio of youth to adult rates tended to rise in 2008 as national unemployment rates started to rise. Subsequently, in most countries youth unemployment rates have stabilized or fallen back slightly, perhaps as a result of specific government policies to help younger workers.

Table 3. Ratio of youth to adult annual unemployment rates and national unemployment rates, 1983-2010

	Oct. 2010	2008	2005-7	2000-4	1990-4	1983-4
a) Ratios of age <25 unemployment rate to age 25-74 unemployment rate						
Belgium	3.28	3.05	2.98	3.01	2.74	3.02
Denmark	2.49	3.04	2.33	1.80	1.49	2.33
Germany	1.33	1.43	1.38	1.09	1.21	
Ireland	2.38	2.61	2.40	2.24	1.83	1.76
Spain	2.34	2.51	2.54	2.73	2.99	
France	3.01	2.94	2.78	2.58	2.85	4.00
Italy	3.79	3.79	3.98	3.41	4.57	7.22
Netherlands	2.36	2.63	2.16	2.24	1.45	1.71
Portugal	2.25	2.41	2.36	2.74	3.13	4.05
Finland	3.37	3.37	3.01	2.80	3.02	
Sweden	4.21	4.88	4.20	3.16	3.18	3.48
UK	3.24	3.85	3.85	3.22	1.94	2.30
US	2.27	2.78	2.89	2.77	2.46	2.34
b) Total unemployment rates (%)						
Belgium	8.5	7.0	8.1	7.5	7.7	10.8
Denmark	7.3	3.3	4.2	4.9	8.2	8.2
Germany	6.7	7.3	9.6	8.5	7.4	
Ireland	14.1	6.3	4.5	4.3	14.7	14.7
Spain	20.7	11.3	8.7	10.8	15.7	
France	9.8	7.8	9.0	8.8	9.9	8.5
Italy	8.6	6.7	6.9	8.8	9.3	7.7
Netherlands	4.4	3.1	4.4	3.6	5.3	8.2
Portugal	11.0	7.7	7.9	5.3	5.1	8.6
Sweden	8.1	6.2	6.9	6.3	5.8	3.5
UK	7.7	5.6	5.2	5.0	9.0	10.9
US	9.8	9.3	5.8	5.2	6.5	8.6

Source: Eurostat.

One response to rising youth unemployment has been to return, or prolong, full-time education (Rice, 1999). This implies that the 16-24 cohort are now better qualified than they were during the last recession. In the UK, 5.8 per cent of the 16-24 year olds were graduates in 1993, while in 2008 that share had risen to 13.2 per cent. The improvement in qualifications is more concentrated among females than males. By 2008, the proportion of females aged 18-24 with no qualifications had fallen to 4.6 per cent, but for males it was still over 7 per cent. In the UK, applications to attend university have increased sharply since 2008.[4] Employ-

[4] As of November 22, 2010 total applications were up 11.7 per cent compared to the same date in 2009.

ment subsidies have also helped young people find jobs as they lower their relative price.

Table 4. Employment rates (%) by educational status, ages 15-24 (ISCED, 1997)

	All (ISECD 0-6)		Pre-primary		Upper/post-secondary		Tertiary	
	2010 Q3	2008 Q1	2010 Q3	2008 Q1	2010 Q3	2008 Q1	2010 Q3	2008 Q1
Austria	55.8	54.6	42.0	38.9	69.4	70.8	58.0	73.9
Belgium	24.3	27.5	9.9	11.4	32.5	36.9	56.1	67.3
Bulgaria	23.1	24.9	5.2	5.4	40.4	46.6	59.6	65.1
Czech Rep.	24.4	27.2	3.4	4.1	43.0	48.3	33.4	44.1
Denmark	57.6	62.9	50.1	57.3	70.4	73.7	65.7	79.1
Estonia	23.5	35.5	8.4	16.8	34.2	55.1	57.2	75.3
Finland	43.0	39.3	26.9	20.1	63.5	59.5	87.4	79.9
France	30.8	31.3	13.9	16.3	41.7	42.1	54.1	51.6
Germany	45.2	47.5	32.1	34.8	63.4	65.7	71.7	83.8
Greece	20.7	22.8	12.3	16.5	26.2	25.0	47.4	59.3
Hungary	17.9	19.6	5.3	6.4	29.1	30.2	58.4	72.6
Ireland	30.8	47.0	9.3	19.6	43.9	62.0	62.8	80.5
Italy	20.5	24.2	12.3	15.0	30.9	36.1	29.3	30.7
Latvia	26.1	40.1	9.9	17.7	37.9	60.4	76.9	87.9
Lithuania	19.8	26.0	4.8	6.0	28.0	38.9	54.1	78.3
Luxemb.	19.4	21.9	11.0	14.5	33.9	30.5	41.1	54.2
Netherl.	66.0	68.0	56.8	59.2	75.0	77.3	79.6	81.5
Norway	52.3	56.9	47.9	49.4	64.1	70.2	75.1	81.2
Poland	26.3	26.6	6.6	6.5	41.8	42.3	52.8	66.9
Portugal	27.9	34.9	26.0	34.2	29.4	32.3	39.2	61.3
Romania	25.8	23.3	19.6	14.6	30.4	31.6	55.6	64.6
Slovakia	20.6	27.3	1.8	2.2	37.2	47.4	36.0	66.7
Slovenia	32.9	34.4	17.3	14.9	44.8	47.3	53.1	57.2
Spain	26.2	36.5	24.4	38.4	28.3	36.3	47.2	57.0
Sweden	43.7	39.0	26.6	22.4	63.7	64.6	68.1	53.1
UK	47.1	52.4	34.2	43.2	55.2	60.5	72.8	81.0

Notes: ISCED 0-2 = Pre-primary, primary and lower secondary education – levels 0-2. ISCED3-4 = Upper secondary and post-secondary non-tertiary education – levels 3-4 (ISCED 1997). ISCED levels 5-6 Tertiary education – levels 5-6 (ISCED 1997).

Table 4 presents employment rates for 15-24 year olds at the start of the recession in 2008Q1 and the latest data at the time of writing for 2010Q2. Employment rates for youngsters have fallen in most countries, but there are four exceptions where they have *increased* – Austria, Finland, Romania and Sweden. Unemployment rates for the least educated in the International Standard Classification of Education (ISCED) categories 0-2 jumped sharply in many countries with the biggest increases in Ireland, Latvia and especially Spain.[5] Interestingly, youth employment rates also increased for the most educated (ISCED 5-6) in a number of coun-

[5] http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm.

tries, notably Finland, France and Sweden. The unemployment problem of this age group is not solely the preserve of the uneducated.

Table 5. Estimated probability of unemployment

US

	1979	1982-83	2007	2010
15-24 years	.093	.126	.049	.076
25-34 years	.034	.057	.013	.024
35-44 years	.009	.023	.003	.006
55-64 years	-.005	-.010	.003	-.001
65+ years	-.005	-.039	.004	-.008

Europe

	1975-82	1983-89	2007	2010	2010
15-24 years	.096	.180	.131	.167	.170
25-34 years	.014	.045	.040	.037	.053
35-44 years	-.012	-.004	.009	-.004	.036
55-64 years	.029	.037	.041	.005	.020
65+ years	.028	-.002	-.042	-.060	.009

Sources: Mannheim Trend file and for 2010 No. 73.3 Eurobarometer and 2007.

Notes: Sample for 1975-89 is nine EU countries: Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, the Netherlands and the UK. The samples for 2007 are all twenty-seven EU countries. The final column is for the same nine countries as for 1975-89. Controls include gender, schooling and country or state. Estimated with dprobit.

In Table 5, we analyse how the probability of being unemployed has varied over time and by age group in the US and Europe. We use two micro-datasets: the Mannheim Trend file (supplemented with Eurobarometer data in 2010) and the Current Population Surveys in the United States. We apply the same set of controls – gender, schooling and country (state in the US) to each dataset. We report the coefficients on the various age dummies from a number of individual regressions. The coefficients in Table 5 indicate that the incidence of unemployment is increasingly falling on the young and, as in the 1980s, is currently greater in Europe than in the United States. In 2010, it is 17 percentage points higher among 15-24 year olds in Europe than among 45-54 year olds compared to just 7.6 percentage points in the US. Although this is a continuation of previous experience, it is worth noting that this recession is unusual in that the *overall* unemployment rate in the US has risen above the European rate for the first time in some decades. But youth unemployment problems continue to be more severe in Europe than in the US.

Table 6 provides a supply-side explanation of the rise in youth unemployment. The youth cohort is large at a time when the labour market is in

the doldrums. The table reports the relative size of the number of 5, 19, 15 and 25-year-olds as compared to the number of 20-year-olds which is set to 100. The decline in the youth cohort is especially marked in the Baltic countries. Progressively shrinking cohorts will have dramatic effects on the number of entrants to the labour market over the next fifteen years or so. The decline is relatively small in the US compared to other countries, in part because of its relatively high rate of immigration. Immigrants tend to be young. By 2020, the number of twenty-year-olds in the Euro area will have dropped by twelve per cent.

The recession has reversed recent reductions in youth unemployment in the developed world. Like other groups on the margins of the labour market, the young tend to experience particularly high rates of unemployment during recessions. The current experience fits this pattern. However, the youth cohort is diminishing in size in most countries, suggesting that, in the future, an excess supply of younger workers is less likely to occur.

Table 6. Cohort size in 2008 (age 20 = 100)

	5 years	10 years	15 years	25 years
Euro area	88	88	93	111
Denmark	105	112	114	98
Estonia	59	55	76	93
Finland	91	97	109	112
Germany	74	83	86	103
Greece	87	88	95	130
Ireland	104	98	95	137
Latvia	53	49	80	92
Lithuania	53	66	94	87
Netherlands	101	98	101	97
Norway	99	107	109	100
Spain	89	82	87	132
Sweden	86	82	111	95
UK	81	89	96	98
US	97	94	102	103

Source: Eurostat.

Table 7 uses the 2009 Eurobarometer studies No. 71.2 from May-June 2009 and No. 72.1 from August-September 2009 to analyse the individual characteristics associated with having *lost a job* during the recession, being able to *keep a job*, and self-assessed *ability to find a job*. Column 1 covers the whole sample, while columns 2 and 3 are restricted to those in employment.

Table 7. Probability of having lost, ability to keep and likelihood of finding a new job, and degree of optimism, Europe, 2009

	(1) Lost a job probit	(2) Ability to keep job ordered logit	(3) Likely to find a job OLS	(4) Optimistic ordered logit
Male	.0281 (9.82)	.0429 (1.28)	.4003 (8.32)	.1003 (4.16)
15-24*unempl.				.2859 (2.19)
15-24 years	.0583 (8.02)	-.1849 (2.39)	1.5383 (13.93)	.4662 (8.13)
25-34 years	.0519 (9.11)	-.2528 (4.26)	1.5242 (18.18)	.3190 (7.73)
35-44 years	.0432 (8.06)	-.2712 (4.74)	1.3761 (17.00)	.1625 (4.11)
55-64 years	.0422 (8.10)	-.2187 (3.83)	.6696 (8.32)	.0498 (1.14)
65+ years	-.0854 (17.83)	-.0534 (0.35)	-.5358 (2.50)	.1278 (2.45)
ALS 16-19	-.0045 (1.08)	.2430 (4.11)	.4980 (5.77)	.2249 (6.44)
ALS 20+	-.0330 (7.62)	.7075 (11.37)	1.2023 (13.39)	.5253 (13.51)
Still studying	-.0682 (14.23)			.6080 (8.40)
No FT education	-.0028 (0.19)	.1959 (0.64)	-.1431 (0.33)	-.2084 (1.42)
Home worker				-.0954 (1.95)
Unemployed				-.4865 (9.64)
Retired/disabled				-.2264 (5.16)
Immigrant	.0756 (10.26)	-.2730 (3.42)	-.1719 (1.49)	
Health problems	.0158 (3.67)	-.2885 (4.56)	-.6191 (7.04)	
cut1/constant	-3.5596	4.0107		-1.8505
cut2	-1.9104			-.0170
cut3	.1649			2.2223
N	29 484	13 462	13 129	26,164
Pseudo/ Adjustment R^2	.1124	.0798	.1354	.0590

Sources: Columns 1-3: Eurobarometer No. 71.2, May-June 2000. Column 4: Eurobarometer No. 72.1, August-September 2009.

Notes: Excluded categories: Age left school<16 and ages 45-54. The "health problems" variable relates to whether the individual suffers from a chronic physical or mental health problem, which affects her daily activities. In column 1 the dependent variable is set to one if the respondent says that "as a result of the economic crisis she has lost her job", zero otherwise and includes the full sample including those studying. In column 2, the dependent variable is "How confident would you say you are in your ability to keep your job in the coming months? Are you not at all confident; not very confident; fairly confident or very confident?" The equation is estimated as an ordered logit. In column 3 the question is "if you were to be laid off, how would you rate on a scale of 1 to 10, the likelihood of you finding a job in the next six months?" "1" means that it "would be not at all likely" and "10" means that it "would be very likely". T-statistics in parentheses. In column 4 the question is "please tell me whether you totally disagree (8.7 per cent), tend to disagree (28.5 per cent), tend to agree (44.0 per cent) or totally agree (17.4 per cent) with the following statement: You are optimistic about the future?" All equations also include 29 country dummies.

Males are more likely to have lost a job but they also have a greater confidence than females of being able to find a new job. Those aged 45-54 are significantly less likely to have lost their job than other age groups except those aged 65+. Those aged 15-24 are most likely to have lost their jobs. They are confident in their ability to find a job, perhaps because they have greater flexibility both spatially and occupationally.

Immigrants are significantly more likely to have lost their job and are less likely to believe that they can hold on to their jobs. Those with health problems have a similar set of beliefs. Among these countries, the results for Spain and Ireland are particularly negative: respondents from these

two countries are more likely to have lost a job, feel less secure in their ability to retain their job and also have little confidence in being able to find a job.

1.3 Attitudes to unemployment

Column 4 of Table 7 makes use of data from Eurobarometer No. 72.1 from August and September 2009 to estimate an ordered logit where respondents are asked how optimistic they are about the future. Youngsters are especially optimistic, and based on the youth-unemployment interaction term, the young unemployed are more optimistic than the adult unemployed, but still less so than students or the employed. The question is whether they are right to be optimistic given that they came of age in a recession?

In Table 8, we make use of a very recent Eurobarometer, conducted in May 2010, which contains information on attitudes to jobs. We test to see whether the young unemployed are different from the adult unemployed, by including an age < 25-unemployed interaction term. It is statistically insignificant in all cases.

In column 1 the theme of youngsters being especially optimistic is developed further. Here, the respondents are asked for their expectations for employment in their country and whether they think it will be worse, the same or better over the next year. Once again, the young are more optimistic than all older age categories. Men, the Swedes and the more educated are optimistic and the unemployed and the Greeks more pessimistic.

Column 2 examines whether respondents feel that, after the financial crisis is over, the deficit should be increased to create jobs. The young are supportive as, unsurprisingly are the unemployed themselves, along with the Irish. The most educated are opposed.

Respondents are asked to report the two most important issues they believe their country is facing from a list of ten. By far and away the most important of these is unemployment, which was stated by over half of the respondents, followed by 43 per cent who mentioned 'the economic situation in our country'.[6] Column 3 has the dependent variable set to one if

[6] The full set of responses with proportions mentioning the issue in parentheses: unemployment (51 per cent); economic situation (43 per cent); rising prices/inflation (19 per cent); crime (18 per cent); health care system (16 per cent); pensions (10 per cent); taxation (8 per cent); immigration (7 per cent); educational system (6 per cent); terrorism (4 per cent);

the respondent reported that unemployment was one of her two main issues and zero otherwise. The coefficients are estimates of the relevant probabilities. The young are more likely than other age groups to say that unemployment is the main problem as, unsurprisingly, are the unemployed. The main countries where unemployment is high such as Ireland and Spain, along with residents of a number of East European countries, including Latvia and Lithuania, say that this is a concern.

Table 8. Attitudes and expectations, 2010

	(1) Employment expectations Ordered logit	(2) Necessary to create jobs Ordered logit	(3) Unemploy-ment main issue Probit	(4) Life satisfaction Ordered logit
Male	.0816 (3.46)	-.0439 (1.81)	-.0199 (3.19)	-.1083 (4.56)
15-24*unemployed	.0692 (0.61)	.1364 (1.12)	.0139 (0.45)	.1725 (1.51)
15-24 years	.3658 (5.77)	.2017 (3.03)	.0493 (2.93)	.7983 (12.24)
25-34 years	.3094 (7.56)	.0484 (1.15)	.0152 (1.40)	.3761 (9.11)
35-44 years	.1685 (4.43)	-.0562 (1.44)	.0053 (0.53)	.1645 (4.31)
55-64 years	-.0038 (0.09)	.0214 (0.51)	-.0141 (1.30)	.1288 (3.12)
65+ years	.0445 (0.88)	.0532 (1.01)	-.0508 (3.82)	.4234 (8.31)
Home worker	-.0748 (1.54)	-.0133 (0.26)	.0288 (2.27)	-.2595 (5.35)
Unemployed	-.1191 (2.73)	.1577 (3.40)	.1421 (12.35)	-1.0957 (25.10)
Retired/disabled	-.0123 (0.30)	-.0407 (0.94)	-.0054 (0.50)	-.2314 (5.54)
ALS 16-19	.0401 (1.17)	-.0343 (0.95)	-.0151 (1.70)	.3066 (9.06)
ALS 20+	.2142 (5.67)	-.1555 (3.94)	-.0346 (3.48)	.7817 (20.55)
Still studying	.2634 (3.80)	-.1279 (1.77)	-.0282 (1.54)	.8798 (12.35)
No FT education	-.0025 (0.02)	.0024 (0.02)	-.0123 (0.37)	-.5343 (4.11)
Living together	.0640 (1.53)	-.0489 (1.13)	.0032 (0.29)	-.2068 (4.83)
Single	.0152 (0.42)	-.0532 (1.42)	-.0083 (0.87)	-.4421 (12.05)
Divorced/separated	-.0770 (1.69)	-.1234 (2.60)	.0060 (0.50)	-.6695 (14.67)
Widowed	.0466 (1.04)	.0284 (0.59)	-.0265 (2.27)	-.5337 (11.93)
Other EU state	.3255 (4.67)	.1307 (1.89)	-.0219 (1.20)	-.1095 (1.61)
Europe non-EU	.0724 (0.77)	.6146 (6.06)	.0434 (1.76)	-.2596 (2.83)
Asia/Africa/Latin	.0693 (0.68)	.2933 (2.76)	.0158 (0.58)	-.3784 (3.66)
America/Japan	.3858 (1.22)	.2610 (0.79)	-.0780 (0.89)	.4890 (1.41)
Austria	.6499 (7.67)	.5683 (6.66)	-.0679 (2.98)	-.1571 (1.77)
Bulgaria	.3983 (4.57)	.6092 (6.13)	.0808 (3.61)	-2.5190 (28.63)
Croatia	-.2970 (3.40)	.8936 (10.10)	.1716 (7.78)	-.8078 (8.85)
Cyprus	-.6810 (6.04)	.5175 (4.69)	-.0466 (1.68)	-.2290 (2.08)
Czech Rep.	.0444 (0.52)	.5587 (6.56)	.0311 (1.38)	-.8571 (9.71)
Denmark	1.4015 (16.33)	.8335 (9.85)	-.0557 (2.44)	1.6625 (17.53)
East Germany	-.1181 (1.12)	-.0352 (0.33)	-.0087 (0.31)	-.8928 (8.24)
Estonia	1.2726 (14.88)	.2446 (2.75)	.2445 (11.38)	-1.1404 (12.98)
Finland	.8308 (9.83)	.8371 (9.98)	.0833 (3.74)	.3291 (3.72)
France	.1171 (1.38)	-.1218 (1.42)	.1404 (6.41)	-.4543 (5.13)
Greece	-1.2808 (13.37)	-.2708 (3.16)	-.0111 (0.49)	-2.3419 (26.54)
Hungary	.8139 (9.63)	.2399 (2.80)	.1502 (6.82)	-1.8973 (21.70)

housing (3 per cent); the environment (3 per cent); energy (3 per cent) and defence/foreign affairs (1 per cent).

Table 8. continued….

	(1 Employment expectations Ordered logit	(2) Necessary to create jobs Ordered logit	(3) Unemploy-ment main issue Probit	(4) Life satisfaction Ordered logit
Iceland	1.0515 (10.19)	.8136 (8.19)	.0853 (3.17)	1.0579 (9.62)
Ireland	.0402 (0.47)	1.0639 (11.97)	.1870 (8.54)	.4466 (4.97)
Italy	.1316 (1.54)	.1629 (1.84)	.0503 (2.25)	-1.1695 (13.30)
Latvia	.6578 (7.89)	-.2165 (2.49)	.1953 (8.92)	-1.5730 (17.94)
Lithuania	.0006 (0.01)	.9632 (11.05)	.1422 (6.46)	-1.8912 (21.48)
Luxembourg	-.3927 (3.62)	.6086 (5.82)	-.0041 (0.15)	.5996 (5.50)
Macedonia	.0895 (1.05)	1.7473 (19.10)	.1491 (6.74)	-1.4650 (16.23)
Malta	.8118 (7.34)	.2218 (1.97)	-.3147 (10.97)	-.4782 (4.22)
Netherlands	.6657 (7.80)	-.1490 (1.80)	-.2631 (11.62)	.7077 (7.98)
Poland	.5324 (6.30)	.7238 (8.23)	.0552 (2.45)	-.7725 (8.66)
Portugal	-.4724 (5.27)	.3512 (3.95)	.1618 (7.26)	-2.0441 (23.35)
Romania	-.8601 (9.42)	1.0423 (11.45)	-.0617 (2.73)	-2.8260 (32.07)
Slovakia	.2379 (2.78)	1.1254 (13.15)	.1889 (8.67)	-.8867 (9.99)
Slovenia	-.0969 (1.13)	-.0445 (0.53)	.0713 (3.20)	-.3659 (4.14)
Spain	.3549 (4.07)	.3472 (3.82)	.2510 (11.58)	-.4443 (4.96)
Sweden	2.0228 (23.05)	.9473 (11.35)	.1523 (7.00)	.8669 (9.82)
Turkish Cyprus		.5669 (4.89)		-1.1993 (10.63)
Turkey	.1997 (2.21)	.1934 (1.99)	.2080 (9.16)	-.9630 (9.93)
UK	.6303 (7.79)	.7395 (9.23)	-.1200 (5.62)	.7489 (8.93)
West Germany	.3498 (4.16)	-.2990 (3.53)	-.0465 (2.06)	-.1130 (1.28)
/cut1	.1006	-1.6815		-3.4753
/cut2	1.8205	-.0159		-1.7428
/cut3		2.1023		1.2795
N	28 872	25 418	30 215	30 580
Pseudo/Adjusted R^2	.0599	.0286	.0625	.1505

Source: Eurobarometer No. 73.4, May 2010.

Notes: Excluded categories: Age left school<16 and ages 45-54, Belgium, EU national and married. T-statistics in parentheses. Question 1: What are your expectations for the next twelve months: will the next twelve months be better (= 3), worse (= 2) or the same (= 1), when it comes to the employment situation in (our country). Question 2: In an international financial and economic crisis, it is necessary to increase public deficits to create jobs. Totally agree (= 4); Tend to agree (= 3); Tend to disagree (= 2); Totally disagree (= 1). Question 3: What do you think are the two most important issues facing (our country) at the moment – unemployment? Question 4: On the whole, are you very satisfied (= 4), fairly satisfied (= 3), not very satisfied (= 2) or not at all satisfied (= 1) with the life you lead?

Finally, in column 4, we report a life satisfaction equation. Happiness measures are of interest in themselves but also more broadly it appears that such scores are correlated with positive health outcomes (Blanchflower, 2009). Happiness, for example, is associated with improved heart rate and blood-pressure measures of response to stress and a lower risk of coronary heart disease. Happy people even heal faster (Ebrecht et al., 2004). Consistent with the findings in the happiness literature, most people report themselves to be happy. We include a set of controls that are relatively standard in the literature including labour force status, gender, region, schooling and marital status, plus controls for smoking and exercise. It is well known in the literature that the unemployed are unhappy

and that is true here; we also observe that happiness is U-shaped in age with the young being happiest. Happiness is high in the Nordic countries, notably in Denmark, Iceland and Sweden.

2. Identifying the effects of past unemployment

Attempts to identify the scarring effects of unemployment have a long history. Heckman and Borjas (1980), Ellwood (1984) and Corcoran (1984) made early contributions, with the former two papers exploring the econometric issues associated with identifying scarring, which is a form of state dependence. There are two main issues. First, individuals may differ in those fixed characteristics that influence their likelihood of experiencing unemployment. In contrast, state dependence implies changes in actual or perceived worker characteristics due to previous unemployment history. Thus, correlations between current and past unemployment may incorrectly be viewed as causal rather than the result of individual heterogeneity. Second, omitted exogenous variables that are serially correlated may induce spurious state dependence effects.

Heckman and Borjas (1980) argue that there are three main forms of state dependence: They base their argument on a discrete-state continuous-time Markov process with an "employment" process and an "unemployment" process which respectively determine the probability of transition between these states. These probabilities are time invariant. Then, it follows that the distribution of time in either state follows an exponential distribution which is independent of the time in the current state (Cox and Miller, 1965). Thus, the length of time in the current spell of unemployment does not affect the rate of transition out of this state and hence, there is no state dependence. By changing the structure of this model, they formalize their three models of state dependence.

In the first type, the event of unemployment alters the probability of being in the unemployed state. This is known as *occurrence dependence* and means that the chance of being unemployed at present increases with the number of previous unemployment spells. The second type, *duration dependence*, posits that the probability of remaining unemployed depends on the length of the *current* unemployment spell and therefore requires relaxation of the time-invariance aspect of the Markov process. The third

type is a natural extension of the second, and is known as *lagged duration dependence* and posits that the probability of unemployment depends on the lengths of previous spells of unemployment and not just the current spell. Heckman and Borjas further note that the probabilities of unemployment may vary both with time and, crucially for our application, age.

The issue of finding a consistent estimate for the lagged duration dependence form of state dependence is analogous to the problem of finding a consistent estimator for a model with a lagged dependent variable and serially correlated errors. Estimators for the other forms are more complex. Consistency for the lagged duration dependence case can be achieved through the use of an appropriate instrument. Gregg (2001) investigated lagged duration dependence using the UK National Child Development Survey (NCDS). Seeking to explain whether individuals were unemployed at the ages of 28 and 33, he used local area unemployment at the age of 16 as an instrument for unemployment experience up to the age of 23. His argument for this instrument was that the local labour market in which individuals find themselves at the age of 16 is largely exogenous. Variations in conditions in these markets will explain some of the variation in early labour market experience strengthening its case as a valid instrument. However, he acknowledges that the local labour market will not be independent of parental characteristics, which may also influence children's subsequent labour market experience. This weakens the validity of the instrument. In general, it is difficult to find a truly exogenous instrument within the labour market. Interdependence is characteristic of the labour market, particularly if one takes account of serial correlation. Nevertheless, Gregg argues that his instrument "does at least take the unobserved heterogeneity back a generation". His results suggest that the number of months of unemployment between the ages of 28 and 33 increases by two months for every three months spent unemployed before the age of 23.

Gregg and Tominey (2005) also use data from the NCDS and apply the same identification strategy as Gregg (2001) and find that there is a significant *wage* penalty of youth unemployment on males even after controlling for education, region, wealth of family and personal characteristics. Their results suggest a scar from youth unemployment of 13-21 per cent at the age of 41 although this penalty was lower at 9-11 per cent if individuals avoid repeat exposure.

Taking a different approach, Beaudry and DiNardo (1991) use a cohort-based argument to identify state dependence. They argue that the distribution of heterogeneity is constant across cohorts, but that cohorts have differential experience of unemployment because they enter the labour market at different stages of the economic cycle. They argue that current wages may be affected by past labour market experience since, in a world of long-term contracts, workers' current wage will reflect the reservation wage of workers at the time they entered the labour market which, in turn, depends on unemployment rates at that time.

Similar evidence that even youngsters who choose to go to college or university are hurt if they enter the labour market during a recession is provided by Kahn (2010). She shows that the labour market consequences of graduating from college in a bad economy have large, negative and *persistent* effects on wages. Lifetime earnings are substantially lower than they would have been if the graduate had entered the labour market in good times. Furthermore, cohorts who graduate in worse national economies tend to end up in lower-level occupations.

Research by Giuliano and Spilimbergo (2009) suggests that the period of early adulthood (between 18 and 25) seems to be the age range during which people are more sensitive to macroeconomic conditions. They find that being exposed to a recession before the age of 17 or after the age of 25 has no impact on beliefs about life chances. However, youngsters growing up during recessions tend to believe that success in life depends more on luck than on effort; they support more government redistribution, but have less confidence in public institutions. Recessions seem to adversely affect youngsters' beliefs.

Nordström Skans (2004) uses sibling fixed-effects to identify the effect of previous unemployment on current labour market outcomes. In a search theory of the labour market, individual outcomes may be affected by entirely random events. State dependence is indicated if the effects of these events persist. The use of siblings is aimed at controlling for other influences on labour market outcomes. Differences between siblings that are correlated with early unemployment and subsequent labour market outcomes are controlled for using observed *individual* characteristics.

Nordström Skans compares the siblings model with OLS estimates where unobserved individual components are proxied by observable *family* characteristics instead of the sibling fixed effect. This model requires

strong identification assumptions to infer causation. All differences between individuals that are correlated with both initial unemployment and later labour market performance must be captured either by observed individual or family controls.

The siblings fixed-effects model shows a significant negative effect on earnings for up to five years following initial unemployment. These effects decline over time and are consistent with a theoretical model where employers' recruitment decisions are more influenced by recent unemployment spells. The individual-based model gives somewhat larger state dependence effects which potentially, but not necessarily, suggest that OLS estimates are upward biased.

In previous work (Bell and Blanchflower, 2010) we examine the relationship between current unemployment and previous unemployment spells. We first focus on the negative effects of lagged unemployment durations on subsequent wages, building on the literature that not only includes Gregg and Tominey, but also Mroz and Savage (2006), Nickell et al. (2002) and Stewart (2000). The underlying argument is that prolonged spells of unemployment reduce human capital and act as a negative signal to employers, both of which are likely to adversely affect the future evolution of wages. The novelty of our approach is the use of the most recent data from a birth cohort study, the NCDS whose members were aged 50 at the time of the most recent sweep.

3. Data and empirical analysis

Consider an equation of the form:

$$\gamma_{it} = \beta x_{it} + \phi z_{it} + f\left(U_{i0},..,U_{i\tau}\right) + \lambda_i + u_{it}\,, \tag{1}$$

where γ_{it} is some labour market outcome for individual *i* at time *t*, x_{it} is a vector of personal characteristics, z_{it} is a set of labour market characteristics, $U_0 \ldots U_\tau$ are characteristics of previous unemployment spells observed in τ previous time intervals, λ_i is a measure of heterogeneity for each individual and u_{it} is the disturbance. This equation is sufficiently general to capture occurrence dependence, duration dependence and lagged duration dependence. From these possibilities, we focus on the

lagged duration dependence due to the relative simplicity of the estimator. Thus, our estimation equation is equation (2), which is a linear version of (1), where the length of unemployment spells, L^{U_t}, is used to capture state dependence:

$$\gamma_{it} = \beta x_{it} + \phi z_{it} + \mu_0 L_i^{U_0} + .. + u_\tau L_i^{U_\tau} + u_{it}. \quad (2)$$

Our data comprise a cohort study where data have been collected at irregular intervals. Past unemployment spells have been observed when members of the sample are of the same age. Hence, the coefficients are both time and age specific. If the effects of unemployment on outcomes decline over time, one would expect $\mu_0 >> \mu_\tau$. On the other hand, if early spells of unemployment have scarring effects, this expectation would be reversed, i.e. $\mu_0 << \mu_\tau$. Further, if lagged unemployment is driven by fixed individual heterogeneity, then one would not expect to see large changes in the μ coefficients if local labour market conditions are controlled for.

If unobserved heterogeneity affects individuals' lifetime propensity to become unemployed, then one might expect a positive correlation between the λ_i and $L_i^{U_j}$, which would cause an upward bias in the coefficients on the $L_i^{U_j}$. One way of reducing this effect is to increase the number of individual controls. Another is to instrument unemployment spells. But it is also worth noting that the effects of past unemployment are likely to vary with the cycle.

We can now add to the literature on scarring by exploring some new evidence using a specification similar to (2). Following Gregg and Tominey, we use the 1958 birth cohort in the National Child Development Study (NCDS). The NCDS has followed a cohort of people who were born in one week – March 3-9 1958. There have been eight attempts to trace all members of this birth cohort to monitor their physical, educational and social development. The first three sweeps were carried out by the National Children's Bureau, in 1965, when the respondents were aged 7, in 1969 (NCDS1) aged 11 (NCDS2) and in 1974 aged 16 (NCDS3). The fourth sweep, NCDS4, was conducted in 1981, when the respondents were aged 23. The fifth sweep was carried out in 1991, when the respondents were aged 33 (NCDS5). For the sixth wave, conducted in 1999-2000, when the respondents were aged 41-42 (NCDS6), fieldwork

was combined with the 1999-2000 wave of the 1970 Birth Cohort Study (BCS70). The seventh sweep of NCDS was conducted in 2004-05, when the respondents were aged 46-47 (NCDS7). The eighth and most recent sweep was conducted in 2008-09 when the respondents were aged 50.

In 1981, at the age of 23, there were 12 537 responses to the question of whether the respondent had ever been unemployed since the age of 16. Unemployment rates in the UK had risen from 5.4 per cent in 1979 to 6.8 per cent in 1980 and 9.6 per cent in 1981, when the UK had moved into recession. Unemployment would eventually peak at 11.4 per cent in the spring of 1984. In the sample, 44 per cent reported that at some point in their working lives, they had been unemployed. The question is whether unemployment when young has an impact on outcomes later in life and whether the effect of an unemployment spell when young is greater than when older. It turns out that it is.

3.1 Effects on wages

Using the most recent data from the 2008-09 sweep, we estimate a wage equation. Our sample is therefore limited to 6 811 employees. To capture individual and labour market characteristics, we include controls for full-time/part-time status, permanent/temporary job, region (10), school dummies (8), industry dummies (59) and workplace size (4). To test for scarring, we include the number of months unemployed before the age of 23 as a regressor and also whether the individual was unemployed at the age of 46. This means that we exclude from our sample nearly a thousand employees who report their wages but who either did not respond to the fourth sweep of the survey (NCDS4) or did not report the number of months unemployed.

Table 9 illustrates the difficulties in distinguishing scarring effects from individual heterogeneity. The information on IQ and math scores at the age of 11, and the reading score at 16, suggests that these would be reasonably good predictors of months unemployed before the age of 23. Yet, whether the cause is scarring or heterogeneity, adverse outcomes occur, and may indicate the need for policy intervention due to lost output as well as other social and economic costs.

Our regression results are reported in Table 10. The dependent variable is the log of weekly wages at the age of 50. We have around 6 000

observations for our simplest regression. The sample size declines as we introduce additional controls. We focus on the coefficients on early unemployment and unemployment in 2004, which is effectively, lagged unemployment, since 2004 was the time of the previous observation. As additional controls are added, the size of the coefficients on the unemployment variable decline as would be expected in the presence of heterogeneity.

Table 9. Characteristics of individuals in the NCDS according to number of months unemployed between ages 16 and 23

	0	>0<3	≥3< 6	≥6<12	≥12<24	≥24
Social class (1958) – I	5	5	4	4	3	2
Social class (1958) – II	14	13	15	12	9	3
Social class (1958) – III – non-manual	11	10	9	8	9	6
Social class (1958) – III – manual	51	49	50	52	50	50
Social class (1958) – IV	11	15	11	13	15	16
Social class (1958) – V	7	9	10	11	15	23
IQ score at 11	45.3	45.0	43.1	42.5	38.0	32.7
Math score at 11	18.0	17.9	16.3	16.2	13.6	10.5
Reading score at 16	26.3	26.4	25.7	25.0	22.9	19.9
Math score at 16	13.6	13.5	12.6	12.1	10.2	8.7
Malaise score at 23	2.48	2.67	2.94	3.27	3.65	4.21
Malaise score at 50	1.36	1.43	1.52	1.86	1.96	2.22
Unemployed at age 33 (%)	1.1	0.6	1.1	3.0	2.5	9.5
Unemployed at age 42 (%)	1.1	1.5	1.8	4.1	4.5	8.9
Unemployed at age 50 (%)	1.6	1.7	3.3	4.1	4.4	10.0
Very difficult financially at 50 (%)	1.6	3.3	1.9	5.4	6.6	5.0
Happy at 50	3.54	3.51	3.46	3.4	3.27	3.19
Life satisfaction at 50	7.45	7.28	7.09	7.1	6.92	6.63
Gross weekly pay at 50	£592	£578	£501	£479	£428	£373
No academic qualification at 50 (%)	15.1	15.9	16.4	21.4	30.8	51.0

Notes: 'Very difficult financially' refers to an individual's assessment of her personal situation. Social class refers to mother's husband in the Perinatal Mortality Study in 1958.

Following our earlier argument regarding the difficulty of finding appropriate instruments within the labour market, we use OLS, noting that in the Gregg and Tominey study, which employs the same dataset estimated over an earlier period, the IV results "are not largely different from the OLS estimates" (p 505). In any case, it is extremely hard to find any convincing instruments that are not related to the respondent's earnings, especially including the local unemployment rate (Blanchflower and Oswald, 1994).

The addition of controls reduces the coefficient on months unemployed when aged less than 23 from –0.01382 to –.0092. Nevertheless, the effect on current wages of cumulative unemployment experience when aged less than 23 is highly significant. The same cannot be said for unemployment in 2004, which is not significant even at the 10 per cent

level. Males are consistently and significantly more likely to be unemployed than females.

Our results update Gregg and Tominey (2005) using the same data. But our focus is on outcomes in the most recent sweep of the NCDS data at the age of 50. We also find evidence of scarring. Our evidence supports the general notion that unemployment experience in early adulthood can have a continuing negative effect on labour market outcomes even up to three decades later. Conditional on early labour market experience, later spells of unemployment do not have a negative impact on wages.

Table 10. Log weekly wages in 2008/09 at the age of 50 (employees only)

	(1)	(2)	(3)
Months unemployed ≤23	-.0138 (10.00)	-.0092 (8.10)	-.0090 (7.15)
Male	.6813 (35.73)	.3263 (17.15)	.3183 (15.63)
Unemployed in 2004		-.1249 (1.50)	
Part-time dummy	No	Yes	Yes
Permanent job dummy	No	Yes	Yes
Region dummies (10)	No	Yes	Yes
School dummies (8)	No	Yes	Yes
Industry dummies (59)	No	Yes	Yes
Workplace size dummies (4)	No	Yes	Yes
Constant	5.7595	5.3279	5.2758
Adjusted R^2	.1878	.5017	.4923
Observations	5 879	5 878	5 309

Source: National Child Development Study, 1958 birth cohort.

3.2 Effects on happiness

In Table 11 we examine a different outcome, again in the context of equation 1: self-reported happiness at the age of 50. The sample is larger because we now include all individuals and do not restrict the sample to employees as in Table 9. The exact question asked is: on balance I look back on life with a sense of happiness (n = 9845). Never = 1 per cent; not often = 7 per cent; sometimes = 34 per cent and often = 58 per cent.

Again consistent with the findings in the happiness literature, most people report themselves to be happy. We include a set of controls that are relatively standard in the literature including labour force status, gender, region, schooling and marital status, plus controls for smoking and exercise. In column 1, we include months unemployed up to the age of 23 in an OLS regression and this enters significantly negatively. In column

3, we also include lagged unemployment variables, from NCDS7 and NCDS6 at ages 42 and 47. Interestingly, with this variant of equation 1, both are insignificant and the significance of the months unemployed early in life variable remains. The two more recent lagged unemployment variables are insignificant in columns 3 and 4. So spells of unemployment while young reduce happiness at the age of fifty, even though unemployment in the mid forties does not. And the extent of the decline in happiness increases with the number of months unemployed at this early age.

Table 11. Happiness in 2008/09 at the age of 50

	(1)	(2)
Months unemployed ≤23	-.0051 (5.38)	-.0048 (4.38)
Unemployed in 2004		-.0856 (1.21)
Unemployed in 2000		-.0659 (1.03)
Part-time employee	-.0052 (0.24)	-.0008 (0.04)
Full-time self-employed	.0243 (1.02)	.0147 (0.57)
Part-time self-employed	-.0523 (1.14)	-.0965 (1.96)
Unemployed	-.1876 (3.90)	-.0454 (0.77)
Full-time education	-.1900 (1.28)	-.2397 (1.59)
Government scheme	-.5055 (1.11)	-.7448 (1.17)
Temporarily sick/disabled	-.0828 (0.85)	-.0352 (0.34)
Permanently sick/disabled	-.3755 (10.16)	-.3842 (9.09)
Looking after home/family	-.1183 (3.57)	-.1040 (2.93)
Wholly retired	-.1144 (1.37)	-.1516 (1.62)
Other labour force status	.0075 (0.11)	.0010 (0.02)
Male	-.0741 (4.61)	-.0629 (4.02)
Takes daily exercise	.0482 (2.83)	.0445 (2.43)
Smoker	-.0991 (5.17)	-.1024 (4.94)
Constant	3.2761	3.2970
Adjusted R^2	.0798	.0727
Observations	8 4267 234	6 679

Source: National Child Development Study, 1958 birth cohort.

Notes: All equations include ten region dummies, five marital status dummies and eight schooling dummies. Excluded category: full-time employees. T-statistics in parentheses. Question. 'On balance I look back on life with a sense of happiness (N = 9 845)'. Never = 1 per cent; not often = 7 per cent; sometimes = 34 per cent and often = 58 per cent.

Thus, we have presented stark findings, consistent with much earlier evidence that youth unemployment reduces wages and happiness more than thirty-five years later. And the more months of unemployment when young, the bigger the effects. Our empirical strategy could potentially provide biased estimates. The extent to which it does so depends on the extent to which the experience of unemployment while young is simply driven by fixed effects: some people may simply have a propensity for unemployment and the fact that there is something fundamentally differ-

ent about them, rather than a result of their early labour market experiences, is why they are unemployed in later life.

We cannot fully address this issue with the data at hand. But given that youth unemployment is correlated with a number of negative outcomes, our view is that it would be dangerous to conclude that youth unemployment is simply driven by genetics. Even if the scarring we have observed was driven by the unobserved fixed effects, it is unclear why this would matter for policy. Policy should focus on reducing the harmful effects of youth unemployment notwithstanding if individuals were scarred by earlier spells of unemployment or by some permanent disposition to being unemployed. It is quite clear that the most harmful effects appear to be on the least skilled and least educated. If there had been earlier interventions to help such individuals, they would not be in a similar situation in their middle age. As the OECD (2010) noted recently, "with the economic recovery still fragile and fiscal pressures mounting, there are concerns that many will be left behind and could face years of unemployment". The consequences of inaction may well be large.

4. Conclusions

In this paper, we have documented the increase in youth unemployment since the start of the Great Recession. While youth unemployment rates have increased in almost all countries, there has been a wide divergence in the size of this increase. There is evidence that the least educated have been hit the hardest. Particularly large increases have occurred in countries that have suffered house price declines crises such as Spain, Latvia, Lithuania and Ireland. In contrast, youth unemployment has remained relatively low in Austria, Denmark, Germany and the Netherlands.

The concern is that such spells of unemployment while young have long-lasting effects, which would be bad for the individuals and for the countries themselves, potentially raising the natural rate of unemployment in the long run. Our micro-econometric analysis confirms that broadly the same specification provides a consistent explanation of higher rates of youth unemployment in Europe, the US and the UK. We also find that these specifications are consistent through time in the UK and the US,

though it appears that the relative disadvantage of youth in the labour market has increased during the Great Recession.

Our analysis of the UK NCDS data supports the notion that early adulthood unemployment creates long lasting scars which affect labour market outcomes much later in life. We focus on weekly wages and happiness. Our results showed significant effects at the age of 50 from early adulthood unemployment but none from recent unemployment experience.

Given these negative effects of early unemployment experience, the immediate policy response might therefore be to increase the demand for labour in general, or to seek to change the balance of demand in favour of younger workers. The most readily available lever for either of these approaches is fiscal policy. But this should not be taken as suggesting that efforts to improve the education, skills and employability of the young should not also be a focus of policy intervention. This age group was not responsible for the recession. It should not be expected to pay for it through potentially long-run adverse labour market outcomes.

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Comment on Bell and Blanchflower: Youth unemployment in Europe and the United States

Oskar Nordström Skans[*]

The paper by Bell and Blanchflower discusses questions of fundamental importance for both economists and policy makers: What are the causes and consequences of, and remedies for, youth unemployment during an economic downturn? It is noted that youth unemployment in the EU rose by a factor of 1.5 during the Great Recession, but that there is massive variation in the numbers. Germany, where the youth unemployment rates actually declined, serves as an extreme positive example.

The paper is compactly written and covers a massive number of aspects either related to the youth labor market or to the Great Recession in general. In this comment, I will focus on the intersection of these two topics: the youth labor market during the recession. I briefly discuss four issues raised in the paper: First, are youths hit harder by the recession than older workers? Second, which type of policies may mitigate the impact of recessions on youths? Third, is the long-run impact of recessions harder for youths than for older workers? Fourth, are youths who are unemployed in a recession right to be more optimistic about their labor market prospects than older unemployed workers?

To provide some evidence on the first two questions, it is useful to isolate the impact of the recession on youths by removing factors which caused some countries to be hit harder by the recession (overall) than others as well as permanent differences in youth unemployment rates

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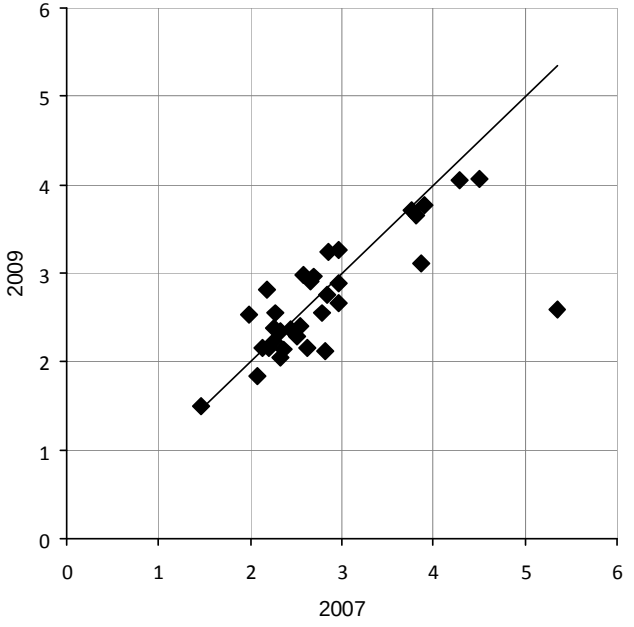
among countries. A simple way of isolating the impact of the recession on youths along these lines is to focus on the change in the relative unemployment rates of youths (defined as the ratio of the youth unemployment rate to the prime-aged unemployment rate) between 2007 (before the crisis) and 2009 (during the crisis).

Figure 1 shows a scatter plot of the relative youth unemployment rate before and during the crisis in all OECD countries. Countries on the solid 45-degree line have an unchanged relative youth unemployment rate whereas countries above (below) have experienced an increased (decreased) relative youth unemployment rate. As can be seen in the graph, all countries except one (Iceland) are clustered along the 45-degree line, making the line look much like a regression line. The figure conveys two important lessons: First, the crisis has not resulted in a systematic increase in the relative youth unemployment rate.[1] Second, the countries that experience high relative youth unemployment rates *during* the crisis are first and foremost characterized by high relative youth unemployment rates *before* the crisis. This implies that the crisis did, in fact, not hit youths harder than other groups (in relative terms) and this seems to be approximately true in all countries. My interpretation of this simple graph is that it also gives some directions regarding the appropriate policy tools if we want to shelter youths from the negative impact of recessions: We should make sure that the institutions are well equipped to facilitate efficient school-to-work transitions *irrespective of the cycle*. The (short-run) impact of institutions appears largely acyclical according to this metric.

Another interpretation of the fact that the recession hit youths and adults equally hard is that it is best to avoid bad times altogether, or if times turn bad ensure that they become better as fast as possible. This seems to be the route emphasized by Bell and Blanchflower who, among other things, propose more expansionary fiscal policies in the interest of youths. This is, of course, a policy suggestion with many unknowns, none of which is discussed in the paper. But since youths and adults are hit equally hard by the recession (at least in relative terms), my interpretation is that youth unemployment *per se* cannot motivate such policies.

[1] For the entire OECD there was actually a decline from 2.43 to 2.27 during the period.

Figure 1. Relative youth unemployment in 2007 and 2009 among 33 OECD countries.



Source: OECD.

Note: Relative youth unemployment is calculated as the ratio of unemployment among 15-24 year olds to the unemployment rate among 25-54 year olds.

An argument to the contrary is that youths suffer more severe long-term consequences from recessions than adults. To analyze this question, Bell and Blanchflower perform a cohort analysis aiming at capturing the (truly) long-run impact of youth unemployment by using the detailed NCDS cohort data. These data allow them to unveil the association between on the one hand youth unemployment and on the other hand wages (and happiness) at the age of 50 after accounting for the impact of a few important potential confounders such as IQ, math scores, and reading scores. The association is found to be very large: each month of unemployment as a young boy or girl is claimed to reduce wages at the age of 50 by more than one percentage point.[2]

[2] Previous versions also showed strong effects on unemployment at the age of 50.

An important issue for Bell and Blanchflower's conclusion that a more expansionary fiscal policy can be motivated by a need to assist unemployed youths is whether the impact of recessions is *larger* for youths than for older workers. Here, Bell and Blanchflower claim to provide relevant evidence since the association between later unemployment and wages is smaller than the association between early unemployment and wages in the same regression. However, the regressions attempt to identify a very difficult parameter. Many unknowns are likely to confound the estimates and, importantly, these confounders are all likely to bias the estimates upwards. Social problems, drug use, differences in attitudes, health problems, and occupational choices are just a few examples of factors which are likely to be associated with a high risk of youth unemployment and also likely to have an independent impact on future wages. In my own previous work (Skans 2004), I found that the estimated impact of youth unemployment diminished dramatically when more controls were included in a similar regression. For example, after including family fixed effects, I could no longer detect any significant impact of youth unemployment beyond a six-year horizon. Naturally, these estimates may still be biased (as pointed out by Bell and Blanchflower) but, importantly, they would then be *upward* biased. Given the earlier literature, the huge impact of youth unemployment in the British context found by Bell and Blanchflower therefore seems somewhat implausible.

Finally, Bell and Blanchflower show results suggesting that unemployed youths are more optimistic about their labor market prospects than older unemployed and ask the question whether they are right to be so. This question is easier to answer for the simple reason that it does not require the identification of any causal parameter. If they fare better on average, they should be more optimistic. Quarterly transition rates calculated by Statistics Sweden (based on the Swedish Labor Force Surveys, AKU) show that 65 percent of the unemployed aged 25-54 remained unemployed a quarter later during 2009, whereas the corresponding number was 50 percent for youths. This is consistent with what we know from most statistical sources: young unemployed workers fare better than older unemployed workers on average. The main reason is (most likely) that unemployment among the young is a more widespread phenomenon than among older unemployed and that the latter are much more negatively selected on average. The high youth unemployment numbers are mostly

driven by a high inflow into unemployment, whereas unemployment among older workers is more often driven by a low outflow.

Bell and Blanchflower's conclusion is that an important policy goal in a recession is to strive for general increases in the demand for labor, or to balance the demand in favor of younger workers. I would rather conclude that the main lessons regarding youth unemployment from the Great Recession is that bad times are bad for youths and adults alike, that the policies which best help the youths enter the labor market in good times also help them best in bad times, and that youths who become unemployed in bad times (as well as good times) on average fare better than older workers who become unemployed at the same time.

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Employment consequences of employment protection legislation*

*Per Skedinger***

Summary

This article surveys the literature and adds to the evidence on the impact of employment protection legislation on employment. While stringent employment protection contributes to less turnover and job reallocation, the effects on aggregate employment and unemployment over the business cycle are more uncertain. Exploitation of partial reforms and the use of micro data in recent research appear not to have affected results regarding employment and unemployment in any systematic way. Labour market prospects of young people and other marginal groups seem to worsen as a consequence of increased stringency of the legislation. It is debatable whether marginal groups have gained much from the widespread policy strategy to liberalize regulations of temporary employment and leave regulations of regular employment intact. My own analysis suggests that increased stringency of regulations for regular work is associated with a higher incidence of involuntary temporary employment, particularly among the young.

Keywords: Job security, employment effects, employment protection reforms.
JEL classification numbers: J23, J5, K31.

* I thank Bertil Holmlund for useful comments, Aron Berg for able research assistance and the Jan Wallander and Tom Hedelius Research Foundation for generous financial support.
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Two decades have elapsed since Edward Lazear's seminal cross-country study on the employment effects of employment protection legislation (Lazear, 1990). Since then the measurement of the stringency of legislation has improved in several ways: from narrow indices to more comprehensive ones, from coverage of few countries to larger selections and from time-invariant measures to incorporation of annual frequency data. In addition, the use of micro data has become widespread, in contrast to the earlier literature which was largely based on aggregate data.

A relatively recent development in the research is the exploitation of partial employment protection reforms within countries. By the design of such reforms, suitable control groups arise naturally inasmuch as certain firms or groups on the labor market are not subject to the reforms, thereby minimizing the dependency on possibly mismeasured indices.

All in all, these developments give more opportunity for reliable identification of the true employment consequences of employment protection legislation. Yet, employment protection legislation remains a complex and controversial institution, whose employment effects continue to elude researchers.

The purpose of this article is to survey and discuss the ever-expanding literature on employment effects of employment protection legislation. This research includes studies on the level of employment and unemployment and their distribution across demographic groups, personnel turnover and job reallocation.[1] The article also describes the design of employment protection across countries, its evolution over time and adds to the empirical evidence concerning its effects.

Not only has employment protection become an important topic in the institutional approach to labour markets, these markets have also changed in ways that make questions of employment protection more pressing than before. Increased globalization and rapid technological innovation place demands on the ability to adapt for both businesses and employees while, at the same time, there is a legitimate need for a safety net for those workers who are adversely affected by the changes. Moreover, the challenges of the recent worldwide recession have brought employment

[1] For a recent survey that also includes studies dealing with effects on wages, firm dynamics, growth, productivity, sickness absence, perceived job security and psychological well-being, see Skedinger (2010).

protection issues to the forefront on the policymaking agenda and they are likely to remain there for years to come.

In order to provide a background to the empirical research, Section 2 contains a brief discussion of theoretical work and Section 3 describes the design and evolution of employment protection legislation in industrialized countries. The regulation typically imposes limitations on the employer's ability to fire employees and use temporary workers. The single most important element in the legislation is the definition of "unfair" dismissal (or dismissal without "just cause") and the penalties imposed on employers for such dismissals. There are great differences across countries in the strictness of their regulations and these differences seem to be relatively constant over time – but there has been a tendency towards convergence in stringency since the 1980s. Many European countries have liberalized the regulation of temporary contracts, while leaving the regulation of permanent jobs basically unchanged. This section also discusses the degree to which regulations are differentiated regarding various kinds of firms or groups within the labour market. Some countries, like Sweden, have far-ranging optional laws, allowing parts of the regulation to be set aside by mutual consent of employers and unions. An important issue is to figure out to what extent available measures of employment protection capture the apparent complexity of legislation. Section 3 also contains an analysis of involuntary temporary employment and its determinants.

The empirical literature is discussed extensively in Section 4. The presentation is organized according to the manner in which the studies were set up: Cross-country analyses with aggregate data, cross-country-studies with disaggregate data and within-country studies. About half of the studies are from the last few years, a development which reflects the increasing interest among researchers in issues related to employment protection.

The concluding section discusses what we have learned from the research so far and tries to assess its implications from the perspective of the recent financial crisis. What effects can we expect that the employment protection regulations had during the crisis – and will have, during its aftermath? The bulk of the present regulation of permanent work in most European countries was created many decades ago, when the labour market was substantially different. What does the research have to say

about the optimal design of employment protection legislation and is there a best way forward for reforming it?

1. What are the conceivable employment effects of employment protection legislation?

Firing costs do not only decrease the employer's inclination to lay off an employee, but also his or her willingness to hire new recruits. The latter effect is due to the fact that the firm incorporates potential future costs in the case of a lay-off already in the hiring decision. With higher firing costs, greater uncertainty regarding the factors which determine the size of the work force will make the company more reluctant to hire someone. For instance, it can be difficult to determine in advance how a new employee will fit into a work group or an organization and how this employee will manage the company's routines, especially if the employee in question lacks earlier work experience.

Taken together, the effects of a more stringent employment protection thus imply that employee turnover is reduced, since the flows into and out of the firms are smaller. One consequence of this is that average job tenures and unemployment durations are longer than in countries or sectors with less employment protection. Hence, the net effect on employment and unemployment is theoretically indeterminate and depends upon which of the two flows dominates (Bertola, 1999).

Another theoretical prediction is that employment protection will dampen swings in employment and unemployment over the business cycle. During a downturn, fewer employees are fired with stringent employment protection, while during an upturn, not as many employees are hired. The various stages in the business cycle can in themselves exert an influence on the uncertainty factors associated with hirings, which reinforces a disinclination to hire during economic lows. Lindbeck's (1993) analysis points to the possibility that employment protection has different effects depending on the stage of the business cycle and that unemployment can become permanent after a deep recession. Firms may become reluctant to take on new employees since they are uncertain as to how long the recovery will last. There are also some hypotheses which state

that stringent employment protection has more negative effects on employment after macroeconomic shocks (Blanchard and Wolfers, 2000).

Employment protection can also influence the composition of the employed and the unemployed at given levels of employment and unemployment (Bertola et al., 2007). In principle, the same fundamental mechanisms should be at work for all groups in the labour market, namely that both the likelihood of being fired and being hired is reduced. However, employment protection is usually designed in a manner that can influence different groups in different ways (as discussed in Section 2). Periods of notice and severance pay usually rise with longer tenure, which raises the risk of lay-off for individuals with short tenure. Vulnerable groups in the labour force are often overrepresented among those with short tenure. In certain countries, there are also legislated seniority rules. A rationale for differentiation according to age is that young individuals have a smaller opportunity cost than older individuals of not being employed, for example, when taking part in education (Belot et al., 2007).

Furthermore, uncertainty concerning a potential employee's productivity ought to be more explicit for groups with limited work experience or where the qualifications are not as easily verifiable as those of other groups (for instance, among immigrants with foreign education). Taken together, these factors speak for the possibility that vulnerable groups in the labour force, such as youth, immigrants, long-term unemployed and those with disabilities, are negatively affected by employment protection compared to other groups.

Up to now, the discussion has not considered the possibility that wages can be affected by employment protection. The effects on wages are ambiguous, however. On the one hand, wages can be reduced if employers demand compensation for higher firing costs (Lazear, 1990). In this case, it is far from certain that the total costs for an employer increase with employment protection legislation. If total costs do not increase, then employment is not affected either.[2] Collective agreements and minimum wages, however, can hinder wage adjustment to lower levels. According to some theories, there may also be an interaction between em-

[2] It should be noted that if employers incur firing costs in excess of benefits accruing to workers, in the form of red tape and legal costs, these additional costs may be detrimental to employment (Burda, 1992).

ployment protection and other labour market institutions which influences wage flexibility.

On the other hand, wages can rise as a consequence of employment protection, to the extent that the bargaining power of employees is increased relative to that of employers. Higher firing costs can create a group of so-called insiders within the company (Lindbeck and Snower, 2001). These people can have a relatively protected position, both in relation to other employees, who might have, for example, temporary jobs, and to those outside the firm who might be willing to work for a lower wage than what the insiders receive. Certain components in employment protection legislation, such as notification times, severance pay and seniority rules, can improve the position of insiders and therefore drive up their wages. Wage inflation due to increased bargaining power of insiders should contribute to lower employment and higher unemployment. To the extent that employment protection reduces the probability of finding a job in case an insider is actually laid off, there is, however, also an opposing effect that serves to reduce wage pressure.

A common reform strategy in Europe has been to liberalize the rules for temporary employment, but to leave the regulation for permanent employment intact (further discussed in Section 2). According to Blanchard and Landier (2002) and Cahuc and Postel-Vinay (2002), such policies can have negative consequences. Employers can be induced to fire temporary employees even if they are productive, since otherwise they would become permanently employed insiders, with higher firing costs. This can lead to an excess of employee turnover and increased unemployment, which can undermine the advantages gained through increased flexibility for the firms.

2. The design and evolution of employment protection legislation

Employment protection legislation covers three main areas: regular employment, temporary employment and collective dismissals. Regulation regarding regular work deals with the definition of just cause for dismissal, time limits for notification, severance pay and other procedural rules in connection with dismissals. Further restrictions, such as notice to a

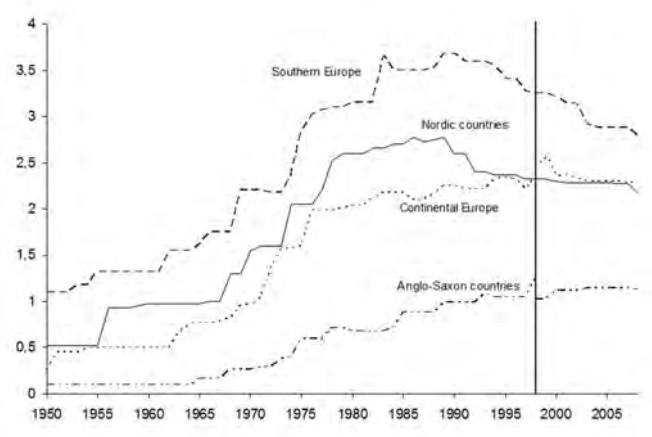
union or public employment service, may apply if a dismissal is defined as collective. Temporary work is regulated by time limits and valid reasons for fixed-term contracts and by defining which kinds of work can be used from temporary work agencies.

2.1 Evolution over time

One way of getting a summary view of the strictness of the legislation is to construct an index, that is, a measure that considers the legislation in its entirety by assigning weights to its various components. The OECD has constructed the most comprehensive index in this respect. This index considers regulations within the main areas of regular employment, temporary employment and collective dismissals. The index has a round number scale between 0 and 6, where the highest number represents the most stringent legislation. The OECD has updated and enlarged its index continuously since the 1990s, both with regard to the components of the index and the number of countries included. The latest version refers to the conditions of the year 2008 and includes, besides the OECD countries, a selection of developing countries and transition economies.

Figure 1 depicts the development of employment protection during the period 1950-2008 in various groups of OECD countries. This figure is based on Allard's (2005) extension backwards in time of the OECD's (2004) index for specific countries up to 1998 and on the OECD index for 1998-2008. As the series constructed by Allard excludes some components in the legislation that are considered by the OECD, figures for the two periods are not exactly comparable (as indicated by a vertical line in the figure). I have aggregated the countries into four groups, where the countries in each group have roughly similar levels of employment protection.

Figure 1. Stringency of employment protection legislation in OECD countries, 1950-2008, index



Source: OECD for 1998-2008 and Allard (2005) for 1950-1998.

Notes: The scale of the index is 0-6, where 6 represents the most stringent legislation. The series for 1998-2008 is based on the OECD's index (version 2) for regular employment, temporary employment and collective dismissals. The series for 1950-1998 is based on the OECD's index, excluding two components in regulations for regular employment, "delay to start a notice" and "compensation for unfair dismissal". The break in the two series is indicated by a vertical line. Southern Europe = Greece, Italy, Portugal and Spain. Continental Europe = Austria, Belgium, France, Germany, Netherlands and Switzerland. Anglo-Saxon countries = Australia, Canada, Ireland, New Zealand, United Kingdom and the United States. Nordic countries = Denmark, Finland, Norway and Sweden. Author's aggregation of country data, unweighted averages.

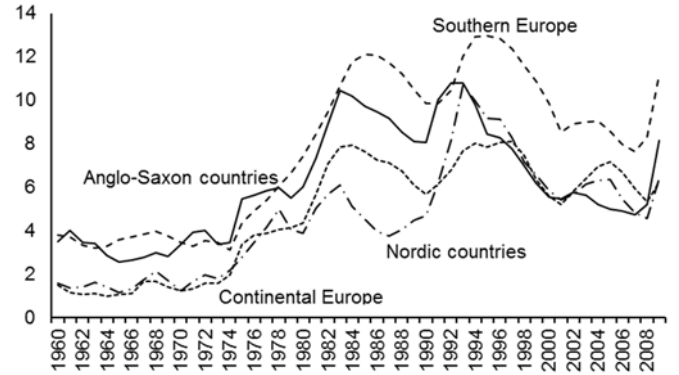
The four groups of countries in Figure 1 are Southern Europe, the Nordic countries, Continental Europe and the Anglo-Saxon countries. The stringency of employment protection varies greatly among many of the country groups and it has increased overall since 1950. However, the level of employment protection has remained more stable since the beginning of the 1980s.[3] In 2008 the average index of the six-level scale ranged between 1.1 (Anglo-Saxon countries) and 2.8 (Southern Europe), whereas the Nordic countries and Continental Europe show a similar level of employment protection (at about 2.2). There are tendencies towards convergence; since the beginning of the 1990s, legislation has become more liberal, especially in Southern Europe and the Nordic countries, while employment protection in the Anglo-Saxon countries has become somewhat stronger compared to the mid-1980s. Otherwise, the

[3] This development may be contrasted to the deregulation of product markets, where the value of the relevant index has declined from around 5 to around 2 for 21 OECD countries during the period 1980–2003 (OECD, 2006).

predominant impression is that the differences between the groups of countries are strikingly robust.

Figure 2 shows unemployment levels in the same country aggregates during the period 1960-2009. As in the previous figure, a trend increase is noted up until the 1990s, with the exception of Anglo-Saxon countries where the rising trend is broken already at the beginning of the 1980s. Unemployment has usually been higher in Southern Europe than in the other groups. Excluding a short period during the 1990s, the Nordic countries have had low unemployment compared to other countries. The Anglo-Saxon countries show a relatively high unemployment rate during much of the period considered, but since the mid-1990s, they have had a lower unemployment rate than the other groups of countries. With the onset of the financial crisis, there is a palpable increase in unemployment in all country groups in 2009.

Figure 2. Unemployment in OECD countries, 1960-2009, per cent of labour force



Source: OECD.

Note: See note to Figure 1 for information about the countries included and the aggregation procedure.

Table 1. Stringency of employment protection legislation in OECD countries, 2008, index

Country	Summary index	Regular employment (weight 5/12)	Temporary employment (weight 5/12)	Collective dismissals (weight 2/12)
Australia	1.4	1.4	0.8	2.9
Austria	2.4	2.2	2.3	3.3
Belgium	2.6	1.9	2.7	4.1
Canada	1.0	1.2	0.2	2.6
Czech Republic	2.3	3.0	1.7	2.1
Denmark	1.9	1.5	1.8	3.1
Finland	2.3	2.4	2.2	2.4
France[a]	2.9	2.6	3.5	2.1
Germany	2.6	2.9	2.0	3.8
Greece	3.0	2.3	3.5	3.3
Hungary	2.1	1.8	2.1	2.9
Iceland	2.1	2.1	1.5	3.5
Ireland	1.4	1.7	0.7	2.4
Italy	2.6	1.7	2.5	4.9
Japan	1.7	2.1	1.5	1.5
Korea	2.1	2.3	2.1	1.9
Luxembourg	3.4	2.7	3.9	3.9
Mexico	3.2	2.3	4.0	3.8
Netherlands	2.2	2.7	1.4	3.0
New Zealand	1.2	1.5	1.1	0.4
Norway	2.7	2.2	3.0	2.9
Poland	2.4	2.0	2.3	3.6
Portugal[a]	2.8	3.5	2.5	1.9
Slovakia	2.1	2.5	1.2	3.8
Spain	3.1	2.4	3.8	3.1
Sweden	2.1	2.7	0.7	3.8
Switzerland	1.8	1.2	1.5	3.9
Turkey	3.5	2.5	4.9	2.4
United Kingdom	1.1	1.2	0.3	2.9
United States	0.9	0.6	0.3	2.9
OECD average	2.2	2.1	2.1	3.0

Source: OECD.

Notes: [a] 2009. The scale of the index is 0-6, where 6 represents the most stringent legislation. Unlike earlier versions, the OECD index (version 3) incorporates three additional components of legislation: "the maximum time allowed for an employee to make a claim of unfair dismissal"; "administrative authorization and regular reporting requirements for temporary work agencies"; and "the requirement for temporary work agency workers to receive the same pay and conditions as regular workers at the user firm".

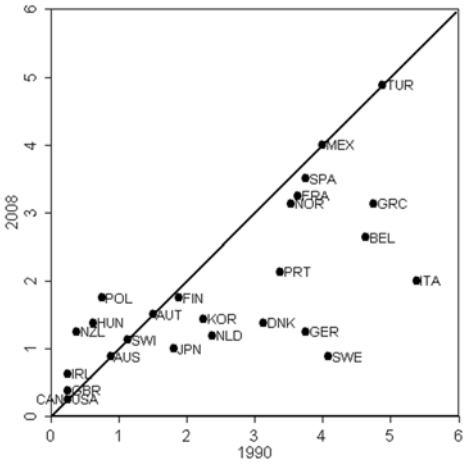
Observations such as those in Figures 1 and 2 have prompted a discussion among researchers regarding to what degree increased unemployment in Europe can be explained by stringent employment protection. A certain correlation, although far from perfect, between levels of employment protection and unemployment can certainly be drawn from the two figures. The question of possible cause and effect is complicated, however, since, among other things, employment protection became stricter at least a decade before the strong rise in unemployment took place in the mid-1970s. It can also be noted that during the crisis year 2009, unemployment shot up the most in Southern Europe and the Anglo-Saxon countries, and with about as much in percentage terms, despite the two country groups having quite different levels of employment protection.

How stringent is employment protection in individual OECD countries? Table 1 shows both the OECD's summary index and its separate indices for regular employment, temporary employment and collective dismissals. The information refers to 2008 and includes, in addition to the "old" OECD countries in Figures 1 and 2, Japan and the new member countries in Eastern Europe, Asia and Latin America.

The United States, Great Britain and Canada have the least stringent legislation according to the summary index (ranging between 0.9 and 1.1), while Turkey, Luxembourg, Mexico, Spain and Greece have the most extensive (3.0-3.5). An important change in American legislation since the 1980s is that an increasing number of states have introduced the possibility for employees of having the question of just cause for dismissal tried in court. Even considering these changes as more restrictive, the United States is still the country ranked as the most liberal by the OECD as far as employment protection is concerned.

Among the Nordic countries, Denmark stands out with less stringent employment protection than its neighbours. Denmark is usually put forward as the prime example of the much-heralded flexicurity model, which combines flexible hiring and firing rules with generous unemployment benefits. However, it is difficult to attribute the relatively low unemployment rate in Denmark since the 1990s to the flexicurity model, since the country experienced much higher unemployment in the 1970s and 1980s with basically the same employment protection legislation (Andersen and Svarer, 2007).

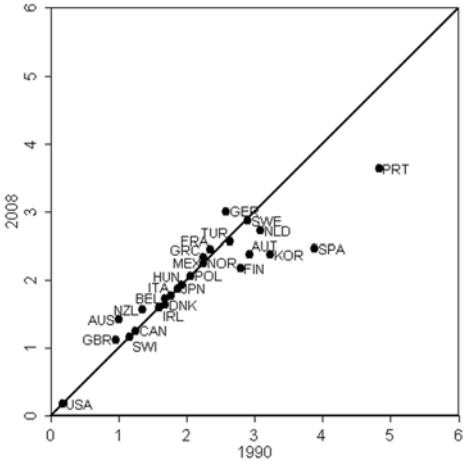
Figure 3.a. Reforms of employment protection legislation regarding temporary work in OECD countries



Source: OECD.

Notes: The indices (version 1 of the OECD index) on the axes indicate the stringency of legislation at the respective point in time. The lower half in the figure contains those countries which liberalized legislation in the intervening period. The vertical axis refers to 2009 for France and Portugal. The positions of Canada and the United States overlap exactly.

Figure 3.b. Reforms of employment protection legislation regarding regular work in OECD countries



Source: OECD.

Note: See note to Figure 3.a for further details.

In Figure 1, it could be noted that legislation has been somewhat liberalized in some of the groups of OECD countries since the 1980s. Liberalization has not been equally distributed across the three main areas of legislation, however, but has almost exclusively been related to rules for temporary employment. In Figure 3a, the strictness of legislation regarding temporary employment in 2008 (the vertical axis) is compared to the conditions during 1990 (the horizontal axis). In the lower half of the figure, countries which have liberalized their regulations during this period are shown, and most of the observations are found in this half. Italy and Sweden are among the countries with the sharpest reduction in the stringency of regulation. Among important reforms in Sweden during the period were the legalization of temporary work agencies in 1993 and the introduction of the "general fixed-term employment" contract in 2007, which allowed temporary work for any reason and up to 24 months within a period of five years with the same employer.[4]

In contrast, the corresponding figure for regular employment (Figure 3b) displays a cluster of countries on or close to the 45-degree line, which means that no or very modest reforms have been undertaken. Portugal and Spain stand out as exceptions. In Portugal, a reform of dismissal regulations in 2009 involved, among other things, reductions in the delay before a notice periods starts and reduced notice periods for workers with short tenure. The reform was achieved with complementary reforms in social policy. In Spain, the definition of just cause for dismissal was widened in 1994 and the firing costs for certain groups of permanent employees were reduced in 1997.

A possible explanation for the fact that reforms were undertaken in so many parts of Europe may be that the legislation regarding employment protection, rightly or wrongly, was understood as a contributing reason for a persistently high unemployment rate, which led to political pressure to bring about change. The fact that the reform strategies were so one-sidedly biased vis-à-vis the terms of temporary employment contracts can be due to political pressure from the noticeably larger and more well-organized groups with permanent employment.

[4] Cahuc (2010) provides a detailed discussion of employment protection reforms undertaken in Sweden.

2.2 Are all equal before the law?

One shortcoming of available indices on employment protection is that they are only constructed for a "typical worker" and provide little or no information about the coverage of the legislation, for example, to what extent regulations differ for different types of firms or workers.[5] This means that the picture of employment protection is far from complete.

A potentially important omission in this respect is that information is lacking about the extent to which small firms are exempted from employment protection legislation. One rationale for having more liberal rules for small firms is that these firms are more sensitive to the cost-increasing effects of employment protection than larger firms. This may be due to fixed costs of employment protection being divided among fewer employees and a smaller potential for spreading risks. There may also be reasons for not exempting small firms, for example, if the growth of small firms is impeded due to incentives not to cross the size threshold where exemptions do not apply, or if it is believed that the special interests of small firms are already provided for in the actual implementation of the legislation by the courts (as has been argued in the Swedish case by Ahlberg et al., 2006).

Exemptions from employment protection legislation for small firms are widespread in OECD countries, but the size threshold varies across countries as does the extent to which small firms are exempt. Details on exemptions for small firms in 19 OECD countries are reported by Venn (2009). The number of workers affected by the exemptions, as a share of total employment, varies from 20 per cent in Korea to more than half in Australia, Spain, Italy and Turkey. Venn (2009) argues that small-firm exemptions are not a major source of inaccuracy in the overall OECD index, although in some countries a large proportion of workers are affected by the exemptions.

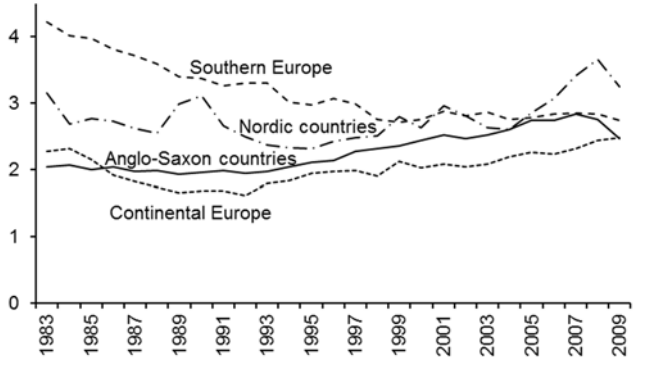
Is the regulatory framework different for different groups in the labour market? It seems to be relatively common to differentiate between blue- and white-collar workers and to impose stronger employment protection for the latter group (OECD, 1999). In many countries, apprentices, participants in training or labour market programmes and disabled workers are

[5] In fact, much of recent research on the effects of employment protection exploits the possibilities for identification provided by differential enforcement across types of firms. This literature is discussed in Section 3.3.

exempt from legislation (although anti-discrimination laws still apply). According to Venn (2009), few workers are affected by these targeted exemptions, typically less than 2 per cent of the labour force.

In most countries, the period of notice and severance pay (if applicable) increase with job tenure. In practice, this means that young people, who tend to have shorter tenure than others, are less protected than other groups. Seniority rules are also likely to have a differential impact depending on age and should contribute to increase the probability of dismissal for young workers. Since some groups are overrepresented among those with temporary employment, it is clear that regulations in this respect also have a differential impact across workers, even though the legislation may not be explicitly treating these groups differently. While a temporary job may be a stepping stone to permanent employment, there is also a risk for the creation of a dual labour market, with a core of permanent employees holding relatively secure jobs and a large group of workers circulating between temporary jobs and periods of unemployment. Workers with a temporary contract typically have less employment protection than permanent employees.

Figure 4. Relative youth unemployment in OECD countries, 1983-2009



Source: OECD.

Notes: Relative youth unemployment is the unemployment rate for individuals below 25 years of age relative to that of those aged 25-54 (except for Austria, where the relation is to total unemployment). New Zealand and Switzerland are excluded due to lack of data. See note to Figure 1 for information about the countries included and the aggregation procedure.

Figure 4 shows the unemployment rate among youth, relative to that of 25-54-year-olds, during the period 1983-2009 for the same aggregate

of countries as in Figures 1 and 2. No clear relationship between the strength of employment protection and the rate of unemployment among the youth as compared to older individuals in the various country groups can be discerned. There is a convergence in relative unemployment, from which only the Nordic countries diverge. In 2009, unemployment among the youth was around 2.5 times higher than unemployment in the older labour force in Continental Europe, Southern Europe and Anglo-Saxon countries and more than three times higher in the Nordic countries. It is noticeable that the European reforms concerning temporary employment during this period are not reflected in lower relative youth unemployment, with the possible exception of Southern Europe.

2.3 Implementation and enforcement

The legislative complexity regarding employment protection makes it difficult to capture the stringency of legislation in available indices. In addition, differences in the implementation and enforcement of the law make it harder to find a true picture of the situation. Judicial interpretations of certain legal regulations – for example, what constitutes a just cause for dismissal – are not easy to quantify and the inclination to go to court with a dispute involving employment protection can vary across countries. The laws can also be optional, that is, they can be set aside by contract, in collective bargaining or otherwise.[6]

Some studies have investigated whether variations in macroeconomic conditions, above all the state of the business cycle, influence the implementation of legislation regarding employment protection (see, for example, Marinescu, 2011). The manner in which an economic downturn could influence the attitude of judges is not necessarily clear. On the one hand, the negative consequences of a firing are probably more pronounced for an employee in times of recession. On the other hand, the firm may also find itself in a precarious situation and at the risk of shutting down.

[6] Another potential problem is deficiencies in the legal system, making assumptions regarding the rule of law questionable. This kind of problem is often pervasive in developing countries and will not be further discussed here.

Table 2. Reforms of terms of notice for employer-initiated separations in selected collective agreements in Sweden, 1997-2001

Industry	Manual workers			Non-manual workers		
	Pre-reform rules	Post-reform rules	Date of reform	Pre-reform rules	Post-reform rules	Date of reform
Engineering	Old EPA, age-based	New EPA, tenure-based	1997	CA-NM, age/tenure-based	New EPA, tenure-based	2001
Construc-tion	CA-C, age-based	New EPA, tenure-based	2000-01	CA-NM, age/tenure-based	New EPA, tenure-based	1998
Retail	Old EPA, age-based	New EPA, tenure-based	2001	Various	Various	Various

Source: Heyman and Skedinger (2011).

Notes: Old (New) EPA = rules in accordance with the Employment Protection Act up to 1997 (after 1997); CA = rules specific to collective agreement for manual workers in construction (C) or for non-manual workers (NM) in general. Implementation for non-manual workers in retail varies depending on the specific agreement.

Another important aspect regarding the implementation of the law concerns collective bargaining and optional regulations. Sweden belongs to those countries in which the possibilities that a collective agreement can diverge from the legal regulations are especially far-reaching (Rönnmar, 2006). Departures from legislation in collective agreements can go either way in Sweden – in a more liberal or a more restrictive direction. In other countries, it appears to be the rule that collective agreements specify more restrictions in relation to the relevant legislation (OECD, 1999; Venn, 2009). In many collective agreements, for instance in the United States, seniority rules are stipulated (OECD, 1999; Kugler and Saint-Paul, 2004). If the coverage of the collective contract is low, which is the case in the United States, few people are affected by exceptions. Just as the decisions laid down by the courts appear to be influenced by the business cycle, so can the frequency and contents of those exceptions which can be considered optional be influenced by macroeconomic conditions. However, little is known as to how far this extends.

Table 2, taken from Heyman and Skedinger (2011), illustrates a case of differential implementation of Swedish employment protection legisla-

tion in a selection of industries with different collective agreements. In 1997, a reform in the Employment Protection Act (EPA) stipulated that the length of notice in case of employer-initiated separations be based on tenure instead of age. This reform was implemented immediately, as it gained legal force, for blue-collar workers in the Engineering Agreement, but with a lag of up to four years in other agreements (white collar-workers in engineering, blue- and white-collar workers in construction and retail). During the period preceding implementation, the lagging agreements either observed notice regulations of their own or those prevailing in the pre-reform EPA (blue-collar workers in retail). Clearly, an analysis of the employment effects of the reform based on the naïve assumption of homogeneous, across-the-board implementation is likely to yield misleading results.

The perhaps most important omission in the OECD index is information on the actual enforcement of the legislation, a deficiency that the index shares with all other available alternatives. The OECD has the ambition to incorporate some aspects of both judicial decisions and optional rules via collective agreements when compiling their index, but information of this kind is decidedly lacking.

2.4 Involuntary temporary employment

The one-sided reform strategies in many European countries regarding regulation for regular and temporary work may have affected the labour market in several ways (which will be discussed in more detail in Section 3). One aspect, with potentially important welfare implications, is the extent to which workers regard their temporary positions as involuntary. Students working part-time or new entrants in the labour market trying out different jobs before deciding on a career may not be very interested in a permanent position. Workers beyond the initial phase of their labour market careers typically prefer a regular contract, though, as this increases job security and may also be a requirement for access to various services, such as renting a flat or borrowing from financial institutions.

The regressions in Table 3 represent an attempt to gauge the importance of employment protection legislation for involuntary temporary employment. The table displays cross-country regressions on an unbalanced panel of 20 European countries over the period 1985-2009. The

dependent variables are based on survey data, collected by Eurostat, on the share of temporary workers in three different age groups (15+, 15-24 and 25-49) who consider their temporary job as being involuntary.[7]

Since the dependent variables are relative (involuntary temporary employment as a percentage of total temporary employment), the extent of temporary employment as a whole is taken as given in the regressions. This should mitigate problems with reverse causality, in relation to the alternative with an absolute measure of involuntary temporary employment. The latter measure is related to the number of workers on fixed-term contracts, which may well influence the stringency of employment protection regulations. The regressions in Table 3a include as explanatory variables the unemployment rate (UNEMP), the OECD's indices for regulation of regular work (EP_R) and temporary work (EP_T), and a trend. The first three columns are based on the full sample. Unemployment contributes significantly to relatively more of involuntary temporary employment in all regressions. This is hardly surprising, since higher unemployment is likely to weaken the bargaining position of workers. Increased stringency in the employment protection indices seems in both cases to be associated with a larger share of involuntary temporary work.[8] Young people seem to be particularly sensitive to regulation of permanent jobs; the coefficient for EP_R is substantially larger than the one for EP_T. An increase in the former index by one unit increases the share of involuntary temporary employment by 9.75 percentage points, while the corresponding figure for the latter index is 3.28. Stringent protection of regular work could make it more difficult to immediately find regular work and to transit from a temporary contract to a permanent one.

[7] The dependent variables relate to those who have stated the response "Could not find permanent job" as the main reason for their temporary job. The other response alternatives are "Did not want a permanent job", "Education and training" and "Probationary period".

[8] The correlation between EP_R and EP_T in the data is modest (0.21) and should present no problem in the estimations.

Table 3.a. Regressions for involuntary temporary employment, various age groups, 1985-2009

Variable	Full sample			Sample with EP_R>2 & EP_R>EP_T			Full sample Time fixed effects			Full sample Country fixed effects			Full sample Both time and country fixed effects		
	15+	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**
UNEMP	2.75	3.12	2.42	3.21	3.90	2.76	2.80	3.21	2.45	0.98	1.62	0.63	0.73	1.13	0.37
	(10.16)	(10.55)	(10.28)	(8.53)	(9.31)	(7.85)	(9.94)	(10.38)	(10.00)	(3.60)	(6.52)	(2.45)	(2.10)	(3.61)	(1.13)
EP_R	5.56	9.75	4.34	11.17	22.40	8.44	5.62	9.81	4.43	5.99	6.65	3.61	3.61	1.92	2.29
	(4.64)	(7.60)	(4.18)	(3.82)	(6.91)	(3.09)	(4.58)	(7.41)	(4.16)	(1.84)	(2.25)	(1.18)	(0.99)	(0.58)	(0.67)
EP_T	4.79	3.28	3.67	7.52	-2.13	4.32	4.55	3.21	3.40	-0.39	1.13	1.17	-2.18	-1.83	-0.26
	(6.65)	(4.23)	(5.87)	(2.93)	(0.75)	(1.80)	(6.08)	(3.96)	(5.24)	(0.40)	(1.27)	(1.27)	(1.62)	(1.50)	(0.20)
TREND	0.21	-0.03	0.18	-0.03	-0.48	-0.17									
	(1.30)	(0.19)	(1.28)	(0.08)	(1.31)	(0.57)									
Mean of dep. var.	58.32	48.65	68.61	58.02	50.06	68.64	58.32	48.65	68.61	58.32	48.65	68.61	58.32	48.65	68.61
R-sq (adj)	0.354	0.385	0.335	0.472	0.496	0.389	0.329	0.356	0.313	0.199	0.381	0.274	0.077	0.150	0.173
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.017	0.169	0.000	0.242
No. obs.	332	324	331	137	137	137	332	324	331	332	324	331	332	324	331

Table 3.b. Regressions for involuntary temporary employment, various age groups, 1985-2009

Variable	Full sample			Sample with EP_R>2 & EP_R>EP_T			Full sample Time fixed effects			Full sample Country fixed effects			Full sample Both time and country fixed effects		
	15+	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**	**15+**	**15-24**	**25-49**
UNEMP	2.97	3.13	2.59	2.57	2.54	2.22	3.02	3.21	2.60	1.15	1.86	1.00	1.01	1.41	0.73
	(9.95)	(9.20)	(10.08)	(6.06)	(5.30)	(5.99)	(9.70)	(9.01)	(9.74)	(3.94)	(6.95)	(3.69)	(2.75)	(4.28)	(2.17)
EP_GAP	-3.16	-1.70	-2.35	-1.23	2.42	-0.02	-3.08	-1.70	-2.22	-0.99	-1.26	-2.52	-0.56	-0.75	-1.91
	(5.12)	(2.46)	(4.44)	(1.04)	(1.81)	(0.02)	(4.85)	(2.36)	(4.08)	(1.19)	(1.66)	(3.24)	(0.63)	(0.93)	(2.32)
TREND	-0.06	-0.22	-0.03	-1.29	-1.75	-1.07									
	(0.37)	(1.17)	(0.20)	(4.13)	(4.97)	(3.91)									
Mean of dep. var.	58.32	48.65	68.61	58.02	50.06	68.64	58.32	48.65	68.61	58.32	48.65	68.61	58.32	48.65	68.61
R-sq (adj)	0.250	0.219	0.247	0.284	0.289	0.271	0.227	0.180	0.227	0.255	0.222	0.181	0.246	0.215	0.191
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.271	0.000	0.078
No. obs.	332	324	331	137	137	137	332	324	331	332	324	331	332	324	331

Sources: Own calculations, based on data from Eurostat (dependent variables, UNEMP) and OECD (EP_R, EP_T, EP_GAP).

Notes: Dependent variables = percentage of temporary workers who report that they "could not find permanent job" as the main reason for temporary employment. UNEMP = unemployment rate. EP_R = OECD index for regulation of regular work. EP_T = OECD index for regulation of temporary work. EP_GAP = (EP_R-EP_T)/EP_T. Observation periods: Austria 1995-2003, 2006-08; Belgium 1985-2008; Czech Republic 1997-2008; Denmark 1985-2008; Germany 1996-2008; Finland 1995-2008; France 2003-2009; Greece 1985-2008; Hungary 1997-2008; Ireland 1985-2008; Italy 1985-2008; Netherlands 1985, 1987-2008; Norway 1995-2008 (15+), 1995-97, 2006-08 (15-24), 1995-2004, 2006-08 (25-49); Poland 2001-08; Portugal 1986-2009; Slovak Republic 1998-2008; Spain 1987-2004, 2006-08; Sweden 1995-2008; Turkey 2006-08; United Kingdom 1985-2008. Constants included but not reported. Absolute t-values within parentheses.

Why stringent regulation of temporary work should be associated with a higher incidence of involuntary temporary jobs seems less straightforward.

Columns 4-6 in Table 3a report regressions for a subsample of observations with stricter than average regulation of regular work and more stringent regulation of regular jobs than temporary ones, in relation to the regulation in other countries (EP_R > 2 and EP_R > EP_T). For this subset of observations, there is an even larger tendency for EP_R to dominate over EP_T in influencing the dependent variables, especially among those aged 15-24, while the estimates for UNEMP are not much different.

Regressions for the full sample with various fixed effects are presented in Columns 7-15. Time fixed effects (year dummies) do not change the results to any considerable extent as shown in Columns 7-9. Regressions with country fixed effects, implemented through "within" estimation, are reported in Columns 10-12. Country-specific factors, like apprenticeship systems with temporary positions in which education and training are important, are likely to influence the degree to which workers report that their temporary work is involuntary (rather than stating "Education and training" as the main reason). The estimates for UNEMP remain positive and significant, as does the estimate for EP_R overall and among the young, but the magnitudes are reduced. The coefficients for EP_T are rendered insignificant. The fixed-effects regressions confirm the impression that EP_R is more important than EP_T for involuntary temporary employment, especially as far as youth are concerned, but it should be noted that there is relatively little variation in both EP_R and EP_T, and especially in EP_R, within countries. Both time and country fixed effects are included in the final three columns in Table 3b. The coefficients of EP_R and EP_T are insignificant, but this is not the case for UNEMP (except in the regression for 25-49-year-olds).

Table 3a repeats the basic format of Table 3b with the relative difference in stringency of regulations, EP_GAP, defined as (EP_R-EP_T)/EP_T, included instead of EP_R and EP_T.[17] The gap variable comes out negatively in most regressions, but is positive and borderline significant for young people in the subsample with "high" protection of regular work and a more stringent regulation of regular jobs than tempo-

[17] This measure is used in OECD (2004) and corresponds to the theoretical concept in Blanchard and Landier (2002).

rary ones. With various fixed effects, most estimates of EP_GAP, with the exception of those for the 25-49 age group, are insignificant.

As checks for robustness, experiments with a different time period (1995-2009) and excluding countries in the sample with extensive apprenticeship systems (Austria, Denmark, Germany and the Netherlands) were performed. These checks yielded basically the same results as in Table 3a.[18]

My results indicate that it is mainly stringent regulation of permanent work that is associated with involuntary temporary work. Taken at face value, the findings suggest that the route taken by countries implementing one-sided reforms may well have entailed substantial costs in terms of lower welfare among temporary workers and that these costs are primarily borne by the young. A few caveats are warranted before drawing firm conclusions. First, the small degree of within-country variation in one of the variables of interest, regulation of permanent work, is cause for some concern. Moreover, even if a temporary job is subjectively regarded as involuntary, it could serve as a stepping stone to a permanent contract and thus enhance the individual's welfare in the future. If the alternative to a temporary job is unemployment, rather than regular work, temporary jobs should be welfare-improving. It is possible that the results do not only reflect that stringent regulation of regular work reduces access to such jobs, but also that regular employment becomes more attractive in relation to temporary work, making those in the latter type of employment more inclined to label it as "involuntary" or more eager to search for permanent jobs. Another concern with the estimates is the remaining potential for reverse causality, despite the choice of the share of involuntary temporary employment as the dependent variable. If, for example, the dissatisfaction with temporary work is increasing, this could influence the employment protection legislation. A policy response could be to change regulations for temporary work, possibly in a more stringent direction, while it seems less obvious that protection of regular employment would be reformed (for which the strongest results are obtained). Hence, I find it improbable that reverse causality distorts the main conclusions in the analysis, but it cannot be ruled out that the estimates are affected to some degree.

[18] With the shorter estimation period, EP_R turned out to be insignificant in some of the regressions for the age groups 15+ and 25-49.

3. Empirical studies on the employment effects of employment protection legislation

The presentation in this section is organized according to the manner in which the studies were set up: Cross-country analyses with aggregate data, cross-country-studies with disaggregate data and within-country studies. The review comprises the period from 1990 to the present.

3.1 Cross-country studies: Aggregate data

In these studies, cross-country variation in the stringency of employment protection is the main basis for identification of the effects. The development within the field has gone from pure cross-country analysis towards an increased use of panel data where variation over time is also considered.

One of the pioneering studies of the impact of employment protection on aggregate employment and unemployment is Lazear (1990). He uses data concerning notification time and severance pay for 22 different countries in the period 1956-1984. According to the results, employment is lower and unemployment (including long-term unemployment) is higher in countries with more stringent employment protection. The measure of the strictness of legislation is relatively narrow. In a later study, Lazear's (1990) study has been expanded in several respects by Addison and Teixeira (2005). Among other things, they add more years and explanatory variables to the analysis, a more comprehensive measure of employment protection is used and various robustness tests are carried out. The authors conclude that unemployment increases in most of the estimates, but the results concerning employment and long-term unemployment are much weaker than in Lazear's study.

In addition to constructing indices on a regular basis regarding employment protection, the OECD has also produced a number of influential studies regarding its effects. Their conclusions have been modified over time. Scarpetta (1996) and Elmeskov et al. (1998) analyse the effects on structural unemployment.[19] They find that unemployment increases with more stringent employment protection (the results are more robust in the

[19] Structural unemployment is based on estimations of the unemployment rate at which wage growth does not increase (NAWRU).

latter study). The OECD (1999) uncovers no relation, however, between employment protection and the level of unemployment and no strong relation for employment, but the flows into and out of unemployment decrease, while the duration of unemployment increases.[20] Similarly, Bassanini and Duval (2006) find no evidence that the stringency of legislation has any effect on aggregate unemployment. In the later OECD studies, the time periods considered are longer, the number of countries is greater and the index regarding employment protection is more comprehensive and with more observations over time in panel analyses (in the most recent one, yearly variation in the index is used). In addition, more robustness tests have been carried out.

The mixed results in the OECD studies concerning the effects on aggregate employment and unemployment are representative for the state of research in general among those studies which are based on cross-country aggregate data. On the one hand, there are a number of studies suggesting that employment falls or unemployment rises. These include, for example, Blanchard and Wolfers (2000), Botero et al. (2004), Di Tella and McCulloch (2005), Heckman and Pagés-Serra (2000) and Nickell (1997). On the other hand, there are studies indicating no effect at all, or that employment increases or unemployment falls. Allard and Lindert (2007), Baccaro and Rei (2007), Belot and van Ours (2004), and Garibaldi and Violante (2005) belong to this category.

As far as unemployment and employment in various demographic groups is concerned, however, there are more results which indicate adverse effects on young people (and in many cases women). Allard and Lindert (2007), Bertola et al. (2007), Botero et al. (2004), Heckman and Pagés-Serra (2000), OECD (2004) and Skedinger (1995) all find that more stringent employment protection diminishes employment or increases unemployment among these groups. However, there are examples of divergent studies where the effects on employment possibilities for youth are nonexistent (OECD, 1999).

One hypothesis in the literature is that the effects of employment protection are stronger if wages cannot be adjusted downwards in order to compensate for the increased costs due to the legislation. If insiders have a strong bargaining position in the labour market, this can reduce the possibilities for employers to shift the costs to the employees. It is fre-

[20] OECD (2004) finds similar results.

quently assumed that wage demands from insiders have less impact in either decentralized or centralized bargaining systems than in systems where wages are mainly negotiated at the industry level and where co-ordination is limited (Calmfors and Driffill, 1988).

This hypothesis gains some support in Elmeskov et al. (1998), who find that a more stringent legislation contributes to higher unemployment only at the intermediate level of bargaining. The results in the OECD study from 1999 show that stronger employment protection reduces unemployment if the centralization and co-ordination levels are high (that is to say, the relationship is linear and not hump-shaped). The results of Bassanini and Duval (2006) suggest a hump shape, but their findings are not robust. Belot and van Ours (2004), whose results indicate that employment protection has a negative effect on unemployment, also report results which suggest that this effect only comes into play when wage formation is decentralized.

A few studies have examined interactions between employment protection and macroeconomic shocks, in which the hypothesis is that a more stringent legislation (and rigidity in other labour market institutions) has stronger negative effects on employment when the economy is subject to disturbances. This may explain why the stable differences in the levels of employment protection over time and across countries did not have any influence on differences in unemployment during the 1950s and the 1960s, but may have had an influence thereafter. This hypothesis finds support in Blanchard and Wolfers (2000), who consider shocks in the form of changes in productivity and real interest rates as well as shifts in labour demand.

In a later study by Nickell et al. (2005), there are in most cases no significant interaction effects (they also control for shocks in monetary supply and import prices). Similarly, Bassanini and Duval (2006) find ambiguous results. Stringent legislation seems to dampen the unemployment-increasing effect in the short term in case of macroeconomic shocks, but prolongs the period required for unemployment to return to its previous level. Evaluating the effects of employment protection legislation on structural unemployment in economic downturns, Furceri and Mourougane (2009) find that crises increase structural unemployment in countries with above average stringency in employment protection.

The results in the various studies based on aggregate data point in different directions. It seems difficult to substantiate that there is a robust relationship between employment protection and aggregate employment or unemployment. The clearest findings appear to be that the flows into and out of employment and unemployment diminish, and that youth are adversely affected. Studies regarding other vulnerable groups, such as immigrants, appear to be scarce. There are also many results which suggest that interactions with other labour market institutions and macroeconomic shocks play a role, but the estimates are not very robust. In general, the studies continue to be plagued by little variation in employment protection within countries as well as potential problems with reverse causality, that is, the possibility that the labour market situation affects the stringency of legislation.

Cross-country studies using aggregate data thus have weaknesses, but one of their advantages is that they make it possible to consider general equilibrium effects. Studies with disaggregate data do not easily give information on aggregate effects.

3.2 Cross-country studies: Disaggregate data

The majority of studies within this still relatively unexplored area of the literature analyse effects of employment protection on job reallocation and firm dynamics. Only a few studies research effects on the level of employment.

Some studies examine job reallocation and its components, that is, the creation and destruction of jobs.[21] Job reallocation is substantial in all countries, but there are significant differences across industries (Haltiwanger et al., 2006). In this research area, the difficulties in finding comparable data have been considerable.[22] In some of the earlier studies, it has been observed that the aggregate reallocation of jobs is approximately the same in countries with differing levels of employment protec-

[21] Many studies follow the convention of Davis and Haltiwanger (1999), where job creation in any given industry is calculated as the weighted sum of employment increases in firms which have increased the number of employees and job destruction is calculated as the weighted sum of the absolute employment reductions in firms which have decreased the number of employees in the same industry. Job reallocation is the sum of job creation and job destruction.

[22] The difficulties in comparing across countries are related to (among other things) differences in (1) units of observation (firms or establishments); (2) size thresholds for inclusion in the data; and (3) coverage of various industries.

tion, which contradicts one of the few unambiguous predictions of the theory (see, for example, Bertola and Rogerson, 1997).

In later studies, in which more comparable data are available, it appears, however that the results are more aligned to theoretical predictions. Negative effects on job reallocation are found in Gómez-Salvador et al. (2004), Haltiwanger et al. (2006), Messina and Vallanti (2007), Micco and Pagés (2006) and Salvanes (1997). Furthermore, Messina and Vallanti (2007) find that stronger employment protection contributes to making job reallocation more pro-cyclical; that is to say, it increases more in upturns and decreases more in downturns. According to the authors, this means that employment protection above all reduces the sensitivity of job destruction to the various stages in the business cycle.

Boeri and Garibaldi (2009) uncover a positive relationship between mobility and the lower stringency of employment protection that characterizes many European countries since 1985. Mobility is measured in several ways, as unemployment inflows and outflows, mobility across labour market states and as job-to-job flows.

Only a few studies consider the effects on the level of employment and its composition. Micco and Pagés (2006) find that employment decreases with more stringent employment protection and that this effect is mainly due to fewer new firms, whereas employment in existing companies is not affected. The effects of employment protection on the employment of immigrants have been investigated by Causa and Jean (2007) and Sá (2008). Both studies differentiate between regulation for permanent and temporary contracts. Causa and Jean (2007) find that a larger difference in stringency between the two increases employment among immigrants. The results in Sá (2008) indicate that, among natives, stronger regulation for permanent contracts decreases employment and regulation for temporary contracts increases employment, while immigrants are much less affected in general. She argues that immigrants are less aware of employment protection legislation than natives and therefore less likely to claim their rights.

More stringent employment protection can lead to employers being more selective in their recruiting of new employees. Daniel and Siebert (2005) demonstrate that the educational level of new employees rises in countries with stronger protection.

Kahn (2007) analyses the effects of employment protection on employment and the incidence of temporary employment in various demographic groups. According to his results, more stringent regulation reduces employment among youth and immigrants relative to other groups. If employed, it is more likely that women and immigrants have temporary jobs. With a high coverage of collective bargaining, these tendencies are reinforced, which suggests that high wage floors make a downward adjustment of wages more difficult. In a related study, Kahn (2010) investigates the effects of reforms of regulations for temporary and permanent contracts in Europe since the mid-1990s. He concludes that liberalization of rules – for either type of contract – had no effect on total employment. The incidence of temporary jobs increased when it became easier to use temporary contracts, though, which suggests that employers mainly substituted temporary workers for permanent ones.

3.3 Within-country studies

Employment protection legislation tends to be changed only slowly and in small steps. Therefore, many of the reforms have been too marginal for discovering any noticeable effects. Another problem with most of the reforms from the perspective of an evaluation is that they have been designed in such a way that everyone in the labour market is affected by the reforms, which means that there are few or no suitable control groups. In a number of reforms in various countries – for example, Portugal in 1989, Italy in 1990, Germany in 1996, 1999 and 2004, and Sweden in 2001 – small companies have nevertheless been given special treatment vis-à-vis large ones. In all these cases, the legislation either became more stringent or less restrictive for small firms, while regulations for large firms in most cases remained unchanged.

In Spain, a reform was made in 1997, whereby firing costs for permanent employees were reduced only for certain demographic groups. Such partial reforms create suitable control groups, which can be assumed to be unaffected by the reforms. This makes it easier to identify the effects.

In other countries, such as the United States and Canada, regional differences in legislation have also been exploited in the research. In the United States, employers have traditionally been able to fire employees at any point in time and for any reason, according to the "employment-at-

will" principle. Over the course of time since the 1970s, most of the states have introduced various exemptions from this principle, but at different times and covering different areas of the legislation. This has resulted in regional differences in legislation.

Another advantage in studies of single countries is that the possibilities to control for country-specific conditions are greater than in those which are based on cross-country data. One disadvantage, though, is that the possibility to make generalizations which carry over to other countries can be limited due to these country-specific factors.

The analyses use disaggregate data in general – on the individual, firm or regional level. Like cross-country studies, the country-specific studies also tend to find evidence that increased stringency in employment protection legislation reduces labour market dynamics. Kugler and Pica (2006, 2008) exploit the reform in Italy in 1990. It made small firms with less than 15 employees, which had earlier been totally exempt from the regulations, pay higher firing costs than previously (though still at a lower level than larger companies). According to their results, both inflow and outflow of employment in the small firms, relative to the flows in larger firms, were reduced. Similarly, Cingano et al. (2008) find that job reallocation decreased in small firms after the 1990 reform in Italy.

Autor et al. (2007) show that job reallocation is lower in those parts of the United States which have implemented more stringent exceptions to the principle of employment at will. The analysis in Martins (2009) is an exception, where no effect on job reallocation is established. He studies a reform in Portugal in 1989, which allowed small firms with no more than 20 employees to fall under more liberal legislation regarding dismissals for personal reasons. A reform of seniority rules in Sweden in 2001 is analysed by von Below and Skogman Thoursie (2010). The reform made it possible for firms with a maximum of ten employees to exempt two persons from the seniority list when firing due to lack of work. The authors find that hirings and firings increased in small firms after the reform, but unveil no effect on net employment in general except an increase, albeit a small one, for immigrants.

A number of studies have analysed the reforms of employment protection undertaken in Germany and their effects on employment flows. Bauer et al. (2007) do not find any effect on employment flows in their study, which exploits the reforms in 1996 and 1999. Boockmann et al. (2008),

however, find clear evidence that the 1999 reform, which implied stronger employment protection in small firms, contributed to increasing job stability. They take into account the six-month waiting period before the legislation takes effect (for the individual worker) and argue that previous results for Germany that fail to do this are misleading. The 2004 reform of employment protection is examined by Bauernschuster (2009). He finds that the relaxation of dismissal protection in small firms led to a small positive effect on hirings and no effect on separations. Above all, the reform caused considerable substitution by type of employment contract. That is, firms became prone to hire workers on permanent rather than temporary contracts, in relation to the situation before the reform.

Some studies investigate the probability of involuntary separation as a consequence of higher firing costs. Givord and Maurin (2004) study how the probability of involuntary separation is influenced by reforms in legislation regarding employment protection in France. They find that this probability decreases during the more stringent regimes. Boeri and Jimeno (2005) obtain results which indicate that involuntary separation is less common in companies with more stringent employment protection in Italy and Spain. Marinescu (2009) examines a reform in Great Britain in 1999, where the tenure necessary to qualify for protection against unfair dismissal was decreased from two years to one. The probability of being fired decreased for workers with 1-2 years of tenure, relative to workers with longer tenure, mainly due to employers being more selective in their recruitment.

An important question is how employment protection influences the possibility for someone who is unemployed to find a new job compared to other groups. One hypothesis in the literature is that employers to a much higher degree are inclined to hire an employee who is already employed before someone who is unemployed if the legislation is stringent, since it is potentially more expensive to hire a "wild card". Kugler and Saint-Paul (2004) find results for the United States which indicate that unemployed individuals are disadvantaged in this respect in states with stronger employment protection. A potential negative signalling effect of becoming unemployed may, however, be mitigated by seniority rules, where tenure is the sole criterion for being fired. Kugler and Saint-Paul (2004) also find support for the idea that negative effects on job prospects

are weaker among employees who belong to a union, for whom seniority rules often apply in the United States.

A number of studies research the effects on the level of employment. Here the results are somewhat mixed: Kugler et al. (2002), Martins (2009), Sá (2008) and Schivardi and Torrini (2008) find that employment decreases under more stringent legislation; Bird and Knopf (2009) and Miles (2000) find no effect, while Autor et al. (2007) estimate positive effects. The conflicting results in these studies may be due to employment effects being different for different groups.[23] MacLeod and Nakavachara (2007), who study the effects of exceptions to the principle of employment at will in the United States, find that employment increases in jobs which require higher education and in rural areas, where mobility costs are higher than in the cities. Among those with lower levels of education, however, employment is reduced with stricter regulations. The results in Kugler and Pica (2006) indicate that employment for males increases, while it decreases for females.

Many studies explore the effects of reforms regarding temporary employment, which has been the most common kind of reform of employment protection in Europe. One of the risks of having many employees with temporary contracts is that the labour force becomes more segmented. Another risk is that unemployment to a lesser degree serves as a check on wage increases for permanent employees. Limiting the possibilities of temporary employment may lead to other problems, though, such as fewer jobs being offered to the unemployed. Bentolila and Dolado (1994) find that liberalization of regulations regarding temporary employment leads to increased wages for permanent employees in Spain, where regulations for permanent employment have been particularly strict.[24] Boeri and Garibaldi (2007) study employment effects after a regulatory reform of temporary contracts in Italy. According to their results, employment increased following the relaxation of regulation, but only temporarily. Autor (2003) finds that the increase in employment in the temporary work agency sector in the United States can largely be explained by stronger employment protection implemented by some states.

[23] The different results in some of the American studies seem to depend upon differences in estimation methods and classifications of laws (see Autor et al., 2004).

[24] They find similar results for a number of other European countries.

Studies of single countries give additional support for the idea that employment protection decreases flows in the labour market. In many of the studies for single countries, partial reforms have been exploited, which allows for a more reliable identification of employment effects than in other studies. However, there is no clear indication that the exploitation of partial reforms or the use of micro data has affected results regarding employment and unemployment in any systematic way.[25]

The number of reforms analysed is relatively small and many studies use the same reform. In addition, general equilibrium effects are ignored, that is to say, the influence on other groups than the group under study. Furthermore, non-random selection within this group can be a problem.

4. Conclusions

The empirical research reviewed in this article suggests that employment protection legislation contributes to less turnover and job reallocation. It cannot be demonstrated that aggregate employment and unemployment over the business cycle are affected to any considerable extent, but the labour market prospects of youth and other marginal groups seem to worsen as a consequence of increased stringency of the legislation. It is debatable whether marginal groups have gained much from the widespread policy strategy to liberalize regulations of temporary employment and leave regulations of regular employment intact. This policy has created incentives for employers to substitute temporary workers for permanent ones. Stronger protection of regular jobs appears to be associated with more involuntary temporary employment, particularly among the young.

Research methods and data availability have improved in many ways during the period covered. More reliable identification of effects through the exploitation of partial reforms or the use of micro data do not, however, appear to have affected the results regarding employment and unemployment in any systematic way. One important shortcoming with the micro studies is that they ignore general equilibrium effects.

[25] This conclusion is based on experiments with ordered probit regressions on around 90 regression results on employment, employment and labour force participation reported in the 15-page appendix in Skedinger (2010).

Some of the effects of employment protection legislation are clearly intended by the legislators, such as the reduced risk of being fired. Other effects are probably not specifically desired, but may be tolerated. The weakening of the position of vulnerable groups in the labour market can be seen as one of these. The more difficult question is the extent of weakening that can be regarded as acceptable. Youth tend to have a lower opportunity cost than older people of being non-employed, since, for example, continued education in general is a relatively more attractive alternative to employment. This argument carries less weight, however, for other vulnerable groups, such as immigrants and the work disabled. For these groups, unemployment is, to a much higher degree, the alternative to employment.

To what extent has employment protection legislation contributed to employment stability during the recent worldwide recession? Firm conclusions in this matter cannot yet be reached, but previous research points to some factors of importance. While jobs will typically be protected in the initial phase of a downturn, a decrease in job reallocation may be detrimental to employment growth in later phases. The magnitude of the recent crisis surpasses those experienced in most industrialized countries during the postwar period by a wide margin, so that high costs of dismissing workers may have had less of a preventive effect than previously. Another difference to past downturns is that in many countries, relatively more workers are on temporary contracts, for which there is little protection. In countries that have one-sidedly softened regulations for temporary contracts, permanent-contract workers who have lost their jobs may have to return to temporary employment to an increasing extent, which could contribute to higher unemployment (Boeri and Garibaldi, 2009). The risks for such a scenario, or that employers choose not to hire at all in response to stringent employment protection legislation, are likely to increase with widespread uncertainty about the economic recovery (Lindbeck, 1993).

There are still gaps and unresolved points in the literature which make it difficult to expound with any certainty on the aggregate welfare effects of employment protection. This is also a drawback on attempts to sketch thorough changes in the design of employment protection based on the knowledge provided by research, despite the identification of a number of positive and negative effects of employment protection. For example,

research seems to have relatively little to say about (1) how strict optimal regulations should be; and (2) according to which dimensions (seniority rules, notice periods, severance pay, etc.) the regulatory framework should be redesigned. However, a great deal of research points to risks of labour market segmentation with a large difference in stringency between regulations for permanent and temporary contracts.

Another important aspect which should be taken into account in any discussion of these results is the enforcement of employment protection legislation. For example, the implications of optional employment protection legislation have hardly been researched, neither theoretically nor empirically.

Policy proposals will also have to consider that employment protection systems do not operate in isolation, but interact with other labour market, product market and social institutions. Much of the empirical research in this field is inconclusive, partly because there is relatively little variation in the particular combinations of these institutions across countries. The existence of institutional interactions also implies that caution is warranted when considering "importing" specific employment protection designs from other countries.

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Comment on Skedinger: Employment consequences of employment protection legislation

Assar Lindbeck[*]

Per Skedinger has written a useful survey of the empirical literature on the employment consequences of legislated labour turnover costs – an area where empirical research is quite complicated and the results difficult to evaluate. To put the paper in context I will, to begin with, make a distinction between three types of labour turnover costs:

- Resource costs, such as costs associated with the search for workers, the scrutiny of applicants and training costs.
- Labour turnover costs caused by the market powers of employees with permanent job contracts, i.e. insiders on the labour market. These employees are able to create very high, indeed even prohibitive, hiring costs for firms that want to hire individuals willing to work at wages below those received by already employed workers – a basic background to the insider-outsider divide in the labour market.
- Labour turnover costs caused by legislation on employment protection, such as compulsory notification of lay-offs, rules against dismissal "without cause", severance pay, seniority regulations (such as last-in first-out rules), etc.

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Skedinger's paper is confined to the last type of labour turnover costs. This means, in fact, that he asks whether legislated labour turnover costs are so important relative to other types of labour turnover costs that they have identifiable effects on the employment situation. One difficulty of identifying such effects is that the other types of labour turnover costs may not be independent of legislated costs; different types of labour turnover costs may either be substitutes or complements to each other. There are also problems of identification, since there may be reverse causation in the sense that the employment situation may induce governments to change the rules of job protection. As in other surveys of empirical studies, there are also well-known problems of generalizing from a number of partly conflicting empirical studies; one reason is the difficulty to evaluate the relative *quality* of each of the studies.

I will organize my discussion in terms of different (although partly overlapping) *theoretical predictions* of the effects of legislated labour-turnover costs. I confine myself to five predictions.

1. Legislated labour turnover costs would be expected to result in reduced employee turnover. We would therefore expect that the flows into and out of unemployment are reduced, which would be reflected in a combination of longer average job tenure and longer average unemployment duration for individuals.

Both cross-country aggregate studies and within-country studies deal with these issues and the results are broadly consistent with the predictions. Are there any welfare implications of this result? There is probably general agreement among observers that longer unemployment duration is welfare-reducing. In contrast, it is not obvious how we should look upon longer average job tenure from a welfare point of view. Some observers may argue that it is welfare-increasing since it reflects increased job security, while others may argue that long job tenure, at least when it is the result of last-in-first-out rules, often reflects a reluctance among individuals to move to other, more suitable jobs (since they would then lose seniority).

2. *The insider-outsider divide* in the labour market would be expected to be accentuated by higher legislated labour turnover costs for workers

with permanent employment contracts (labour-market insiders). One reason is that the insiders may use their increased market powers to push up real wages, since wage formation in the real world does not take place in atomistically competitive labour markets.

Both studies based on cross-country aggregate data and studies relying on within-country data address these issues. The results are basically consistent with these hypotheses. While the job prospects for older workers tend to be boosted by such policies, the main losers are young people and probably also women and non-European immigrants. Skedinger also reports an empirical study of his own according to which stiffer job-security legislation for permanently employed workers results in an increase in "involuntary" temporary employment, in the sense that individuals who would prefer permanent contracts have to settle for temporary employment. One interpretation is that such legislation induces firms to offer more temporary job contracts at the expense of permanent job contracts – a predicted consequence that is consistent with a previous empirical study by another author. Moreover, a number of authors studying within-country data have found that reforms that make it easier for firms to hire workers on a temporary contract also tend to boost the market powers of insiders, and therefore increase the opportunity for these to push up their wages. This counteracts the direct positive employment effects of firms' increased interest in hiring workers on temporary contracts.

3. Higher labour turnover costs would be expected to reduce labour market dynamics in the sense of *less reallocation* of labour across production sectors and firms.

The results of both within-country studies and recent studies based on cross-country disaggregate data are broadly consistent with this hypothesis. While some of these studies refer to job-to-job flows, others refer to employment inflows and outflows. Some within-country studies also suggest that the effects on employment dynamics are greater for small than for large firms.

- Legislated job protection would be expected to prolong (stabilize) both high aggregate employment and high aggregate unemployment, hence to contribute to employment and unemployment persistence.

It is mainly cross-country aggregate studies that have dealt with this issue. Skedinger finds that the studies in his sample tend to be consistent with these hypotheses. He reports that "stringent legislation seems to dampen the unemployment-increasing effects in the short term in case of macroeconomic shocks, but prolongs the period required for unemployment to return to the previous level".

- Theory and intuition predict ambiguous effects on the *average level* of aggregate employment and unemployment over the business cycle, since both aggregate hiring and aggregate firing would be expected to fall.

From his survey Skedinger concludes: "It seems difficult to substantiate that there is a robust relationship between employment protection and aggregate employment or unemployment". Presumably, this characterization is based on the observation that nine of the surveyed studies based on cross-country aggregate data report adverse employment effects while seven studies report either no statistically significant effects at all or positive effects – and that studies based on disaggregate cross-country data and within-country date give similar results. However, on close inspection of the studies, we also find that while nine aggregate cross-country studies give negative effects, only two give positive effects (five studies not revealing any significant effects at all). Similarly, five within-country studies give negative effects but only one study gives positive effects (three studies reporting no significant effects at all). Only one reported study using disaggregate cross-country data deals with the issue and this study reports negative effects on aggregate employment.

Thus, as an alternative, or complement, to Skedinger's agnostic characterization of the results of the surveyed empirical studies, we may say that it is more likely that the effects on average aggregate employment are negative than that they are positive. Naturally, I then assume that the quality of the studies with negative effects is not analytically inferior to that of the other studies.

In my own writings on these issues, I have argued that it is not enough to look at the consequences of job-security legislation for *average* employment (or average unemployment) over the business cycle, or over several business cycles. I have suggested that the *social* implications of legislated job protection differ depending on the macroeconomic situation. Employment inertia (persistence) generated by high legislated job protection may be regarded as a social advantage when aggregate unemployment is initially low, as it was in European countries in the 1950s and 1960s. High employment is then stabilized. However, such inertia may be regarded as a social disadvantage if unemployment is initially high, as has been the case from the early 1980s in most countries in Western Europe, in particular if there is great uncertainty about the future macroeconomic situation (Lindbeck 1993, 1996). In this situation, it is instead high unemployment that is being stabilized. Since long-term unemployment may be regarded as a particularly serious social problem, it is reasonable to assert that the welfare costs of an increased persistence of high aggregate unemployment during a deep recession are larger than the welfare gains of the delay of the rise in aggregate unemployment in the case of unemployment-creating shocks in booms. This illustrates how an institutional feature – in this case job-security legislation – that may be favourable from a social point of view under certain circumstances may become a serious social problem under other circumstances. I have suggested that these mechanisms may help explain why the gradually more rigorous job-security legislation in Europe in the 1960s and the early 1970s was not a serious social problem, but did become a social problem after the large unemployment-creating macroeconomic shocks in the 1980s.[1]

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[1] Ljungqvist and Sargent (1998) have suggested a somewhat similar hypothesis, although they refer to microeconomic (structural) rather than macroeconomic shocks.

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Business cycle contingent unemployment insurance*

*Torben M. Andersen*** *and Michael Svarer****

Summary

The financial crisis has raised the question whether unemployment insurance schemes are sufficiently flexible. In a severe recession, there seems to be a strong argument for making the scheme more generous (higher benefit levels, longer duration), and vice versa in a boom. Building such business cycle contingencies into the unemployment benefit scheme may yield more insurance, but does this come at the cost of increased structural problems? These issues are considered in a search-matching framework capturing both the incentive and insurance aspects of unemployment benefits. It is shown that insurance and incentive effects may actually both call for counter-cyclical elements in the benefit scheme. Issues related to the implementation of such business cycle contingencies are discussed.

Key words: Unemployment benefits, business cycle, insurance, incentives.
JEL classification numbers: J6, H3.

* We thank Erik Höglin and participants in the Nordic Economic Policy Review conference on Employment Consequences of the Economic Crisis, Stockholm, 9 November 2010, for useful comments and Mark Strøm Kristoffersen for efficient research assistance.

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In response to the financial crisis and the steep increase in unemployment, calls were made to make unemployment benefit schemes more generous. Several arguments were advanced in support of this. The increase in unemployment and the perceived duration of the crisis caused hardship for unemployed for reasons beyond their control. In the quest to increase aggregate demand, it was also argued that benefit increases would target purchasing power to individuals with a high marginal propensity to consume. Such moves seem plausible to most people based on the reasoning that insurance is more important in a situation with high unemployment. According to OECD (2009), 15 member countries took steps to extend the generosity and coverage of unemployment insurance, and also other measures were taken to provide income support for job losers and low paid workers.

These changes run counter to previous concerns about the disincentive effects of generous unemployment benefits. This seems to suggest a conflict between business cycle concerns on the one hand, and structural concerns on the other. However, whether such a conflict is present depends on the extent to which such changes are made permanent, and whether they are reversed when the business cycle changes. One way of ensuring the latter is to make elements of the unemployment insurance scheme explicitly dependent on the business cycle situation. Such a business cycle contingency may potentially lead to a better balance between insurance and incentive concerns in the design of unemployment insurance schemes. Some countries like the US and Canada have explicit business cycle clauses in their unemployment insurance schemes, and proposals to introduce such contingencies were made in other countries.

Automatic stabilizers are often highlighted as an important element of fiscal policy, both because they are strong in most countries and because they are rule-based. The consensus on stabilization policy has thus stressed that fiscal policy in normal times should be left to the automatic stabilizers.[1] This strong reliance on automatic stabilizers is in some sense paradoxical since their size is not by design but rather the net outcome of policy decisions in other areas (see Andersen, 2005). The financial crisis has induced a debate on the appropriate size of automatic stabilizers and

[1] This is made explicit in the so-called Maastricht assignment for the EMU leaving centralized monetary policy to stabilize inflation, and decentralized fiscal authorities to stabilize national output by primarily relying on the automatic stabilizers.

the possibility of strengthening them (see e.g. Debrun and Kapoor, 2010). Business cycle contingencies in unemployment insurance are one way of strengthening automatic stabilizers.

The aim of this paper is to consider the case for business cycle contingencies in unemployment benefits as a way of striking a better balance between insurance and incentives in unemployment insurance schemes. Therefore, the focus is on the structural consequences of business cycle contingencies in unemployment insurance. It is inherent in the insurance argument that the value of unemployment benefits is business cycle contingent, and therefore, it is straightforward that there is an insurance argument for counter-cyclical elements in the system. The incentive effects are less clear. Is benefit generosity more distortionary when unemployment is high or low? We consider the role of the insurance and incentive effects in designing unemployment insurance schemes, and find that incentive and insurance effects are not necessarily in conflict. It is also discussed how to implement such contingencies in practice.

There is a large literature on the design of unemployment insurance schemes. Since Baily (1978) it is well known that the optimal benefit level trades off insurance and incentives. Recent work has extended these insights in various directions (for a survey see e.g. Fredriksson and Holmlund, 2006). Surprisingly, there is neither a large theoretical literature on the effects of business cycle dependent unemployment insurance nor an empirical literature exploring how the effects of various labour market policies, including the benefit level, depends on the cyclical situation.[2] A few exceptions are Moffitt (1985), Arulampalam and Stewart (1995), Jurajda and Tannery (2003), Røed and Zhang (2005) and Schmeider et al. (2010). The first three of these studies find that benefits distort incentives less in a downturn, whereas the study by Røed and Zhang (2005) does not find any differences in the effect of benefits on incentives across the business cycle. The same is true for Schmeider et al. (2010). Disentangling possible business cycle dependencies in the incentive effects is very difficult, and the main empirical challenge is to find exogenous changes in UI benefits that are uncorrelated with the job finding rate not only at one point in time, but across the business cycle. Theoretical work on business cycle contingent unemployment insurance

[2] Skedinger (2010) provides an overview of how the effect of active labour market policies depends on the business cycle situation.

schemes is also scant (see Kiley, 2003; Sanchez, 2008). However, prompted by the financial crisis, a literature is building up (see Moyen and Stähler, 2009; Andersen and Svarer, 2010 a, 2010b; and Landais et al., 2010).[3]

This paper is organized as follows: The basic issues of insurance and incentive effects of unemployment benefits and how they depend on the state of the economy are laid out in Section 1. Our findings in terms of simulations of two models based on a search-matching framework are presented in Section 2 and shed some light on the main issues involved in having business cycle contingent elements in the unemployment insurance scheme. Issues of implementation are discussed in Section 3, and Section 4 offers a few concluding remarks.

1. Unemployment insurance: Insurance vs. incentives

The rationale for unemployment benefits is to provide insurance. However, if unemployment does not only depend on the state of the labour market but also on individual behaviour like search, it follows that benefits may distort the incentives. In short, if generous benefits reduce the consequences of being unemployed, they may also reduce the incentive to search for jobs, which affects the overall employment level. Accordingly, there is a trade-off between insurance and incentives. In the following, we take the incentive effects of unemployment insurance in a search framework to be generic to the various incentive effects which can arise from unemployment benefits.

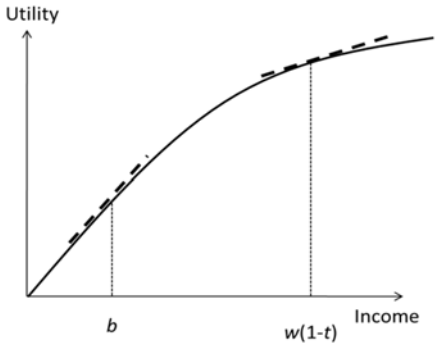
1.1 Basics

To explain the basic effects of unemployment insurance and the importance of the business cycle situation, we consider a very simple situation. Individuals are either employed, receiving a wage income w, or unemployed, receiving a benefit b. Assume that labour income is taxed at

[3] In a related study, Costain and Reiter (2005) analyse a business cycle model with exogenous search, allowing for contingencies in social security contributions levied on firms and unemployment benefits. In this model, the public budget does not need to balance in each state due to contingent assets traded with risk neutral capitalists. It is shown that it is optimal to have pro-cyclical social security contributions, while benefits are almost state invariant.

the rate *t* to finance the unemployment benefit scheme, and that benefits are non-taxable income. Utility depends on consumption possibilities and thus income according to a standard utility function $V(.)$ where $V'(.)>0,\ V''(.)<0$, implying that agents are risk averse. The utility when employed is thus $V\left(w(1-t)\right)$ and when unemployed $V(b)$ as depicted in Figure 1.

Figure 1. Utility and marginal utility for employed and unemployed



For workers to have an incentive to work, it is required that $w(1-t)\geq b$ (the participation constraint). When the income as unemployed *b* is lower than the income as employed $w(1-t)$, it follows that the marginal utility of income for the unemployed is larger than the marginal utility of income for the employed, cf. Figure 1.

Suppose first that the unemployment rate is exogenously driven by macro conditions. A policy maker aiming at maximizing total utility (a utilitarian policy maker) received by the employed and unemployed can in this situation increase overall utility, which is $(1-u)V\left(w(1-t)\right)+uV(b)$ by increasing the benefit level as long as $V'\left(w(1-t)\right)<V'(b)$. Redistributing consumption from the employed to the unemployed increases total utility as long as the employed have a lower marginal utility from income than the unemployed. In this case, the optimal benefit level is determined by the condition

$$V'(b)=V\left(w(1-t)\right), \tag{1}$$

which equalizes the marginal utility of employed and unemployed. This is known as the condition for full insurance (the Borch condition).

The above condition refers to the distribution of risk between employed and unemployed at a given point in time. However, the scope for such risk diversification is restricted. To see this, note that when the tax on the employed finances the unemployment benefits, the budget constraint for the scheme reads

$$tw(1-u) = bu$$

or

$$t = \frac{b}{w}\frac{u}{(1-u)}, \tag{2}$$

where u is the unemployment rate. This implies that the tax rate is increasing in the replacement rate b/w and the unemployment rate. Taking the benefit level and thus the replacement rate as given, it follows that higher unemployment causes a higher tax rate which, in turn, reduces the disposable income of the employed. The marginal utility of the employed therefore increases, and to rebalance marginal utilities to satisfy the Borch condition (1) the benefit level has to be reduced. Full insurance under a balanced budget condition thus implies that the benefit level should move pro-cyclically, that is the benefit level is high when the unemployment rate is low and vice versa (Andersen and Svarer, 2010a).

This emphasizes the role of the public budget in absorbing and diversifying shocks. If the budget does not have to balance in each single state of nature but only across states of nature,[4] risk diversification is possible not only between the employed and unemployed at a given point in time, but also across points in time. The insurance properties of unemployment benefits are thus intimately related to the automatic budget reactions or stabilizers. It is via the budget response that it is possible to expand the scope for risk diversification via counter-cyclical elements in unemployment insurance. We return to this issue below.

The above reasoning was based on the unrealistic assumption that the unemployment rate is exogenous, thereby disregarding possible incentive

[4] More precisely, the scheme should satisfy the intertemporal budget constraint.

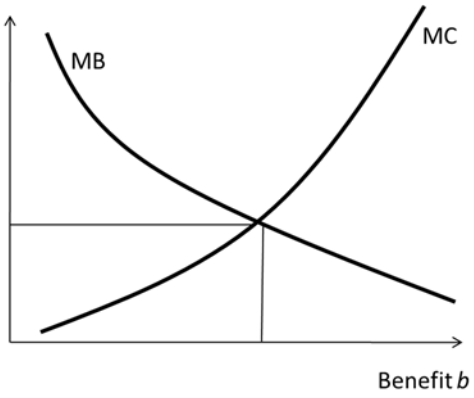
effects of unemployment benefits. To capture the latter, consider a standard search setting where job finding rates also depend on individual job search effort. Allowing for such incentive effects considerably complicates the question. A higher benefit level may, via its effect on individual incentives, lead to less job search and thus a higher unemployment rate.[5] Unemployment thus depends on the state of the economy (macro) and individual search (incentives). Solving for the benefit level by maximizing total utility (when the tax rate is determined by the budget constraint) yields the first-order condition

$$u(b)\left[V'(b)-V'\left(w(1-t)\right)\right]=\frac{\partial u(b)}{\partial b}\left[V\left(w(1-t)\right)V(b)\right]. \tag{3}$$

This condition has a straightforward interpretation in terms of the insurance and incentive effects of unemployment benefits. The LHS gives the marginal social gain from insurance, as the difference in marginal utilities between unemployed and employed from raising the benefit level $V'(b)-V'\left(w(1-t)\right)$ times the number of unemployed $u(b)$ affected by such a change. The RHS gives the marginal cost as the effect of benefits on unemployment $\partial u(b)/\partial b$ multiplied by the utility loss from driving more people into unemployment $V\left(w(1-t)-V(b)\right)$. Hence, the optimal benefit level is determined where the marginal cost equals the marginal gain, cf. Figure 2.

[5] More generally, there may be effects via wage setting etc.

Figure 2. Determination of the optimal benefit level



The optimal benefit level does not imply full insurance in the sense of equalizing marginal utilities. The optimal benefit level implies that the marginal utility of income to the unemployed is larger than the marginal utility of income to the employed

$$V'(b) > V'\big(w(1-t)\big) \text{ for } \frac{\partial u(b)}{\partial b} > 0.$$

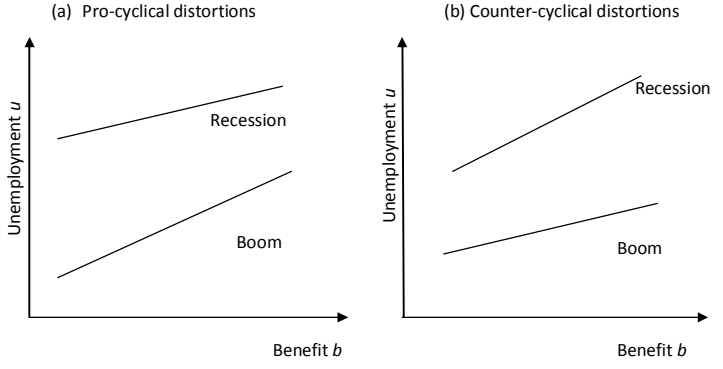
The intuition is that it is too costly in terms of unemployment to provide full insurance.

1.2 Business cycle dependent benefit levels

The interesting question is whether and how the benefit level should respond to a higher unemployment rate. From the LHS of (3), it is immediate that a higher unemployment rate increases the marginal gain from providing benefits. This is just another way of phrasing the fact that with higher unemployment, more would gain from a higher benefit level, and this would tend to increase overall welfare. How is the marginal cost affected? In general the effect is ambiguous – benefits may be more or less distortionary when unemployment is higher.

The ambiguous effect on distortions is illustrated in Figure 3 in the stylized case with two states of the world – booms and recessions – summarized by unemployment being lower in one than in the other. The figure asks what are the consequences of the benefit level for unemployment in a given state of nature. This is captured by the slope of the line, showing by how much unemployment increases when the benefit level is increased.[6] The situation characterized in panel (a) has unemployment to be more sensitive (higher slope) to the benefit level in a boom as compared to a recession. The distortion is pro-cyclical. In panel (b) unemployment is more sensitive to the benefit level in a recession than in a boom, i.e. the distortion is counter-cyclical. The case with a pro-cyclical distortion is à priori the most intuitive; incentives matter most when unemployment is low. If this is the case, it follows that a policy which increases benefits by x per cent in a recession and decreases it by x per cent in a boom would lead to a decrease in overall (average) unemployment. This shifts benefits away from situations where they are more distortive to situations where they are less distortive. This suggests that counter-cyclical benefits can have a beneficial structural effect.

Figure 3. Unemployment effects of benefits



Kiley (2003) and Sanchez (2008) assume that benefits distort less in a recession than in a boom (corresponding to Figure 3.a) and consider benefit schemes delivering given utility levels for the unemployed. They find

[6] In most models, it is the elasticity of unemployment with respect to benefits which is the crucial variable but, for simplicity, we present it here in terms of the slope.

that the benefit level should be higher and decline less sharply with duration in a recession than in a boom.[7]

This leaves us with the important question whether the distortions of incentives are larger in a boom than in a recession. As noted in the introduction, there is not much empirical work to guide us on this question. Therefore, it is of interest to analyse what standard labour market models imply.

Addressing this question in a search-theoretic framework reveals that this critically depends on how search is affected by the business cycle situation (Andersen and Svarer, 2010b). If unemployed search less in a recession than in a boom, then the distortion is counter-cyclical, corresponding to panel (b) in Figure 3. If unemployed search more in a recession than in a boom, the distortion is pro-cyclical, which corresponds to Figure 3, panel (a).

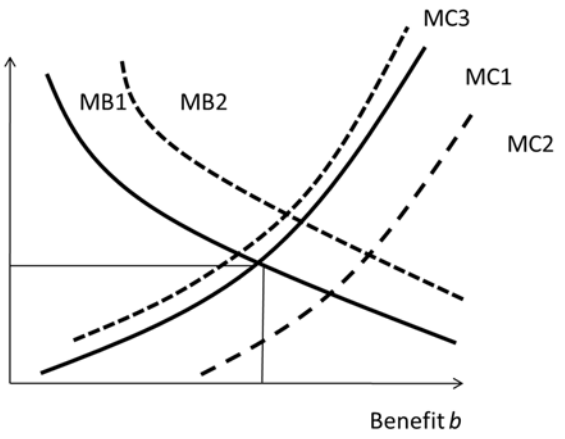
Approaching this issue by comparing equilibria under the assumption that a given situation persists (no business cycle fluctuations), it is possible to show that the standard search model implies that search is pro-cyclical, i.e. that unemployed search more in a boom than in a recession. However, this result changes when explicitly allowing for changes in the business cycle situation (Andersen and Svarer, 2010b). If the business cycle situation can change from a recession to a boom or vice versa with some probability, search patterns are qualitatively affected. The reward for searching in a recession is now higher since on top of the immediate gain from finding a job, there is the additional gain that the economy may shift to a boom, making it more likely that the job is maintained. The opposite holds in a boom. Explicitly allowing for changes in the state of nature also makes it possible to model insurance via the public budget in an explicit general-equilibrium framework, implying that deficits created in certain periods are financed in other periods so as to imply sustainable public finances (below we report some results from this framework). As will be shown below, a two-tier unemployment benefit scheme may also display pro-cyclical distortions.

It is important to distinguish between insurance and stabilization, and although business cycle contingent unemployment insurance may strengthen automatic budget responses, this does not necessarily imply that employment is stabilized. Assume for the sake of argument that ben-

[7] The financing constraint is disregarded.

efit levels are made counter-cyclical, i.e. higher (lower) when unemployment is high (low). Since benefits are distortionary, this tends to lower unemployment further in a recession and increase it further in a boom as compared to state-independent benefits. Business cycle contingent benefits may thus accomplish more insurance, but employment may display more volatility. However, if distortions are counter-cyclical, it can be shown that the average unemployment rate is reduced, and therefore structural unemployment is lowered (see Andersen and Svarer, 2010a,b). This is interesting since it shows that improved insurance does not necessarily come at a structural cost.

Figure 4. Determination of optimal benefits – effect of a recession



Returning to the question of how optimal benefits may depend on the business cycle situation, we are left with a situation as illustrated in Figure 4. A downturn increases the marginal gain from benefits since unemployment is higher, but may either increase or decrease the marginal cost.[8] In the case where the marginal cost goes down (pro-cyclical distortions), the case is simple. Benefits should be counter-cyclical. If there is

[8] There is also an issue whether distortions are weighted more or less in a recession. In the basic search model, it is ambiguous whether the gain from having a job is higher in a boom or in a recession. While intuitively it is better to have a job in a recession since it is difficult to find a new job, this is countered by the fact that a job can easily be lost due to high job separations. The opposite holds in a boom.

an increase in the marginal cost of providing benefits (counter-cyclical distortions), the outcome is ambiguous, although it is possible that the optimal benefit level still increases if the shift in marginal benefits dominates the shift in marginal costs.

2. An analysis of business cycle dependent unemployment insurance schemes

To shed some more light on the issue of whether elements of the unemployment insurance scheme should be pro-, counter- or a-cyclical, this section turns to simulations of models based on a search-matching framework (see e.g. Mortensen and Pissarides, 1994; and Pissarides, 2000). Individuals can be employed or they can be unemployed in which case they search for jobs. Firms post vacancies, and frictions imply that matches between firms with vacancies and unemployed are imperfect, meaning that vacancies and unemployment coexist.

Flows between the different labour market situations can arise due to changes in exogenous variables such as the job separation rate, vacancy costs, and productivity. In the following we focus on changes in the job separation rate.[9] The results are robust to changes in other parameters. A recession is generated by increasing the job separation rate and a boom by reducing the job separation rate. The model does not address job-to-job transition, implying that job separation is associated with an unemployment spell (of stochastic duration). To simplify, we assume that the wage is constant over the business cycle.

We present two model variants, one featuring a two-tier social safety net, and one explicitly modelling business cycle fluctuations. In both cases we focus on the implications of business cycle policies for incentives and insurance.

[9] There has been some debate on the extent to which changes in the job separation rate are a driver of unemployment fluctuations, especially in the US (see Shimer, 2005). Elsby et al. (2008) find that the US is an outlier compared to other OECD countries where fluctuations in both inflow and outflow rates are found to be important.

2.1 Two-tier social safety net[10]

Two important dimensions of the unemployment insurance scheme are the benefit level and its duration. In most countries there is a transition from unemployment benefits to some lower transfer (social assistance) after some point of time; i.e. a two-tier social safety net. The main question is what can be accomplished by making either the benefit level or its duration dependent on the business cycle situation. We consider the two dimensions separately to compare their separate implications.

The business cycle contingent policies are generated from the constraint that the overall utility (expected present value) from unemployment should be invariant across business cycle situations (see the Appendix for technical details). This criterion is often raised in the public debate, but other criteria could, of course, be used (see e.g. Andersen and Svarer, 2010a).

In the following, we compare a business cycle dependent UI system to a business cycle independent system. We allow for changes in the exogeneous job separation rate (layoff rate) to generate business cycle variations and depict how the optimal unemployment insurance scheme reacts to these changes. Then, we highlight the effect on key labour market variables. The results are presented such that an index 100 corresponds to a normal business cycle situation, an index below 100 is a recession, and an index above 100 is a boom. The tax rate is assumed to be constant at a level that balances the budget across the possible states of nature.

A business cycle contingent policy keeping the utility of unemployed invariant across business cycle situations implies that either the benefit level or benefit duration is moving counter-cyclically, cf. Figure 5, in contrast to a business cycle independent scheme where they are both invariant to the business cycle situation.

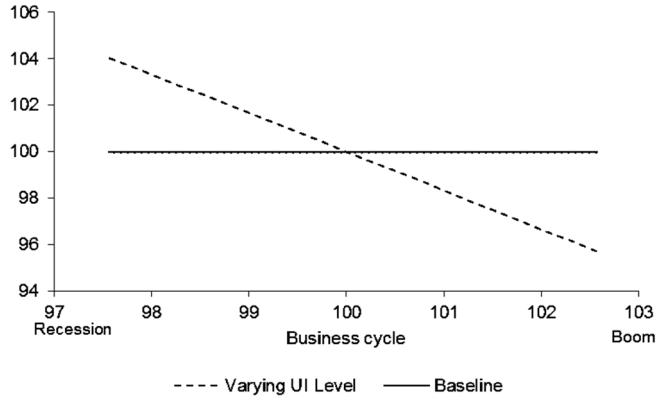
The generosity of the UI system affects search behaviour. This is shown in Figure 6. A business cycle dependent scheme makes the unemployed search less in a recession and more in a boom, as compared to the business cycle independent scheme. For unemployed on social assistance, the opposite is the case. This is due to an entitlement effect. By obtaining employment, the social assistance recipients gain the right to unemployment benefits if they become unemployed later on. Since benefits are

[10] The model structure is briefly described in the Appendix. See also Andersen and Svarer (2009).

higher in recessions, their search intensity is positively affected by the more generous UI system in recessions. In booms the opposite effect lowers search compared to a system with time invariant benefits.

Figure 5. Business cycle dependent UI benefits

Level of UI benefits



Duration of UI benefits

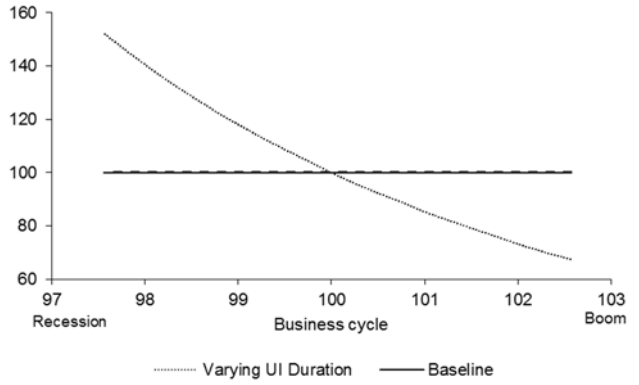
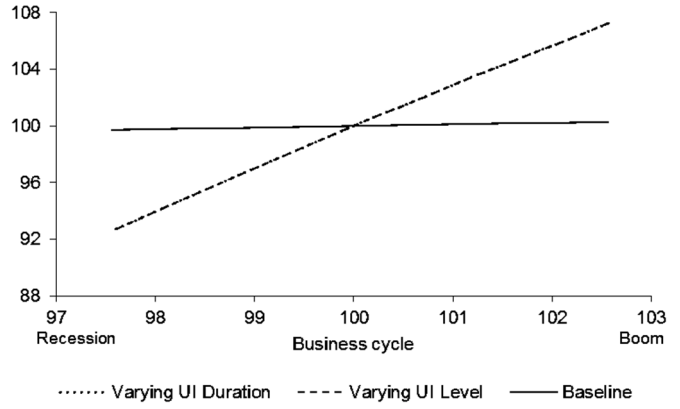
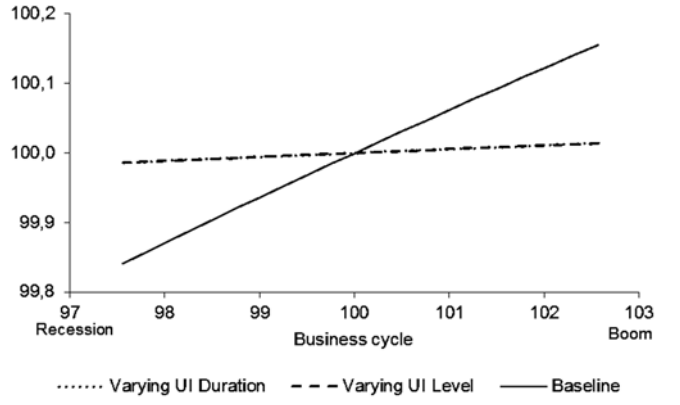


Figure 6. Search intensities

Job search for UI recipients



Job search for social assistance recipients

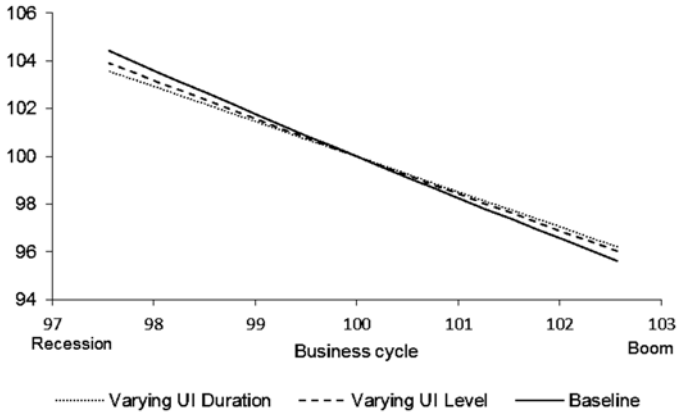


Note: The lines for varying UI duration and UI level coincide in the two figures.

The total search activity in the labour market is shown in Figure 7, and it is found by weighting the search intensities in Figure 6 by the size of the two groups of unemployed (given in Figure 9). First, note that total search is counter-cyclical, although it is pro-cyclical for the two groups. The reason is that the level of search for social assistance recipients is larger than that of unemployed, and there is relatively more of the former

group in a recession. Making the unemployment insurance scheme business cycle contingent weakens the counter-cyclicality of total search. However, for the simulation shown here, the net difference between business cycle dependent and independent elements in unemployment insurance is marginal. The counter-cyclical pattern for search arising under a two-tier scheme is interesting since the opposite holds in the one-tier case (as discussed in Section 1), and counter-cyclical search is the key to making distortions pro-cyclical.

Figure 7. Total job search

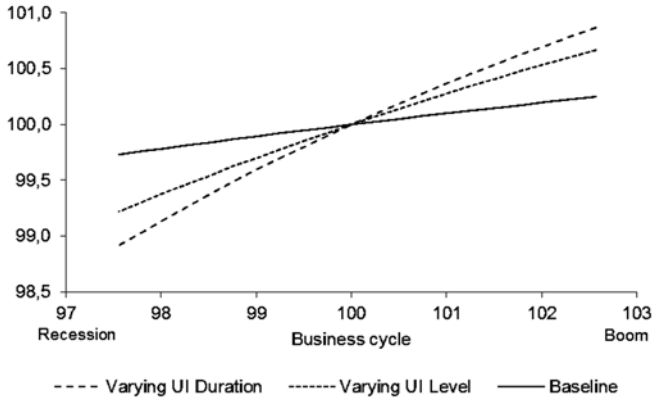


Vacancies are affected by search via its effect on job filling rates. The number of vacancies is pro-cyclical, cf. Figure 8, and more so with a business cycle contingent scheme due to the response of total search discussed above. The reduction in search induced by a business cycle dependent UI system implies that it takes relatively longer to fill a vacancy in bad times and hence, firms are reluctant to post new vacancies. In sum, job creation is relatively lower in the business cycle dependent system as compared to the time invariant system in recessions and vice versa in booms.

The number of people receiving unemployment benefits and social assistance is clearly counter-cyclical, cf. Figure 9. A business cycle contingent system reinforces this effect for the unemployed, particularly when benefit duration is business cycle contingent. The response of the number of social assistance recipients is different. While cyclical dependent bene-

fit levels strengthen the counter-cyclical pattern, a cyclical dependent benefit duration produces a pro-cyclical path. The reason is that with a longer (shorter) benefit duration in a recession (boom), the transition from benefits to social assistance will be smaller (larger).

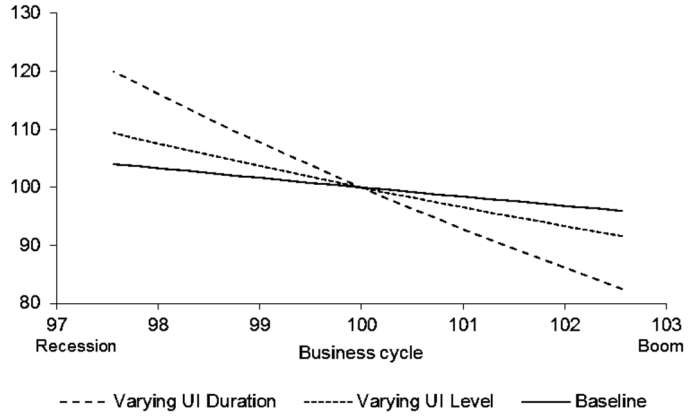
Figure 8. Vacancies



Under the two-tier scheme, the gross unemployment rate is given by the total number of benefit and social assistance recipients. Naturally, gross unemployment moves counter-cyclically, as shown in Figure 10. However, under a business cycle dependent scheme, this counter-cyclical pattern is strengthened or, to put it differently, gross unemployment becomes more sensitive to the business cycle situation. The reason is straightforward, since making the unemployment system more generous in a state of nature where unemployment is high tends to worsen unemployment, and vice versa. The counter-cyclical pattern of the generosity of the unemployment insurance scheme is reflected in a stronger sensitivity of the budget position to the business cycle position, i.e. the automatic budget reaction is strengthened, cf. Figure 11. This brings out the point that there is a difference between providing more insurance and stabilizing employment (gross unemployment). This is also apparent when considering the response of overall utility for employed, benefit recipients and social assistance recipients, cf. Figure 12 (the overall utility is defined in the Appendix.).

Figure 9. Number of benefit recipients – UI and SA

Number of UI recipients



Number of social assistance recipients

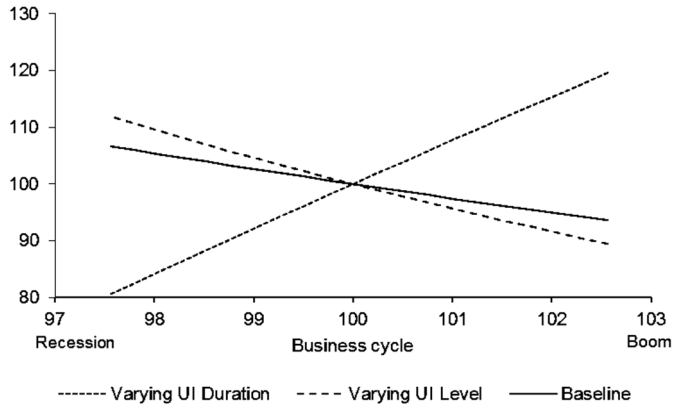


Figure 10. Total number of benefit recipients

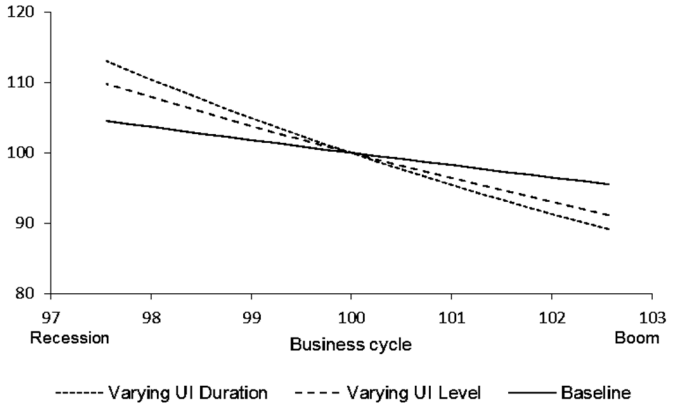
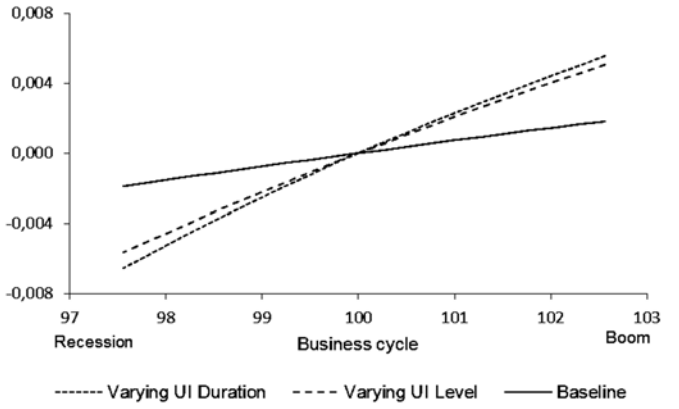


Figure 11. Public budget

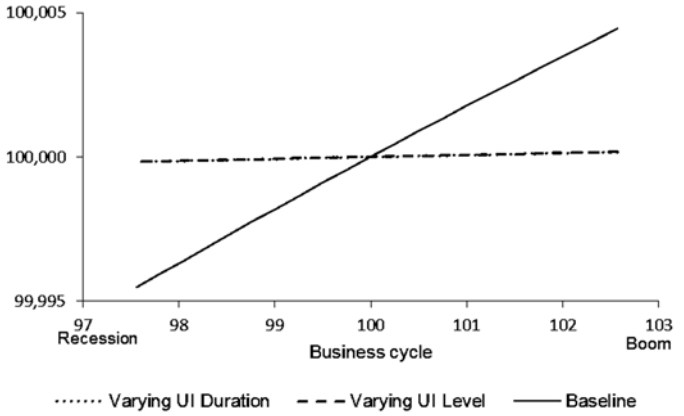


The finding that the utility of the unemployed receiving unemployment benefits is stabilized is no surprise. This merely reflects the policy criterion on which the business cycle policies were designed. It is a key property of the search-matching model that there are continuous flows between the different labour market situations (employment, benefits, and social assistance). That is, unemployed have a chance of moving to employment, and a risk of exhausting their UI benefits and move to social assistance. Likewise, individuals who are currently employed risk a job

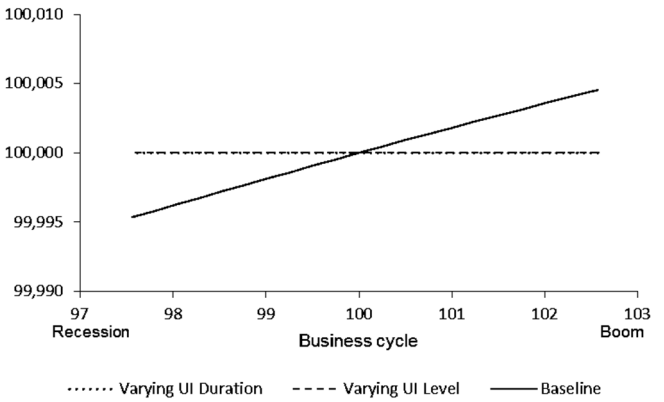
separation, and recipients of social assistance may find a job. As a consequence, the overall utility for the individuals in the three states is closely connected, and the interesting finding is that the business cycle contingent system tends to stabilize utility in all possible labour market positions, thereby strengthening insurance.

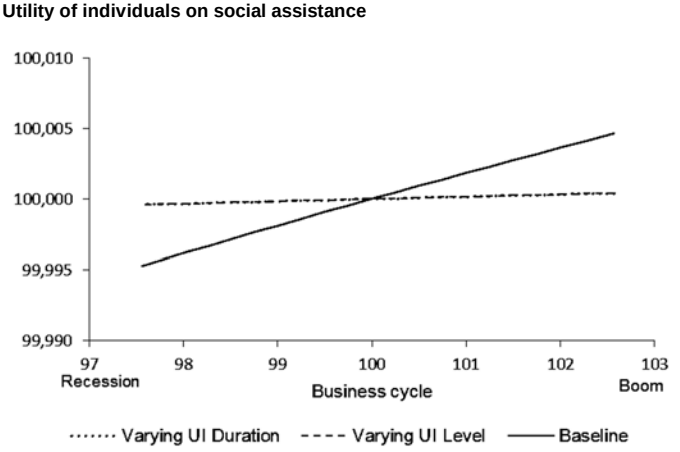
Figure 12. Utility flows

Utility of employed individuals



Utility of individuals on unemployment insurance



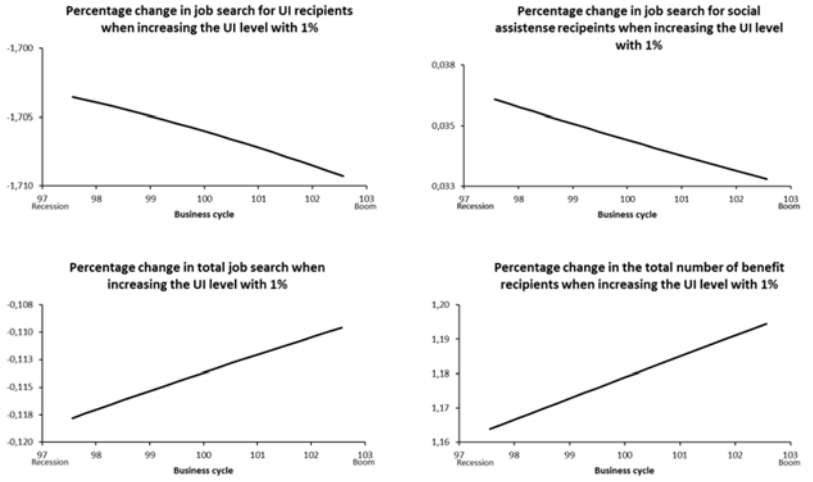


The structural implications of a business cycle dependent scheme depend on how distortions are affected by the business cycle situation. In particular, if distortions move pro-cyclically, this strengthens the argument for counter-cyclical elements in the unemployment insurance system. To take a closer look at this, we simulate the effects of a one percentage point increase in the benefit level for the various business cycle situations. The effects are depicted in Figure 13.

In interpreting this figure, first note that a higher benefit level makes unemployed search less and social assistance recipients search more (cf. also Figure 6). However, for both groups the effect of benefits on search is stronger in a recession than in a boom. The response of the social assistance recipients may seem paradoxical, but the explanation is that during a recession, job duration is shorter and the transition into unemployment benefits higher. If benefits are made counter-cyclical, it gives social assistance recipients a strong incentive to search for jobs (the consequence of losing a job again is smaller). Considering the net effect of these on total search (lower left panel), we find that it is negative and that a one percentage increase in the benefit level lowers search more in a recession than in a boom. However, considering the gross unemployment rate, we find that it increases more in a boom than in a recession; that is, measuring the distortion in terms of its effect on gross unemployment, it is pro-cyclical. Finally, while distortions are dependent on the business

cycle situation, the present simulation suggests that the effect is relatively small.

Figure 13. Effect on search of an increase in the benefit rate



3.2 Business cycle dependent UI benefits in a model with business cycle variations

The results presented in the previous section are based on a model that does not describe the transition between business cycle states. More specifically, this implies that the individuals – in any given state – take the macro situation to be invariant. This is somewhat unsatisfactory since the possibility that the economic situation might change is the essence of business cycle fluctuations. The downside of extending the model to allow for business cycle changes is that it loses tractability. In this section, we will focus solely on the effects of a change in the UI benefit rate. Individuals are either employed or unemployed and receiving UI benefits.

The framework remains a search-matching model, but the possible changes between booms (low level of job separations) and recessions (high level of job separations) are explicitly taken into account (see Andersen and Svarer, 2010b for details). Business cycle fluctuations are characterized by the difference between a boom and a recession and the probability that the economy changes state. The probability that the econ-

omy changes state is described by π. $1-\pi$ is the probability that the economy stays in the current state. The parameter π can be interpreted as the persistence of the economy. In empirical analysis, π is typically estimated to lie in the range from 0.7 to 0.9 (see e.g. Hamilton, 1994).

The possibility of shifts in the economy affects both the need for insurance and behaviour. For example, a transition from a boom to a recession implies more unemployment and thus an increased risk of becoming unemployed. Search is also affected by business cycle changes since the return to search does not only depend on the current state of the economy but also on the future state of the economy. An important finding is that the possible shift in the business cycle situation strengthens search in a recession and weakens it in a boom. The reason is that getting a job in a recession is now more valuable since there may be a shift to a boom with a lower job separation risk, and vice versa. This tends to make search move counter-cyclically which, in turn, causes the distortion to be pro-cyclical.

The cyclical dependence of distortions can be analysed by considering the response of search and unemployed to changes in benefit levels under various business cycle situations. Tables 1 and 2 give the elasticity of search and unemployment, respectively, when we raise benefits by one per cent in both a boom and a recession.

Table 1. Effects of changing benefits: elasticity of search w.r.t. benefit level

	$\pi = 0.7$		$\pi = 0.9$	
	$b_{recession}$	b_{boom}	$b_{recession}$	b_{boom}
Elasticity of search, recession: $s_{recession}$	1.58	0.87	1.87	0.33
Elasticity of search, boom: s_{boom}	0.90	1.69	0.34	1.92

As expected, search decreases as a result of increased benefits. There is a direct effect on search of the current state of the economy, but also an indirect effect on search if the state of the economy changes. Both the direct and the indirect effect of increasing benefits are larger in booms than they are in recessions. As a result, distortions are business cycle dependent and higher in booms than in recessions. This is reflected in the response of unemployment to changes in benefit levels in different labour market situations, cf. Table 2. A benefit increase leads to a larger unemployment increase in a boom than in a recession. It is seen that distortions are larger when the business cycle is more persistent, and the pro-cyclical

pattern for distortions is somewhat stronger with a lower persistence, but the effect is not large.

Table 2. Effects of changing benefits: elasticity of unemployment w.r.t. benefit level

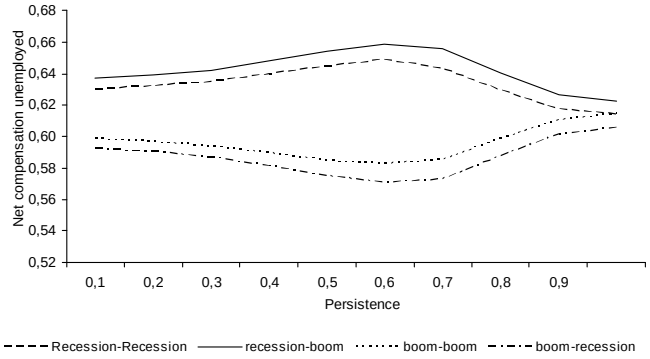
	$\pi = 0.7$		$\pi = 0.9$	
	$b_{recession}$	b_{boom}	$b_{recession}$	b_{boom}
Elasticity of unemployment, recession: $u_{recession}$	1.47	0.83	1.72	0.35
Elasticity of unemployment, boom: u_{boom}	0.88	1.61	0.36	1.79
Elasticity of mean unemployment u	1.20	1.18	1.07	1.04

In the present model, there are four possible states determined by the business cycle situation in the past period and in the current period. In the following, the first label refers to the current state and the last to the past state. Hence, boom-boom means that the economy is currently in a boom and that in the previous period the state of the economy was also booming. To find the optimal level of UI in the four states, we take a utilitarian perspective and maximize the sum of the values of the utility for the employed and the unemployed weighted by the numbers of employed and unemployed. In Figure 14 we depict the benefit level that maximizes this criterion.

As seen in the figure, the optimal UI benefit system gives more benefits when the economy is in a recession than in a boom. Moreover, the business cycle dependence is strongest when the cycle is neither weakly nor strongly persistent.

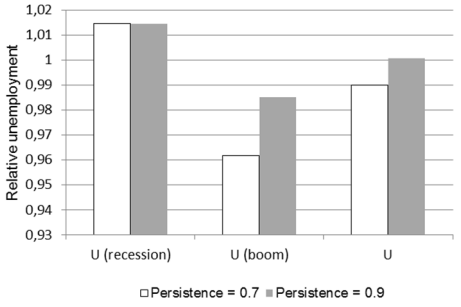
In the present model, unemployment alternates between two levels (boom and recession). Compared to a system with business cycle invariant benefits, there will be more unemployment in recessions with a business cycle dependent system, and vice versa in booms. In Figure 15, we show how the unemployment level differs between a business cycle dependent system and an independent one.

Figure 14. Optimal UI benefits in a model with business cycle fluctuations



Note: The net compensation is given as $b_i - T_{ij}$. The increase in the benefit level in the bad state is assumed to equal the decrease in the good state.

Figure 15. Relative unemployment: constant vs. business cycle dependent benefits



Note: The figure shows the unemployment with business cycle dependent benefits relative to the level of unemployment in a model with business cycle independent benefits. The level of unemployment in the latter model is normalized to 1.

The level of unemployment is on average lower when persistence in the business cycle is moderate (0.7) and almost the same when persistence is strong (0.9), cf. Figure 15. All in all, this suggests that it is possible to design a business cycle dependent UI benefits system that increases the utility of the population without causing more structural unemployment.

3. Implementation

The preceding analysis has given arguments for having counter-cyclical elements in the unemployment insurance scheme. However, the models considered are highly stylized and leave it open how to implement such contingencies. The following discusses some issues involved in introducing business cycle dependencies in the unemployment insurance system.

Although business cycle dependencies in the unemployment insurance scheme strengthen automatic budget effects (automatic stabilizers), there is an important difference between such contingencies and the main drivers of automatic stabilizers. The latter arises as a result of the micro structure in taxation schemes and the social safety net. If tax payments are dependent on current activity (consumption and income) and entitlements depend on the individual situation (unemployment), it follows that e.g. a recession automatically leads to lower revenue and higher expenditure. These automatic responses are part of the virtues of the rule-based automatic stabilizers as the responses arise without any information and decision lags. A business cycle contingency in the unemployment insurance scheme is qualitatively different since the trigger is the aggregate situation of the economy. Such contingencies thus require a trigger defined in terms of macro variables (e.g. unemployment), which implies that there is both an information lag (collecting information on the trigger variable) and a problem with respect to how well it measures the underlying situation of the economy. Still the scheme can be rule-based, which is important in order to eliminate decision lags and avoid time-inconsistency problems (it is easier to agree on extensions than contractions).

The US system stipulates rules for extending benefit duration depending on the unemployment rate in the state in question, cf. Committee on Ways and Means (2004). Normal benefit duration is 26 weeks, but extension is possible according to two different models: (A) The benefit period can be extended by 13 weeks provided that (i) the unemployment rate is at least five per cent for insured unemployed over the preceding 13 week period, and that this level constitutes at least 120 per cent of the unemployment rate over the last two years for the same 13 weeks of the year, or (ii) the unemployment rate for the last 13 weeks has exceeded six per cent. (B) The trigger variable is the average of the seasonally adjusted unemployment rate over the last three months. If this exceeds 6.5 per cent

and constitutes at least 110 per cent of the same measure over the last two years, the state can extend benefit duration by 13 weeks. If the unemployment rate exceeds 8.5 per cent and if this is more than 110 per cent of the unemployment rate over the last two years, it is possible to extend benefit duration by an additional 20 weeks. While model A applies to all states, it is up to each state whether they want to adopt model B. In addition, discretionary changes in benefit duration have taken place (see Kiley, 2003), for example, as a response to the financial crisis.

The Canadian scheme is probably the most sophisticated since it is entirely rule-based and operates with business cycle contingencies in three dimensions (eligibility, level, and duration). The trigger in the scheme is the regional (13 regions) unemployment rate, which determines eligibility for benefits, the duration of the benefit period, and the benefit level. These contingencies are tabulated and thus transparent to all (see http://www.hrsdc.gc.ca/eng/ei/menu/eihome.shtml). Unemployed can receive unemployment insurance from 19 weeks up to a maximum of 50 weeks, depending on the local unemployment rate.

Other examples of explicit business cycle contingencies are the buffer fund established in Finland in connection with entry into the EMU. The idea is to make contributions to unemployment insurance business cycle dependent and thus allowing risk diversification via the accumulated buffer fund. In Sweden, there has been a tradition of adapting active labour market policies to the business cycle situation. Although these changes relied on discretionary changes, their regularity implied that they were termed the semi-automatic stabilizers.[11]

However, the key parameters of unemployment schemes are business cycle independent in most countries, and there is an issue of how to implement such contingencies. We discuss this with the outset in a recent proposal made for Denmark. Proposals for such a scheme have also been made in Sweden (Swedish Fiscal Policy Council, 2009).

[11] See e.g. Finansdepartement (2005, bilaga 2,) which assesses the automatic budget reaction to be between 0.65 and 0.9 per cent of GDP depending on whether the semi-automatic responses via labour market policies are included.

3.1 Some thoughts on redesigning the Danish system

The unemployment insurance scheme in Denmark is a two-tier scheme like the one modelled in Section 2.1. Membership of the unemployment insurance scheme is voluntary and contribution-based, but with public subsidies. The benefit constitutes a maximum of 90 per cent of past income or a cap, implying that the average replacement rate is about 65 per cent. Benefit duration is four years (as of July 2010 reduced to two years), and various activation requirements are associated with eligibility. Social assistance (means-tested on a family basis) is available when benefit duration expires.

In 2009, a labour market commission proposed the introduction of business cycle contingencies in the unemployment scheme by making benefit duration dependent on the business cycle situation. We describe the suggestion in the following.[12]

- *Automatic*: Changes must be automatic and not based on discretionary actions. Instead, there should be a clear rule with well-defined triggers for when to extend benefit duration. This secures a transparent system that is less vulnerable to changing political preferences.
- *Trigger*: The indicator which determines shifts in the benefit period must reflect the business cycle situation accurately and timely to capture shifting business cycles. The indicator should be based on publicly available statistical information.
- *Duration*: The benefit extensions should be of a fixed duration. This prevents an extension given in recessions from overlapping with the next boom period.
- *Population*: Benefit extensions should only be given to individuals who risk losing their benefits in the near future and who face an immediate need for insurance.

The proposal outlined below was given when the benefit period was four years. Based on the four principles outlined above, the proposal was as follows:

[12] Both authors were involved in this work; Michael Svarer as member of the commission and Torben M. Andersen as consultant for the commission on the effects of business cycle dependent labour market policies.

Table 3. Business cycle dependent benefit period

Criteria for benefit period extensions	
Gross unemployment	**Benefit period**
- Below 7%	2 years for all
- Between 7% and 9%	The period is extended to 2½ years for unemployed who have received benefits for more than 1 year and 9 months
- Above 9%	The period is extended from 2½ years to 3 years for unemployed who have received benefits for more than 2 years and 3 months.

Note: Gross unemployment equals unemployed receiving unemployment benefits or social assistance plus people in active labour market programmes.

The gross unemployment rate was chosen as the business cycle trigger. The gross unemployment rate is an official unemployment rate provided by Statistics Denmark. It combines individuals who are unemployed and covered by unemployment insurance with individuals without a job who are participating in active labour market programmes. It is thus a reliable indicator on the state of the labour market.

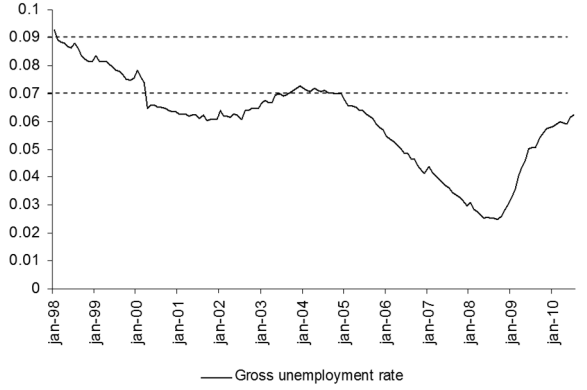
It may be argued that the trigger should be defined in terms of the structural unemployment rate,[13] so as to distinguish structural and cyclical changes in unemployment. The assessment of the structural unemployment rate is, however, associated with several problems. Most evaluations of the structural unemployment rate tend to track the actual unemployment rate, and the information content is thus open to discussion. The gross unemployment rate is not necessarily the most accurate measure of the business cycle situation. It is well known that employment lags changes in production. However, this measure has the advantage that it is frequently updated and that it reflects the situation for the unemployed. Moreover, the data quality of the measure is highly reliable.

The threshold levels are chosen to reflect historical periods with medium to high unemployment. They are not calibrated from an advanced economic model, and further work might suggest other thresholds. The development in the gross unemployment rate in Denmark for the last

[13] For example, the trigger level could be defined as the structural unemployment rate plus some margin, say 2 or 3 per cent.

decade is shown in Figure 16. The proposed system would have led to a couple of benefit extensions in this period.

Figure 16. Gross unemployment rate and level for benefit extensions



Source: Ministry of Labour.

4. Concluding remarks

There is an obvious insurance argument for having counter-cyclical elements in the unemployment insurance scheme such that it is more generous in situations with high unemployment and vice versa. Neither empirical nor theoretical work leaves a clear-cut answer to whether such a scheme would affect incentives in an adverse way. In the present paper, a search-matching framework has been used to address this issue, and there are some theoretical arguments why the distortions caused by unemployment insurance are stronger in a boom than in a recession. This implies that both insurance and the incentive argument support counter-cyclical elements in unemployment insurance. However, the models simulated in this paper indicate that the cyclical dependence of distortions is rather weak. One way of interpreting this is by considering that it is possible to achieve improvements in insurance via cyclical contingencies at small (and possibly negative) structural costs.

In the preceding discussion, aggregate demand effects have been disregarded. Hence, although counter-cyclical elements in unemployment insurance tend to strengthen the automatic budget response, it is an impli-

cation that unemployment comes to display more variability. This is driven by the supply side effect of increasing benefit generosity when unemployment is high, and vice versa. It is important for future research to introduce aggregate demand effects alongside the supply-side effects to work out the implications of business cycle contingencies for aggregate stability. We conjecture that the aggregate demand effect under plausible assumptions will dominate.

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Appendix

The following gives the main structure of the model underlying the simulations in Section 2.1 (for further details, see Andersen and Svarer, 2009). Individuals can be in one of three situations: employed (*E*), unemployed (*U*) receiving unemployment benefits (*b*), or unemployed (*A*) receiving social assistance (*a*<*b*).

The transition from unemployment to social assistance is modelled by a constant transition probability (see e.g. Fredriksson and Holmlund, 2006).

The value functions applying to these three situations read

$$\rho V^E = h\left(w(1-\tau),1-h_E\right) + p_{ue}\left[V^U - V^E\right]$$
$$\rho V^U = h\left(b(1-\tau),1-s_u\right) + \alpha s_u\left[V^E - V^U\right] + p_{su}\left[V^A - V^U\right]$$
$$\rho V^A = h\left(b_a(1-\tau),1-s_a\right) + \alpha s_a\left[V^E - V^A\right],$$

where *w* is the wage rate, τ the tax rate, l_E working hours, p_{ue} the job separation rate, *b* unemployment benefits, α the job finding rate, s_u search effort for unemployed receiving benefits, p_{su} the transition from benefits to social assistance, b_a social assistance, and s_a the search effort for unemployed on social assistance. The instantaneous utility function $h(c,1-h)$ is a standard concave function defined over consumption and leisure. It is assumed that $V^E > V^U > V^A$. The search effort for the two types of unemployed is given as

$$h_l'\left(b,1-s_u\right) = \alpha\left[V^E - V^U\right]$$
$$h_l'\left(b_a,1-s_a\right) = \alpha\left[V^E - V^A\right].$$

Notice that $s_a > s_u$ since unemployed on social assistance have more to gain from becoming employed than those on benefits (entitlement effect).

The overall search activity in the market is

$$s = s_u u + s_a a.$$

Each employed worker produces an output, *y*, and the costs of creating a vacancy are $ky\,(k>0)$. The value functions associated with a filled (E) and vacant job (V) are given as

$$\rho J^E = y - w + p_{ue}\left[J^V - J^E\right]$$
$$\rho J^V = -ky + q\left[J^E - J^V\right],$$

where *q* is the job-filling rate, and the wage *w* is assumed to be exogenous. New jobs are created up to the point where $J^V = 0$.

The number of job matches is determined by a matching function (constant returns to scale)

$$m(s,v).$$

The job finding rate is $\alpha = m(s,v)/s$ and the job filling rate is $q = m(s,v)/v$.

Balance between inflows and outflows to the different labour market states requires

$$\left[1-u-a\right]p_{ue} = \alpha\left[s_u u + s_a a\right]$$
$$\alpha s_a a = p_{ku} u.$$

The public-sector budget constraint reads

$$B = \tau w(1-u-a) - (1-\tau)bu - (1-\tau)ab_a = 0.$$

The numerical simulations are based on the functional forms

$$h(c,1-h) = \ln(c) + \ln(1-h)$$
$$m(s,v) = As^{\eta}v^{1-\eta}.$$

The following parameter values have been used:
$A = 1$, $\eta = 0.5$, $\rho = 0.003$, $h_e = 0.4$, $y = 1$, $k = 0.1$, $b = 0.5$, $b_a = 0.3$, $p_{ue} = 0.04$, $p_{au} = 0.04$.

Comment on Andersen and Svarer: Cyclically dependent unemployment insurance

Erik Höglin[*]

It is easy to be sympathetic towards the idea that Torben Andersen and Michael Svarer lays out in their paper. I shall focus this comment on some additional issues that need to be discussed before implementing cyclically dependent unemployment insurance (UI).

1. Quantitative analysis needed

Policy proposals of this sort should ideally be supported by empirical studies. But credible econometric estimates of the consequences of cyclically dependent unemployment insurance are not readily available. A natural alternative is a quantitative analysis in a well-tested model. The authors go towards providing such an analysis. But I would have liked them to put more effort into arguing for the empirical validity of their model assumptions. As it stands now, it is difficult to infer to what extent their parameterization results in aggregate dynamics are reconcilable with actual labor market data.

To be more specific, I would have liked to see:

- the same basic model (Diamond, Mortensen and Pissarides, D-M-P),

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- carefully calibrated to match the labor market and business cycle properties of some economy that does not have business cycle contingent UI, and
- a policy experiment: introduce business cycle contingent UI and check the implications for unemployment, wages, welfare for different groups, etc.

I do acknowledge that this is not an easy task. Even though the D-M-P model is a Nobel Prize winning workhorse model frequently used by academics as well as policy organizations, some concerns have been raised as to what extent the model is able to account for stylized properties of the labor market over the business cycle. Shimer (2005) pointed out that a standard calibration is unable to match the cyclical variation of unemployment and vacancies in the United States. What happens in Shimer's calibration is that business cycle shocks are neither amplified nor propagated but rather absorbed in wages. Andersen and Svarer effectively short-circuit this property by assuming that wages are invariant to the business cycle. An alternative route would be to adopt Hagedorn and Manovskii's (2008) calibration, which they showed can 'solve' the Shimer puzzle. But their calibration is far from uncontroversial – and a key difference between Hagedorn and Manovskii's and Shimer's calibrations is the assumption on the effective UI replacement rate.

2. Long-term unemployment

The persistence of unemployment and the risk of short-term cyclical unemployment turning into long-term structural unemployment have been frequently discussed in the aftermath of the financial crisis. Barro (2010) has raised a fear that the cyclical variation of UI is at least partly to blame for the rise in long-term unemployment in the United States. He writes that "the jobless rate could have been as low as 6.8 percent instead of 9.5 percent, if jobless benefits hadn't been extended to 99 weeks."

Persistence effects are not present in Andersen and Svarer's analysis and – again – it is not trivial to introduce such effects. Nevertheless, it is an issue that has to be examined before launching a system with cyclically dependent UI.

3. Interactions with other systems

When designing the unemployment insurance system it is imperative to consider interactions with other systems. In general, one should expect that changes in unemployment benefits affect the flows not only to and from unemployment but also flows to and from sickness and disability insurance systems. There is ample empirical evidence that unemployment and disability insurance affect each other. Gruber (2000) studies a policy change in Canada giving rise to arguably exogenous changes in disability benefits and finds a significant reduction in labor force participation due to increased benefits. Gruber's paper suggests that more generous unemployment insurance reduces the disability claims, and vice versa. A direct test of this conjecture is performed by Autor and Duggan (2003). They study the interaction between aggregate unemployment and the generosity of the disability insurance system, and attribute as much as one half percentage point of the U.S. mid-1980s decline in unemployment to the contemporaneous rise in disability benefits.

In theoretical analyses of optimal unemployment and disability insurance, e.g. Höglin (2008), changes in UI trigger changes in disability insurance (DI). Whether this implies that also DI should vary with the business cycle is not obvious. On the one hand, UI and DI are closely connected through incentive constraints in the optimal insurance contract. On the other hand, the prevalence of disability is probably not very business cycle related.

4. Credible implementation

A cyclically dependent unemployment benefit can be either rules-based or discretionary. A discretionary system improves the possibilities of taking the specific situation into account. However, it may be difficult to stick to the principle of a cyclically dependent unemployment insurance: it is presumably politically much simpler to raise or extend benefits in a downturn than to reduce them again when the economy turns upwards.

A discretionary system may also involve time inconsistency problems. If the unemployed believe that the benefit level will be reduced in the next upturn, they will search for jobs more intensively when the economy

recovers. Given that the unemployed act in this way, political incentives to defer the reduction of the benefits in order to accelerate the aggregate demand recovery may be created. If the unemployed realize this, they will not increase their job search intensity and unemployment will remain unnecessarily high.

These arguments call for a rules-based system. The question then becomes what is the appropriate trigger in such a system. With a rules-based system, the unemployment insurance terms can automatically be made more generous if unemployment exceeds a threshold. One potential problem, however, is that an automatic rule of this kind does not take into account that changes in unemployment may have different causes. The goal is to make the terms more generous when cyclical unemployment increases. But a rise in equilibrium unemployment should not trigger benefit hikes or extensions, which further increases equilibrium unemployment and so forth. This also relates to the persistence effects discussed above.

Estimates of the equilibrium unemployment rate are uncertain and in general not constant over time. This may make it difficult to design fixed rules. One alternative, suggested by the Swedish Fiscal Policy Council (2009) that at least partly takes this problem into account, is to compare current unemployment with an average for the immediately preceding years and tie changes in benefit terms to deviations of a certain size from a moving average of this kind. Such a rule is presumably better at handling unemployment persistence.

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Is short-time work a good method to keep unemployment down?*

*Pierre Cahuc*** *and Stéphane Carcillo****

Summary

Short-time work compensation aims at reducing lay-offs by allowing employers to temporarily reduce hours worked while compensating workers for the induced loss of income. These programs are now widespread in the OECD countries, notably following the 2008–09 crisis. This paper finds that short-time work programs used in the recent downturn had significant beneficial effects. This suggests that countries which do not have short-time compensation programs could benefit from their introduction. But short-time compensation programs can also induce inefficient reductions in working hours and reduce the prospects of outsiders if used too intensively. Thus, the design of short-time compensation programs should include an experience-rating component.

Key words: Short-time work, unemployment, employment.
JEL classification numbers: E24, J22, J65.

* We would like to thank Lars Calmfors, Alexander Hijzen, Bertil Holmlund, Ann-Sofie Kolm, John Martin, Sebastien Martin, Stefano Scapetta, Danielle Venn, the OECD secretariat and participants in the Nordic Economic Policy Review conference on Employment Consequences of the Economic Crisis, Stockholm, 9 November, 2010, for useful comments. The opinions expressed and the arguments used here are the responsibility of the authors and do not necessarily reflect those of their corresponding institutions.

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Short-time compensation (or short-time work, STW) aims at reducing lay-offs by allowing employers to temporarily reduce hours worked while compensating workers for the induced loss of income. At present, short-time work schemes are widespread among OECD countries. They are operated in 25 of the 33 OECD countries. However, there are large cross-country differences in take-up rates, which go from zero to 7.4 percent of the employees in 2009.[1] Moreover, there has been a very important spread of short-time work during the 2008–09 recession: the OECD average take-up rate was less than 0.2 percent in the fourth quarter of 2007, just before the recession, and ballooned to 1.3 percent in the fourth quarter of 2009.

In the recent recession, unemployment did not increase in some European countries featuring widespread and generous short-time compensation programs as much as it did in other countries. The leading example is Germany that makes particularly intensive use of a short-time work program (*Kurzarbeit*). This success induced a renewal of interest in short-time work which may appear as a good method for keeping unemployment down in recessions. As a matter of fact, the interest in such schemes is not new. The idea that it could be more efficient and more equitable to share jobs with short-time compensation rather than destroying jobs during recessions is recurrently put forth by advocates of work-sharing. For instance, Abraham and Houseman (1994) argued that although the use of short-time work or the recourse to layoffs during a cyclical downturn may be reasonably close substitutes from the employer's point of view, they are quite different from the employee's perspective. Dismissed workers are likely to face considerable uncertainty about whether and when they will find a job and may experience long unemployment spells, which represent a loss of income for them and their families and a loss of resources for society. Abraham and Houseman also argue that an extensive reliance on layoffs is less equitable than work-sharing, because it concentrates the costs of adjustment to a relatively small number of workers who suffer large losses of income and other job-related benefits. Instead, short-time work arrangements spread the costs of adjustment more evenly across members of the work force. These might be important arguments in favor of short-time work to accommodate cyclical fluctuations in demand.

[1] This refers to quarterly data, not yearly averages, as shown in Figure 1.

In this paper, we argue that optimal unemployment insurance systems may include short-time compensation programs. However, short-time compensation programs are not a panacea. They must be carefully designed to improve efficiency. Actually, there is some evidence that short-time compensation programs stabilize permanent employment and reduce unemployment during downturns. But short-time compensation programs can also induce inefficient reductions in working hours. Moreover, workers in permanent jobs have incentives to support such schemes in recessions in order to protect their jobs. Employers also have incentives to support short-time compensation programs in countries where stringent job protection induces high firing costs. Therefore, there is a risk in using these programs too intensively, for the benefits of insiders and at the expense of outsiders whose entry into employment can be made even more difficult. To deal with this risk and avoid inefficient reductions in working hours, the design of short-time compensation programs should include an experience-rating component. This component would lead to a scheduling of employers' social contributions so that they bear a significant share of the cost induced by their participation in the program.

The paper is organized as follows. In Section 1, we describe the evolution of short-time compensation programs in the recent recession. In Section 2, we discuss the economic justifications of these programs. From a normative perspective, we begin by recalling that optimal unemployment insurance may include short-time compensation programs. Then, we analyze the existence of short-time work programs from a positive perspective to understand their potential consequences for actual labor markets of the OECD countries. Finally, in Section 3 we present empirical evidence on the impact of short-time compensation programs on unemployment, employment and hours.

1. Short-time work arrangements before and during the crisis

1.1 How does it work and where?

Short-time work is an option within the unemployment insurance systems that allows employers to reduce the hours of workers for economic rea-

sons, while permitting workers to receive compensation for their partial layoff. Compensation is usually supported by the unemployment insurance schemes, in the form of partial unemployment benefits, by special funds, by the State, or sometimes by a combination of these sources.[2]

Before the 2008–09 crisis, short-time work schemes were already widespread in the OECD countries:[3] such schemes existed in 18 countries. In 2009, they operated in 25 of the 33 OECD countries (see Figure 1), including most of the Continental European countries, and only five countries had no short-time work schemes.[4] Among the Nordic countries, Denmark, Finland and Norway have short-time work schemes, and among the English-speaking countries Canada, Ireland, New Zealand and the US have such schemes.

Naturally, the design and regulation of short-time work schemes vary greatly across countries (Hijzen and Venn, 2010). First, firms are usually required to meet a number of eligibility criteria to enter into short-time work arrangements. For instance, 80 percent of the countries require firms to prove that economic factors make short-time work necessary (a decline in production or in business activity). 55 percent of the countries require collective agreements, and other countries usually require either consultation with employees or individual agreements. In 40 percent of the reviewed countries, employees must also be eligible for unemployment benefits on an individual basis. Southern European countries usually set much less stringent stringent eligibility requirements than the OECD average (or than the Nordic or English-speaking countries which are close to this average).[5]

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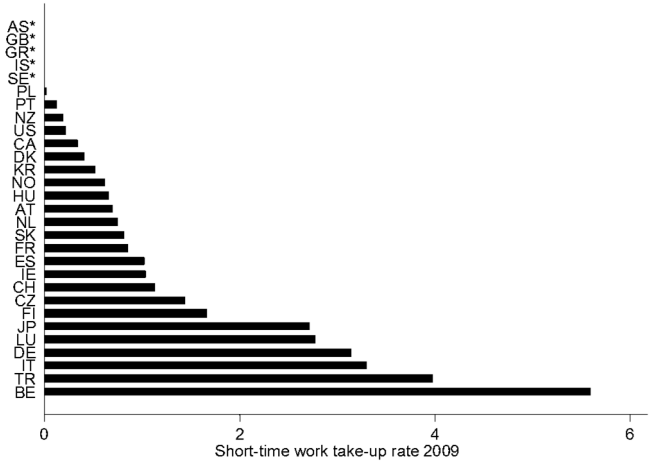
[2] *Partial* unemployment benefits are considered as part of short-time work schemes. *Part-time* unemployment benefits are not. Partial benefits are paid by the unemployment insurance to employees and relate to specific employers who reduce working time. Part-time benefits are paid to people who are unemployed but work for some time over the reference period (part-time unemployed) independently of employers, notably in countries where unemployment benefits can top up some earned income.

[3] The countries which created new schemes during the crisis (usually at the end of 2008 or the beginning of 2009) are the Czech Republic, Hungary, Mexico, the Netherlands, New Zealand, Poland and the Slovak Republic.

[4] Australia, Greece, Iceland, Sweden and the UK. For four countries, information on STW schemes is not available (Chile, Estonia, Mexico and Slovenia).

[5] For the purpose of the empirical analysis in Sections 1.2 and 3.3, an eligibility index is built: its value is 0 when no criteria are required for entry into short-time work schemes, and each additional criterion is assigned a value of either 1 or 0.5 for those which only apply to some categories of employees (e.g. blue-collar workers).

Figure 1. Short-time work take-up rates in the OECD countries as a percentage of employees



Source: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors.

Notes: * no schemes in Australia, Greece, Iceland, Sweden and the UK. Data are missing for Chile, Estonia, Mexico, and Slovenia. Country codes: AS: Australia; AT: Austria; BE: Belgium; CA: Canada; CH: Switzerland; CZ: Czech Republic; DE: Germany; DK: Denmark; ES: Spain; FI: Finland; FR: France; UK: United Kingdom; GR: Greece; HU: Hungary; IE: Ireland; IS: Iceland; IT: Italy; JP: Japan; KR: Korea; LU: Luxembourg; NL: Netherlands; NO: Norway; NZ: New Zealand; PL: Poland; PT: Portugal; SE: Sweden; SK: Slovak Republic; TR: Turkey; US: United States.

Short-time work schemes are also most often conditional on one (most often) or several actions to be taken by firms or employees. Those include the commitment not to dismiss employees for a certain period after the end of short-time work compensation (six countries, half in Western Europe), job search requirements (five countries), the design of a recovery plan (four countries), and training of employees (four countries). Nordic countries make short-time work compensation conditional on job search, while Asian countries (Japan and Korea) and English-speaking countries set no conditions at all.[6]

Regarding the generosity of the schemes, the key parameters to consider are the maximum number of hours that can be compensated per employee, the maximum duration of compensation, the net replacement rate, and the remaining cost of reduced hours (OECD, 2010; Hijzen and

[6] Similarly to what is done with eligibility criteria, a conditionality index is built: its value is 0 when no condition is associated with short-time compensation, and each additional condition is assigned a value of either 1 or 0.5 for those which only apply to some categories of employees.

Venn, 2010[7]). These parameters were often modified in 2008 in countries where schemes existed before the crisis in order to make short-time work even more appealing. In 2009:

- Working-time reduction can be either total or partial, depending on the rules of each scheme. For instance, a 100 percent cut in hours can sometimes be justified when a production unit must be temporarily shut down because inventories are too high. On average, the permissible working-time reduction, i.e. the share of normal working time that can be cut,[8] is 74 percent. For the three Nordic countries, the average is 63 percent, while it is only 38 percent for the English-speaking countries. Half of the countries allow reductions in hours between 90 percent and 100 percent of normal working time, with higher rates in Eastern and Southern Europe.
- A maximum duration of compensation prevails in all countries, notably because the economic reasons that normally justify short-time work must be temporary by nature. The country average is approximately 15 months, but this parameter also varies a great deal across countries: from three months in the Slovak Republic to 28 months in Japan (and even longer in Finland where the 36-month limit was removed during the crisis[9]). The average is only nine months for the English-speaking countries. The duration is longest among Southern European countries with 22 months on average.
- The net replacement rate can be calculated as the ratio of the net income of employees in the scheme to the net income that would stem from normal working time. In most countries, income falls progressively as hours fall further below their normal level.[10] On average, the minimum compensation rate is 71 percent of the full-time

[7] We here follow the analytical framework set out by Hijzen and Venn (2010). We have used the value of the parameters they identified for 2009, and we have complemented these data with values for 2007 (before the crisis) for the parameters used in Section 3.3.

[8] For instance, if in a given country the minimum working-time reduction is, say, 10 percent and the maximum is 100 percent, the overall permissible reduction is 90 percent of the working time. The possibility to cut working time by smaller amounts allows the employers to use short-time work schemes more easily and more frequently. The maximum reduction provides another obvious margin of flexibility. The permissible working-time reduction allows us to take into account these two different margins of flexibility in the use of short-time work.

[9] However, a maximum payment period of 500 full-time equivalent working days remains.

[10] In Hungary and Korea, however, workers receive their full wage for all reduced hours (Hijzen and Venn, 2010).

wage. In comparison, the full-time unemployment net replacement rate is 58 percent on average[11] in the first month of unemployment in the same countries. In Denmark and Norway,[12] the average compensation rate is the highest among countries at 78 percent (in comparison, 59 percent for unemployment benefits), and in English-speaking countries this rate reaches a low 62 percent (46 percent for unemployment benefits).

- In a majority of countries, employers bear a share of the total cost of compensation for each reduced hour. This is obviously a way of coping with moral hazard issues and of inciting firms not to abuse the system. Among the 14 countries where employers contribute, the remaining cost per hour not worked[13] is close to 20 percent of the total normal labor cost. Among the Nordic countries, Norwegian employers pay a below-average cost of 17 percent, while their counterparts in the English-speaking countries (the US and New Zealand) bear an above-average cost of 32 percent.

1.2 An overview of take-up before and during the crisis

Even in the context of the exceptional downturn experienced by most of the OECD economies in 2008 and 2009, the recourse to short-time work varies a great deal across countries. Take-up can be measured as the ratio of short-time work participants to the total number of employees in a given country.[14] In 2009, six countries where short-time work existed prior to the crisis stand out with take-up rates above 2 percent of the employees: Belgium, Turkey, Italy, Germany, Luxembourg and Japan (see Figure 1).

[11] For a single worker with no children earning the average wage. The data come from the OECD taxes and benefits database.

[12] This information is not available for Finland.

[13] For a single worker with no children earning the average wage.

[14] This ratio is rather a pseudo take-up rate, since all employees are not necessarily eligible for short-time work schemes, depending on the eligibility conditions set in each country.

Figure 2. Short-time work take-up rates in the OECD countries 2003–10 as a percentage of employees

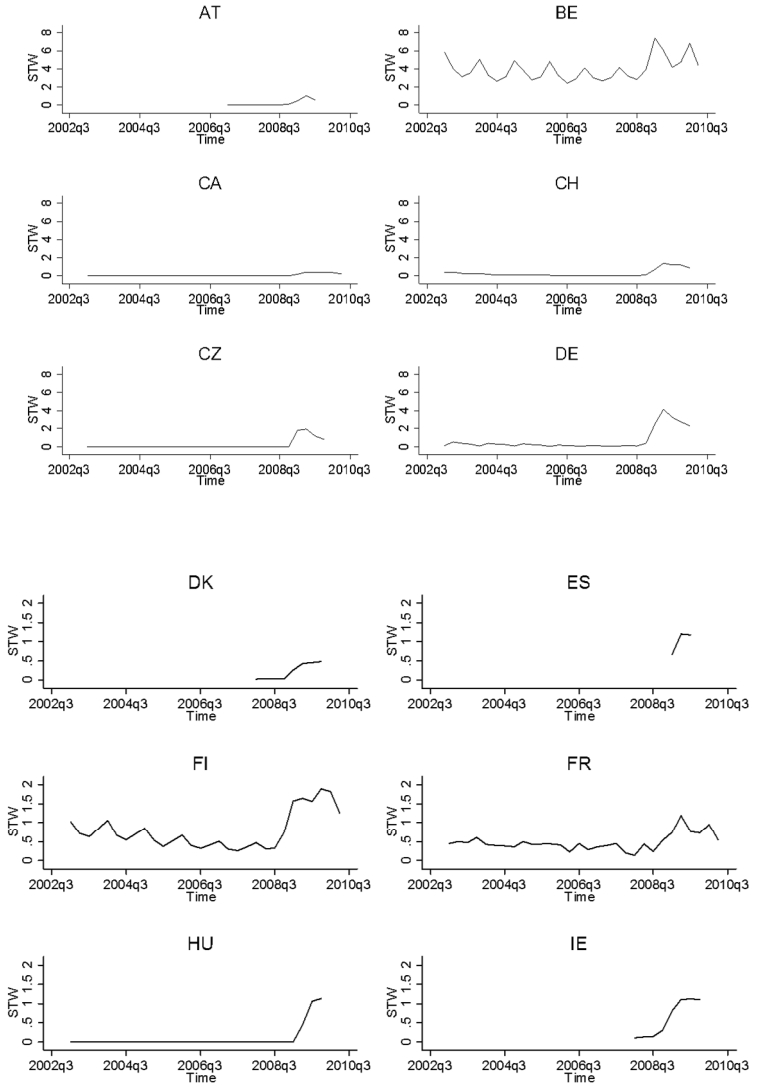
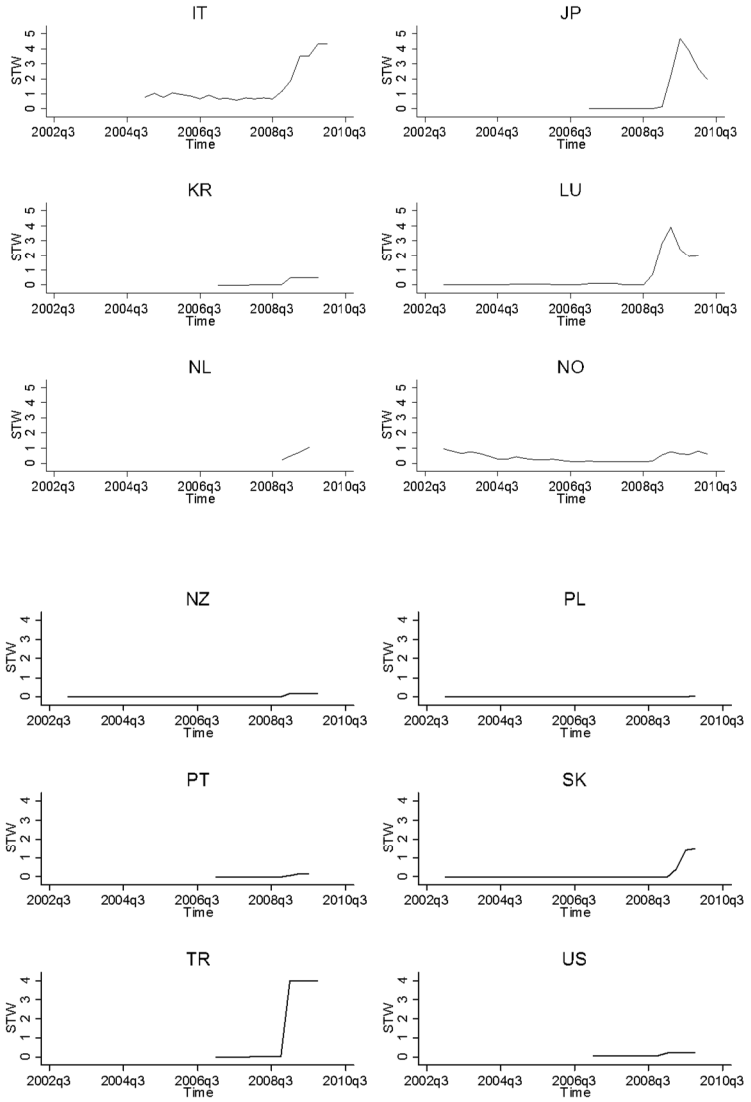


Figure 2. Continued….



Source: OECD (2010) and Hijzen and Venn (2010). Data complemented by the authors.

Note: STW: Short-time work take-up rate.

At the other end of the scale, the countries of Northern Europe (except Finland) either show low take-up rates (such as Denmark and Norway, below 1 percent), or no short-time work scheme at all (such as Iceland and Sweden). The English-speaking countries (except Ireland) show a similar pattern (a take-up below 0.5 percent in Canada, New Zealand and the US, no scheme in Australia and the UK).

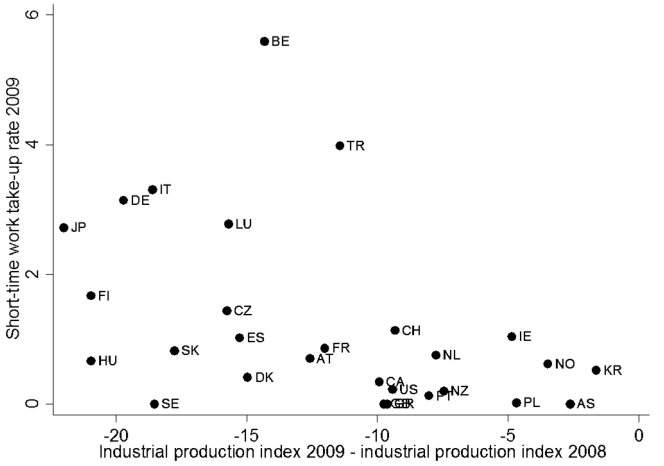
In most countries where schemes existed prior to the crisis, participation in short-time work arrangements increased dramatically in 2009 to reach unprecedented levels (except in Norway and Belgium, where the levels were similar or close to the levels in 2003, see Figure 2, and in Germany, where the take-up rates were very high in 1993 – not shown).

The magnitude of the recession is, of course, one of the determinants of the recourse to short-time work. A high take-up of short-time work on average in 2009 is usually associated with a strong decline in industrial production measured between end-2008 and end-2009 (see Figure 3, using the OECD industrial production index). Interestingly, countries with high take-up rates in 2009 are also those where the production index recovered significantly over the same year. This can be interpreted in various ways. One possibility is that countries where the decline in industrial production was the largest at the end of 2008 were also those where the expected rebound would be the largest in 2009 (once inventories have reached a bottom). Another possible explanation is that in those countries, the labor force in the industry was maintained during the crisis, allowing firms to react more quickly to the upturn.

Take-up rates do not appear to be related to the stringency of conditions required to benefit from short-time compensation (commitment to not dismiss employees for a certain period after the end of short-time work compensation, job search requirements, the design of a recovery plan, training of employees). The correlation coefficient between our conditionality index and the take-up rate is zero in 2009. It might be that these conditions do not play an important role because they are difficult to enforce in several countries.[15]

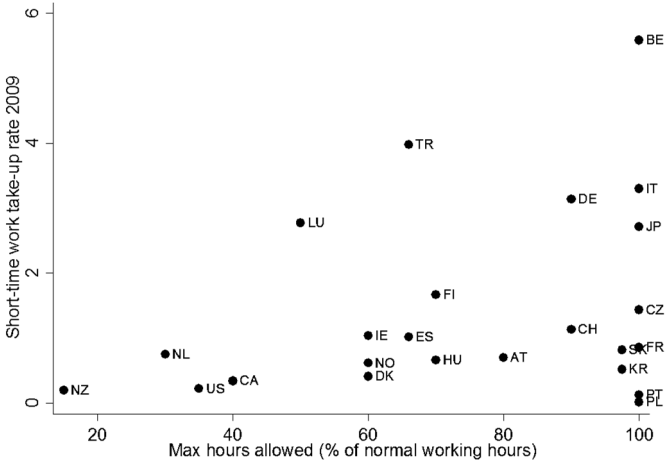
[15] A more sophisticated index including a different weight for each specific component could yield different results, but the choice of weights would be arbitrary.

Figure 3. Industrial production index and short-time work take-up rate



Source: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors, OECD industrial production index.

Figure 4. Permissible reductions in weekly working hours and short-time work take-up rate

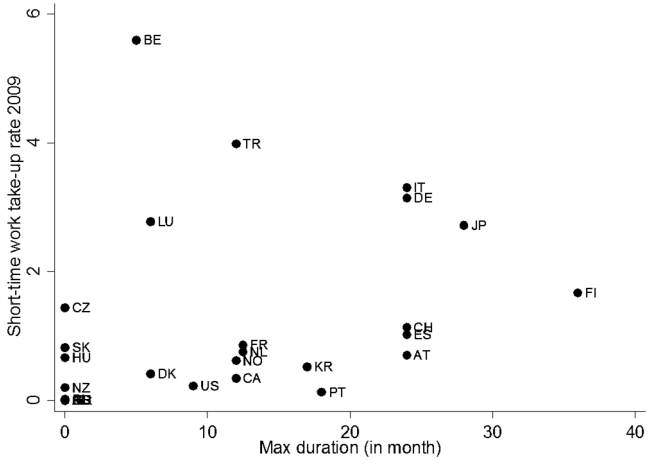


Source: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors.

Note: Permissible reductions in weekly working hours are the shares of normal working time that can be reduced within STW schemes.

However, there is a positive correlation, equal to 31percent in 2009,[16] between the take-up rate and the eligibility criteria to enter into short-time work arrangements (including requirements to prove that economic factors make short-time work necessary, requirement of collective agreements, requirement of consultation of employees or of individual agreements, and eligibility for unemployment benefits). Countries with large take-up rates also tend to have more sophisticated eligibility systems. Other parameters of short-time schemes are also clearly correlated with take-up (at least in 2009). The correlation between the take-up rate and the permissible reductions in weekly working hours that can be compensated amounts to 43 percent. For instance, countries with a high take-up authorize reductions in hours of at least 50 percent or more of normal working time (see Figure 4). The correlation between the take-up rate and the maximum duration of the scheme, expressed in months, is 28 percent (see Figure 5). Similarly, in most countries where the take-up is highest, the remaining cost of reduced hours for employers is actually 0 or less than 10 percent of the normal total cost (see Figure 6).

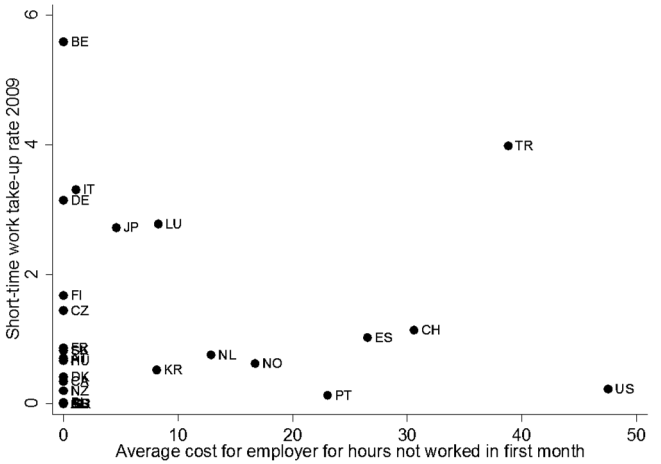
Figure 5. Maximum duration of scheme participation and short-time work take-up rate



Source: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors.

[16] Here and in what follows, a correlation refers to the simple correlation coefficient between two variables, not to the regression coefficient, i.e. the slope of the lines shown in the scatter diagrams.

Figure 6. Average remaining cost for employers and short-time work take-up rate



Source: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors.

2. The consequences of short-time work: Theory

Short-time work can be justified from the point of view of the unemployment insurance system. It turns out that it can be efficient to combine unemployment benefits provided to full-time unemployed workers with short-time compensation provided to short-time unemployed workers. However, the existence of short-time work observed in OECD countries does not necessarily only rely on efficiency considerations. The spread of short-time work can also be influenced by insiders supporting part-time work in order to try to protect their jobs in deep recessions. This implies that part-time work arrangements may potentially protect the jobs of some categories of workers at the expense of others.

2.1 Optimal unemployment insurance and short-time work

The analysis of optimal labor contracts shows that optimal insurance can comprise layoffs and short-time work schemes (Rosen, 1985). The precise form of the insurance contract hinges on the preferences of workers and the technology of firms. For instance, Rosen (1985) and Fitzroy and Hart (1985) have developed models where the (monthly) wage is flexible

and hours of work are adjusted when productivity is above a certain threshold, while the (monthly) wage is downward rigid and layoffs are instead used when productivity is below this threshold.[17] In such a model, it can be optimal to include work-sharing schemes in unemployment insurance. However, this analysis assumes that insurance is directly provided by risk-neutral employers, having access to perfect financial markets. Actually, in most countries workers are covered by public unemployment insurance systems which face moral hazard issues stemming from the behavior of employers and employees.

From this perspective, the introduction of short-time work arrangements in unemployment insurance is often seen as a means of avoiding *excess layoffs* (e.g. Fitzroy and Hart, 1985; Burdett and Wright, 1989).[18] In the presence of an unemployment insurance which provides unemployment benefits to full-time unemployed workers only, it is well known that there are excess layoffs if employers have no incentives to internalize the social cost of their decisions. Feldstein (1976), and more recently Blanchard and Tirole (2007) as well as Cahuc and Zylberberg (2008), claim that experience-rating systems, where employers' social contributions depend on the induced social cost of their firing decisions, can be used to reduce excess layoffs. These layoffs can be completely eliminated when there is full experience-rating, i.e. when each firm fully covers the induced social cost of its firing decisions. However, there are limits to experience-rating.[19] Notably, many firms – especially small ones which have limited access to financial markets – may face financial constraints in the short run and go bankrupt if they have to cover the social costs of their layoffs. For these reasons, full experience-rating is unlikely to be optimal and unemployment insurance is necessarily plagued with excess layoffs. In these circumstances, a system combining short-time work arrangements with unemployment benefits seems more equitable and

[17] In their framework, the production technology is multiplicatively separable between hours and workers, and there is no income effect on labor supply.

[18] Although there is a quite abundant literature on optimal unemployment insurance, there are only a few recent papers about the optimality of short-time work schemes. Most recent research about optimal unemployment insurance has focused on the optimal level of unemployment benefits, their time profile during the unemployment spell, the impact of sanctions, the consequences of monitoring (Fredriksson and Holmlund, 2006) and the desirability of experience-rating (Blanchard and Tirole, 2009). In most recent papers, hours are not taken into account. Workers can either work or be unemployed.

[19] See Blanchard and Tirole (2007) for a discussion.

efficient than unemployment benefits only. This system can be more efficient because it reduces excess lay-offs encouraged by the implicit subsidies paid out by the public unemployment insurance. It is also more equitable because short-time schemes distribute the adjustment burden over a large number of workers (Abraham and Houseman, 1994; Walsh et al., 1997; Vroman and Brusentev, 2009).

However, Burdett and Wright (1989) claimed that short-time work is not a panacea. In fact, the same problem which plagues unemployment insurance, i.e. excess lay-offs in the case of partially experience-rated systems, also creates distortions under short-time work arrangements. Short-time schemes implemented by unemployment insurance can bias the average number of hours worked downwards because they subsidize reductions in working time. Accordingly, they induce inefficient reductions in working time in the absence of incentive schemes that would limit their recourse. An experience-rating system, where employers and employees reimburse the cost due to their utilization of short-time work, may provide adequate incentives.[20] Unfortunately, as mentioned above, full experience-rating is generally not efficient when firms do not have access to perfect financial markets, and excess short-time cannot be fully eliminated.[21]

To sum up, the analysis of unemployment insurance in a second-best environment featuring imperfect financial markets suggests that an efficient system should combine unemployment benefits given to unemployed workers, short-time work schemes and experience-rating which implies that the social contributions paid by employers to finance unemployment insurance depend on the costs induced by their layoffs *and* their utilization of short-time work schemes. The precise optimal combination of these different elements depends on the preferences of workers, the technology of firms and the functioning of markets. This might explain the strong cross-country heterogeneity in the implementation of short-time work schemes described in the previous section. For instance, it

[20] Other strategies of limitations to STW recourse have instead been implemented by some countries, such as a share of the benefits directly borne by employers, or the commitment not to lay off workers for some time after the end of the short-time work period.

[21] In practice, experience-rating has been implemented in the United States only, including temporary layoffs (see Burdett and Wright, 1989). The fact that no other country has yet implemented this system can stem from political economy (winners, losers) or practical considerations (potential complexity) rather than because the system might not be fully efficient.

might be true that countries where workers have a strong aversion to geographic mobility, because they have strong family ties (Alesina et al., 2010) or strong local ties (Janiak and Wasmer, 2010), favor adjustments of hours of work and income at the expense of layoffs. In countries where commuting costs and imperfections of the housing markets induce a decline in geographical mobility, workers and employers might also display the same preference.

2.2 Interactions with other regulations and political economy issues

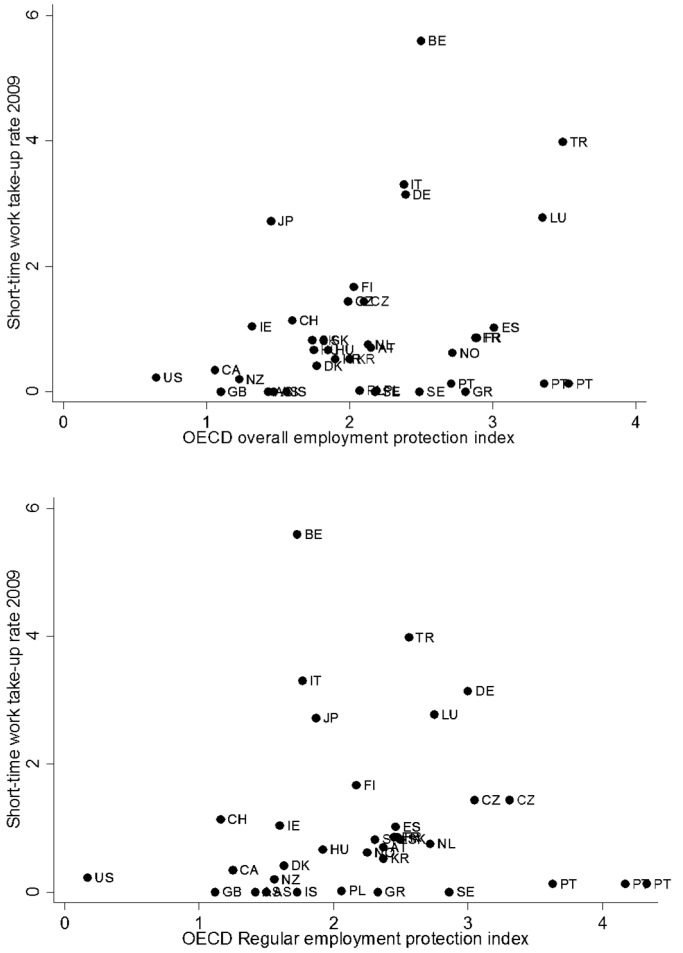
Most countries where it is difficult to lay off workers have also designed institutional mechanisms to make these discharges less necessary. Short-time work schemes are one such measure. When layoffs are costly, employers have incentives to support short-time schemes which allow them to save on firing costs. Short-time work arrangements are also supported by insiders, who may prefer part-time unemployment combined with some work income to full time unemployment.

As claimed by the OECD (2010, ch. 1), there is some evidence of a cross-country trade-off in regulations affecting internal and external flexibility. Short-time work schemes also tend to be more developed in countries with stricter employment protection rules, notably Belgium, Germany, Italy, Luxemburg and Turkey. This is apparent in Figure 7, which displays the relation between short-time work take-up rates in 2009 and the overall strictness of employment protection index of the OECD. There is a positive correlation between the stringency of employment protection and short-time work take-up rates. The correlation coefficient between quarterly short-time-work rates and the OECD overall employment protection index over the period 2007–09 is equal to 22 percent.

One may also expect a relation between short-time work take-up rates and unemployment benefits. This relation can rely on different mechanisms. To the extent that short-time work schemes generally constitute a part of unemployment insurance, more generous unemployment insurance systems can have higher unemployment benefits and more generous short-time work arrangements. However, the relation between short-time work take-up rates and unemployment benefits could also be the consequence of a trade-off between short-time compensation and unemployment benefits. Figure 8 displays the relation between unemployment ben-

efit replacement rates and short-time work take-up rates in the OECD countries in 2009. The correlation coefficient between quarterly short-time work take-up rates and unemployment benefit replacement rates for OECD countries over the period 2007–09 is positive but small, and equal to 11 percent.

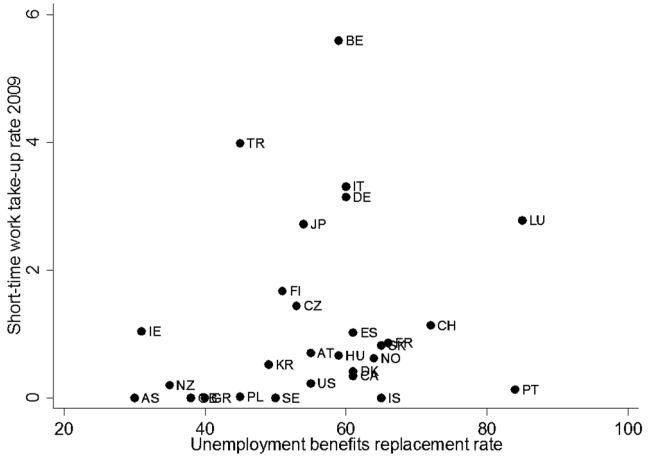
Figure 7. Employment protection indexes and short-time work take-up rates



Sources: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors, OECD's Employment protection index.

The positive relations between short-time work schemes on the one hand and unemployment benefits and job protection on the other hand suggest that cross-country differences in short-time work schemes do not only reflect efficiency considerations. They might also reflect differences in the power of insiders. This implies that short-time schemes are not necessarily beneficial to *all* workers. They may benefit insiders, but not outsiders who may suffer from short-time work.

Figure 8. Unemployment benefit net replacement rates and short-time work take-up rates



Sources: OECD (2010) and Hijzen and Venn (2010) data complemented by the authors, OECD tax and benefits database.

3. Empirical evidence

In this section, we analyze the effects of short-time work on hours, employment and unemployment. We first provide a brief survey of the literature. Then, we present empirical evidence on the consequences of short-time work in the recent recession using cross-country data over the period 2003-09.

3.1 Firm-level studies

Some studies use firm-level data to explore the impact of short-time work schemes on various outcomes, including employment. Calavrezo et al. (2009a,b) assess the impact of short-time work arrangements in France on layoffs and firm survival. Surprisingly, they find that short-time work is associated with more layoffs and a lower survival of firms. This may indicate a selection bias problem due to the fact that participating firms tend to be less competitive than other firms. If this selection problem is not adequately addressed, it may be falsely concluded that short-time compensation programs result in more layoffs and more destructions of firms.

There are also several studies focused on *Kurzarbeit*, the well-known and long-standing STW program in Germany. Deeke (2005) showed that a high proportion of firms using Kurzarbeit did not reduce their payrolls and hire new staff with more flexible nonstandard work contracts such as "Mini-Jobs". In fact, companies employing workers with flexible work contracts (e.g. temporary and part-time contracts, freelancers etc.) rely less on short-time schemes, which suggests that short-time schemes are a way of enhancing internal flexibility, especially when employment protection legislation is stringent.

The report of Berkeley Planning Associates & Mathematica Policy Research Inc. (1997) reviews short-time compensation programs in the United States. When the report was released, 17 states operated short-time compensation programs, 36 states and jurisdictions did not. These programs were implemented between the late 1970s and the mid-1990s. The report does not yield any clear-cut conclusions about the impact of short-time compensation schemes on unemployment insurance systems and layoffs. This report also mentions that the extensive repeat use of short-time compensation and the greater economic distress among short-time compensation firms than among non-short-time compensation firms, should deserve further investigation to deal with the selection bias problem which plagues the results of empirical work relying on firm-level data.

3.2 Country-level and industry-level studies

Abraham and Houseman (1994) was the first study to yield systematic cross-country evidence on the consequences of short-time schemes. Abraham and Houseman were challenging the idea that job security regulations, which became more stringent in European countries in the 1970s and the 1980s, were significantly slowing down the adjustment of total hours of work to an unexpected shock. They argued that strong job security regulations have typically been accompanied by measures intending to facilitate alternatives to layoffs such as work-sharing. Abraham and Houseman wanted to understand whether and to what extent variations in working hours offered employers a viable substitute to adjustment through layoffs. For this purpose, they compare aggregate adjustment patterns in employment and hours worked across countries and over time using quarterly time-series data for Belgium, France, Germany and the US. They find that the adjustment of employment to changes in output is much slower in the German, French and Belgian manufacturing sectors than in the US manufacturing sector, even though the adjustment of total hours worked (i.e. hours times employment) appears to be similar in the former countries. The adjustment of weekly hours is faster in Belgium, France and Germany where short-time compensation programs operate.

Van Audenrode (1994) analyzes the adjustment of hours and employment in ten OCED countries over the period 1969–88. He finds that five countries display comparably fast adjustments in total hours: the US, Belgium, Denmark, Italy, and Sweden. In the four European countries, this quick adjustment in total hours happens despite much slower employment adjustments than in the US. Van Audenrode argues that there are more generous short-time systems in these European countries than in the US.[22] Therefore, he concludes that generous short-time compensation programs result in flexible work and foster a fast adjustment in total hours despite restrictions on firings. He also argues that working time is not sufficiently flexible to compensate for the slower employment adjustments generated by the restrictions on firings in the countries with less generous or no short-time compensation programs.[23] Van Audenrode

[22] Note that Sweden does not have any government-support system for short-time work.

[23] Japan behaves differently than the other countries in the sample. Despite few formal restrictions on firings, employment adjusts very slowly. This observation corresponds to the traditional image of a large share of the Japanese labor market providing lifetime jobs. However,

finds that the overall labor adjustments end up being as flexible as in the US in countries with strong job protection because working-time adjustments compensate for restrictions on firings.

The two previous studies of Abraham and Houseman (1994) and Van Audenrode (1994) give some evidence on the consequences of short-time work schemes before the 1990s. After the publication of these two studies, short-time work schemes did not catch much attention among economists. However, the strong increase in short-time work during the recent recession has sparked off a renewal of interest.

The recent paper by Hijzen and Venn (2010) from the OECD exploits the cross-country and time variation in take-up rates to analyze the quantitative impacts of short-time compensation programs on employment and average hours in the 2008-09 recession. Their analysis is based on quarterly data for the period 2003-09 for 19 OECD countries and four industries (manufacturing, construction, distribution and business services). The analysis also distinguishes between permanent workers and temporary workers. Among the 19 countries, 11 countries operated a short-time compensation scheme during the entire period, five countries introduced a new scheme during the crisis period and three countries never had a short-time compensation scheme during the sample period. The impact of short-time compensation programs is estimated with an interaction term between a dummy signalling the 2008–09 recession and another variable measuring the extent of short-time compensation programs in each country. The estimates support the conclusion that short-time compensation programs had an important impact on preserving *permanent* jobs during the economic downturn, with the largest proportional impacts in Japan and Germany. Using the baseline estimates, it is found that 0.7 to 0.8 percent of the jobs were saved in Germany and Japan, respectively. Their estimates suggest that STW had no significant impact on either the employment or the average hours of *temporary* workers.

Similarly, Arpaia et al. (2010) evaluate the impact of short-time compensation programs in the 2008–09 recession with data covering 27 European countries over the period 1991Q2–2009Q3. The dependent variable is the annualized change in employment in the manufacturing sector.

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despite having generous short-time compensation programs, Japan does not seem to have a fast adjustment of hours either. One possible explanation could be that the margin of adjustment is more often earnings than hours (via the fluctuations in bonuses).

The impact of short-time compensation programs is estimated with an interaction term between a dummy signalling the 2008–09 recession and another dummy signalling countries with short-time compensation programs. Country-fixed effects are also included. The findings confirm those obtained by Hijzen and Venn (2010): the value of the coefficient associated with the interaction term is positive and significant.

This short overview shows that empirical research suggests that short-time work arrangements reduce the volatility of employment and increase the adjustment of hours. However, our knowledge is still very limited. Empirical studies are weakened by important selection biases and endogeneity issues. Studies which rely on firm-level data have difficulties in dealing with the selection bias due to the fact that participating firms tend to be less competitive than other firms. In studies relying on cross-country data, the issue of the endogeneity of short-time compensation programs is not addressed. Yet, the recent recession shows that governments and social partners improved the access to short-time work schemes when there was an increase in unemployment in order to try to limit job destructions.

3.3 The impact of short-time work in the recent recession

We now analyze the consequences of short-time work programs on unemployment and employment in the recent recession. To deal with this issue, we use the OECD (2010) quarterly database on short-time work take-up rates, which is updated to include a larger number of countries (up to 25). Unemployment and employment quarterly data are from the OECD harmonized labor market database, which is built from national Labor Force Surveys (no seasonal adjustment).

To evaluate the relation between short-time compensation programs and unemployment, we estimate the following model:

$$u_{ct} = \alpha_0 + \alpha_1 D_t + \alpha_2 STW_{ct} + \alpha_3 X_c \times D_t + \eta_c + \varepsilon_{ct},$$

where u_{ct} denotes the unemployment rate of country *c* at date *t*. D_t is a dummy variable which takes the value of 1 from the date of entry of the world economy into the recession (the first quarter of 2008) and which is 0 before this date. SWT_{ct} is the short-time work take-up rate in country *c*

at date *t*. X_c is a vector of time invariant controls, which comprises indicators of employment protection legislation and the generosity of unemployment benefits proxied by the net replacement ratio.[24] η_c is a country-fixed effect which includes all time invariant characteristics, like the degree of coordination of wage bargaining for instance. ε_{ct} is an error term.

This set-up allows us to take into account the impact of a common macroeconomic shock from the beginning of the recession. The interaction term between the dummy variable D_t, which represents the shock, and the controls X_c implies that the impact of the shock can differ across countries, as in Blanchard and Wolfers (2000). Moreover, our set-up includes country-fixed effects which account for time invariant unobserved variables that could influence the unemployment rate.

Let us denote by Δx_t the difference between *x* at date *t* and its average over the year 2007. Then, the above equation can be written as

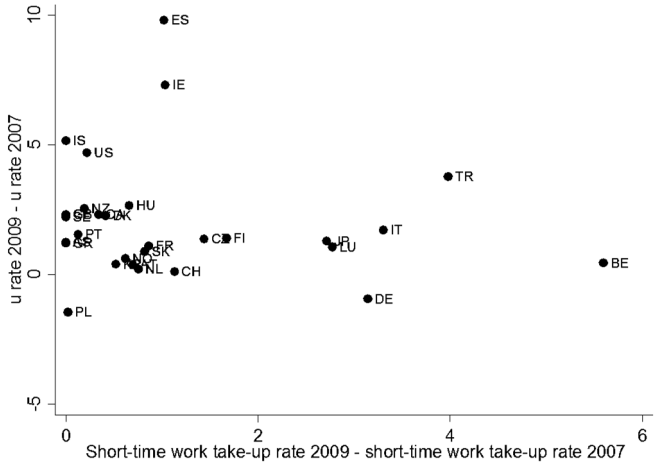
$$\Delta u_{ct} = \alpha_1 + \alpha_2 \Delta STW_{ct} + \alpha_3 X_c + \Delta \varepsilon_{ct}. \qquad (1)$$

This equation estimates the relation between changes in the unemployment rate and changes in the short-time work take-up rate.

The relation between changes in unemployment rates and changes in short-time work take-up rates between 2007 and 2009 is displayed in Figure 9. At first sight, there is a slightly negative relationship between these two variables. Some countries, like Germany and Belgium, experienced higher increases in the take-up rate associated with lower unemployment increases. Figure 10, which presents the relation between changes in employment rates and changes in short-time work take-up rates, gives a similar picture: the relation between changes in employment rates and changes in short-time work take-up rates is slightly positive.

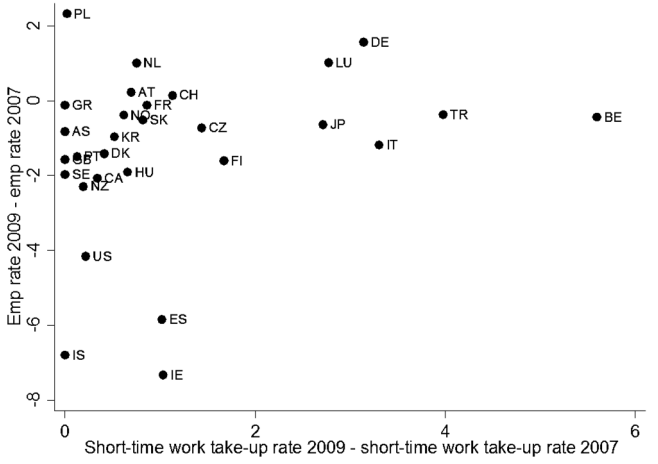
[24] Because there are very small changes in the employment protection legislation indexes and the replacement ratios, we only consider the average of these variables over the period 2007-09. This strategy has the advantage that we do not have to deal with the potential endogeneity of these policies during the recession. Indeed, it is possible that strong increases in unemployment induce the government to change these policies. For the same reason, we do not include active labor market policies in the regressions. It is also possible to introduce an interaction between the short-time work take-up rate and the time dummy. However, since the short-time work take-up rate is either equal to zero or very close to zero before the recession in most countries, as shown by Figure 2, there are not enough observations to estimate the coefficient associated with such an interaction term.

Figure 9. The cross-country relation between changes in unemployment rates and changes in the short-time work take-up rates 2009–07



Source: OECD (2010) database, updated by the authors.

Figure 10. The cross-country relation between changes in employment rates and changes in the short-time work take-up rates 2009–07



Source: OECD (2010) database, updated by the authors.

OLS estimates of equation (1) are displayed in Table 1. We estimate the model over two different periods: (1) the period 2008–09; (2) the

period 2009, which allows us to evaluate the impact of short-time work at the peak of the recession only.

Table 1. Short-time work and unemployment

Dependent variable:	**Δ Unemployment rate**	
	(1)	**(2)**
Δ STW take-up rate	0.382***	0.013
	(0.101)	(0.129)
EPL regular	-0.807***	-0.888***
	(0.160)	(0.236)
EPL collective	-0.374***	-0.438**
	(0.113)	(0.168)
EPL temporary	0.058*	0.053
	(0.097)	(0.149)
Unemployment benefits	0.017**	0.017
	(0.009)	(0.013)
Period	2008-2009	2009
Adj. R^2	0.166	0.133
Observations	200	100

Notes: Δ Unemployment rate (and Δ STW take-up rate) is the difference between the unemployment (and short-time work take-up) rate and its average over the year 2007. All other variables are in levels. OLS estimates of equation (1) for the unemployment rate. *** statistically significant at the 1 percent level, ** at the 5 percent level, * at the 10 percent level. Standard deviations in brackets.

Column 1 shows that the coefficient associated with the short-time work take-up rate is positive and significant when the estimations cover the period 2008–09. This positive sign is likely to reflect the endogeneity of short-time work, which necessarily increases with unemployment. This effect should be stronger at the beginning of the recession, when there is a strong increase in unemployment. This interpretation is consistent with the results displayed in column 2, where the coefficient for the short-time work take-up rate is not significantly different from zero. Table 1 also shows that changes in the unemployment rate are strongly associated with the OECD indexes of employment protection legislation. A more stringent regulation of regular jobs and of collective dismissals is associated with lower increases in unemployment rates. Strikingly, a stronger regulation of temporary jobs is not related to a change in unemployment.

The OLS estimation of an alternative equation where the dependent variable is the change in the employment rate is presented in Table 2. The coefficient for short-time work take-up is not significantly different from zero. Overall, these results do not show any significant positive relation between the spread of short-time work programs and employment.

However, it should be stressed that the variable ΔSTW_{ct}, the short-time work take-up rate, is likely to be correlated with the error term $\Delta\varepsilon_{ct}$ in equation (1). There are at least two reasons for this. First, as just explained, the rules of short-time work schemes imply that take-up rates increase when economic conditions deteriorate and thus when unemployment increases. Second, it was shown that several governments introduced short-time work programs in the recent recession in order to fight unemployment, while other governments eased the entry into these programs when they were already in place before the downturn. Therefore, countries that had stronger adverse shocks, corresponding to larger $\Delta\varepsilon_{ct}$, could also have larger changes in the regulation of short-time work programs. Accordingly, it is important to instrument short-time work take-up rates, i.e. to find variables correlated with short-time work take-up rates from 2008, but not correlated with the error term $\Delta\varepsilon_{ct}$. Our instrumental variables belong to the set of parameters which describe the features of short-time work programs *before* the entry into the recession, i.e. in 2007. This choice is made for two reasons. First, it is likely that the take-up rates have been stronger during the recession in countries where short-time work programs existed or were more generous before the recession, because it takes time to adapt the regulations and implement short-time work programs. Second, it is likely that the features of short-time work arrangements *before* the entry into the recession are not correlated with the error term $\Delta\varepsilon_{ct}$ which is related to changes in unemployment *during* the recession. This is our identifying assumption.[25]

[25] This identification strategy does not allow us to have time varying instruments.

Table 2. Short-time work and employment rate

Dependent variable:	**Δ Employment rate**	
	(1)	**(2)**
Δ STW take-up rate	-0.083	0.229
	(0.108)	(0.141)
EPL regular	0.694 ***	0.822***
	(0.171)	(0.257)
EPL collective	0.374 ***	0.435**
	(0.121)	(0.183)
EPL temporary	0.217**	0.336**
	(0.104)	(0.162)
Unemployment benefits	-0.026***	-0.032**
	(0.009)	(0.014)
Period	2008-09	2009
Adj. R^2	0.143	0.252
Observations	200	100

Notes: Δ employment rate (and Δ STW take-up rate) is the difference between the employment (and short-time work take-up) rate and its average over the year 2007. All other variables are in levels. OLS estimates of equation (1) for the employment rate. *** statistically significant at the 1 percent level, ** at the 5 percent level, * at the 10 percent level. Standard deviations in brackets.

Table 3 presents the result of the IV estimates for the period 2008–09 and for the year 2009 only. The short-time work take-up rate from 2008Q1 is instrumented with the permissible reductions in weekly working hours that can be compensated before 2008 and the short-time work take-up rate in 2007. These instruments allow us to account for the generosity of short-time work programs and their potential adaptability to economic fluctuations *before* the recession. With these instruments, the assumption that short-time work is exogenous in equation (1), when the change in unemployment is the dependent variable, is rejected at a zero percent level of significance for the period 2008–09 as shown in Table 3, column 1. The instruments pass the Sargan over-identification test. Table 3, column 1, shows that the change in the short-time work take-up rate is significant at the five-percent level and large: it is not statistically different from 1 in absolute value. Column 2 shows that this coefficient has the same magnitude and is significant at the one percent level when the estimates cover the year 2009 only. In OLS estimations, this coefficient was either positive or not significantly different from zero, depending on the period. As stressed before, such results might reflect an endogeneity bias

which is treated with the IV methods which yield stable results.[26] It is also worth noting that regular employment protection limits unemployment hikes while temporary job protection is associated with larger increases in unemployment.

The results for employment are presented in columns 3 and 4. Independently of the period considered, they are consistent with those obtained with the unemployment rate: the coefficient associated with a short-time work take-up rate is not statistically different from one at the 5 percent level confidence rate. Moreover, regular employment protection has a positive impact on employment during the crisis.

Table 3. Short-time work, unemployment rate and employment rate

Dependent variable:	**Δ Unemployment**		**Δ Employment**	
	(1)	**(2)**	**(3)**	**(4)**
Δ STW take-up rate	-1.24**	-1.236***	1.142**	0.919**
	(0.638)	(0.450)	(0.561)	(0.389)
EPL regular	-0.782***	-0.829***	0.676***	0.789***
	(0.247)	(0.323)	(0.217)	(0.279)
EPL collective	-0.182	-0.195	0.236	0.301
	(0.188)	(243)	(0.166)	(0.210)
EPL temporary	0.426**	0.573**	-0.047	0.049
	(0.200)	(0.267)	(0.176)	(0.231)
Unemployment benefits	0.022	0.023	-0.029**	-0.035**
	(0.013)	(0.017)	(0.012)	(0.015)
Period	2008-2009	2009	2008-2009	2009
Wu Hausman test	p= 0.0000	p = 0.0000	p= 0.0040	p = 0.0352
Sargan test	p = 0.9602	p = 0.8941	p = 0.2066	p = 0.1637
Observations	200	100	200	100

Notes: Δ employment (and Δ unemployment, Δ STW take-up) rate is the difference between the employment (and unemployment, short-time work take-up) rate and its average over the year 2007. All other variables are in levels. IV estimates (2SLS). *** statistically significant at the 1 percent level, ** at the 5 percent level, * at the 10 percent level. Standard deviations in brackets.

Table 4 presents the results of the estimations of employment in permanent and temporary jobs. The same instruments are used as before. With these instruments, the assumption that short-time work is exogenous in equation (1), where permanent employment is the dependent variable, is rejected at the 1 percent level of significance as shown by the p-value

[26] We present the estimates with two-stages least squares. Estimations with the GMM method yield similar results.

of the Wu Hausman test in columns 1 and 2 of Table 4. Moreover, the instruments pass the Sargan over-identification test. However, the assumption of exogeneity of short-time work is not rejected when temporary employment is the dependent variable. Accordingly, we present the results of OLS estimations when the dependent variable is the rate of temporary employment.[27] Table 4 shows that the coefficient for short-time work is close to unity for permanent employment, but not significantly different from zero for temporary jobs. This suggests that short-time work is mainly beneficial to permanent workers.[28]

Table 4. Short-time work, permanent employment rate and temporary employment rate

Dependent variable:	**Δ Permanent jobs**		**Δ Temporary jobs**	
	(1)	**(2)**	**(3)**	**(4)**
Δ STW take-up rate	0.795*	0.811**	-0.095	0.122
	(0.416)	(0.335)	(0.082)	(0.091)
EPL regular	0.347**	0.268	0.360***	-0.219
	(161)	(0.241)	(0.129)	(0.166)
EPL collective	0.070	-0.024	0.171*	0.007
	(0.123)	(0.181)	(0.091)	(0.118)
EPL temporary	-0.106	-0.075	0.086	0.097
	(0.131)	(0.199)	(0.078)	(0.105)
Unemployment benefits	-0.021**	-0.027**	-0.019***	-0.005
	(0.009)	(0.013)	(0.007)	(0.009)
Period	2008-2009	2009	2008-2009	2009
Adj. R^2	-	-	0.058	0.002
Wu Hausman test	p= 0.0055	p = 0.0039	-	-
Sargan test	p = 0.2039	p = 0.1348	-	-
Observations	200	100	200	100

Notes: Δ Permanent jobs (and Δ temporary jobs, Δ STW take-up) is the difference between the permanent jobs (and temporary, short-time work take-up) rate and its average over the year 2007. All other variables are in levels. Permanent jobs: IV estimates (2SLS). Temporary jobs: OLS estimates. *** statistically significant at the 1 percent level, ** at the 5 percent level, * at the 10 percent level. Standard deviations in brackets.

[27] 2SLS estimation yields the same coefficient associated with short-time work, which is not significantly different from zero as in the OLS estimation presented in Table 4.

[28] The same finding is obtained by Hijzen and Venn (2010).

4. Conclusion

Recent empirical studies suggest that short-time work programs have been quite successful in the recent downturn in preserving jobs and in keeping down unemployment. Our paper confirms this finding for permanent workers. All in all, it seems that short-time work programs used in the recent downturn had significant beneficial effects. This suggests that countries which do not have short-time compensation programs could benefit from their introduction.

However, special attention should be devoted to the design of these programs. Their impact in the recovery period has not yet been documented. More time is needed. Short-time work programs can induce inefficient reductions in working hours. They can also inefficiently lower the reallocation of jobs toward more productive jobs. To limit these negative effects of short-time work, which may become costly in the long run, two features should be built into their design. First, it is worth introducing experience-rating, which implies that social contributions paid by employers to finance unemployment insurance depend on the costs induced by their participation in short-time work programs. Longer participation in the program should yield higher contribution rates. Second, it is important to commit to *stable* rules, which may be designed under normal economic conditions – and not during recessions – in order to avoid that pressure groups require excessively generous schemes in turbulent periods, which can be difficult to turn off later on. Indeed, persistently high take-up rates can be costly for society as a whole and detrimental to some categories of workers non-eligible for short-time compensation programs.

As a final warning, it should be stressed that much remains to be learnt about the impact of short-time work. There are very few empirical studies devoted to this issue. Empirical evidence about the impact of short-time work in the recent recession is built on macroeconomic data. Macroeconomic evaluations have the advantage of identifying a net global impact of short-time work, including all types of potential effects. But the conclusions of macroeconomic evaluations are necessarily drawn from a relatively small set of observations, which limits the ability to finely identify the impact of programs. Larger sets of observations collected at the firm level would be needed to confirm these conclusions. As

such, controlled experiments would be valuable to avoid the selection bias that could undermine this type of research.

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Comment on Cahuc and Carcillo: Is short-time work a good method to keep unemployment down?

Ann-Sofie Kolm*

Two main messages are put forth by Cahuc and Carcillo. First, there is some empirical support for the fact that short-time work (STW) schemes can preserve jobs and reduce unemployment in downturns. Therefore, countries which have not yet implemented these programs could benefit from doing so. Second, if these programs are implemented, they should include some experience-rating component so as to prevent inefficient reductions in working hours.

I find the study by Cahuc and Carcillo interesting and valuable as it brings new evidence of how STW can affect unemployment in an economic downturn. The paper takes cross-country studies of STW one step further by addressing problems with endogeneity in take-up rates. However, although the study puts forth new valuable evidence of the impact of STW on labour market performance, the last words on the issue are far from having been said. There are simply too few studies available. Moreover, the available studies are based on aggregate cross-country data (see Hijzen and Venn, 2010, Arpaia et al, 2010 and the current study). Thus, there is also a need for well-defined micro-based studies with firm-level data to verify the results found in cross-country studies. Moreover, as STW, in practice, was put into use during the current economic crisis, the available cross-country data only cover the current downturn (so far, there

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is no documentation of the impact of the policy in a recovery period). Thus, what do we know about the long-run consequences of STW?

Assume, as suggested by cross-country evidence, that unemployment does increase by less in a downturn if STW is used. However, is this necessarily good for the long-run economic performance? The rest of this comment discusses potential long-run consequences of this policy

1. Long-run effects of STW

Perhaps job destruction in a downturn is needed in order to improve long-run performance. And what happens in the upturn? Instead of hiring new workers, employed workers are likely to increase their work hours. Thus, one would expect that unemployment falls by less in the upturn than otherwise. Unemployment then varies less over the cycle. But can we expect the equilibrium rate of unemployment to be unaffected by the STW schemes? Moreover, will the speed at which unemployment returns to some normal equilibrium level be reduced by STW schemes?

1.1 Reallocation of jobs

A downturn may work as a necessary first real test for an economy inducing an efficient reallocation of jobs. On the other hand, a downturn may produce an inefficiently high level of job destruction. Short-time work compensation schemes, which moderate the effects of a downturn, could thus potentially have both a positive and a negative impact on long-run economic performance. STW could *improve* the long-run performance of the economy if, for example, productive matches are maintained, if loss of skill is prevented, and if truly productive firms are not forced out of business due to liquidity constraints in a downturn.

On the other hand, STW can *deteriorate* long-run economic performance if workers are locked into inefficient firms which are not closed down. There is thus a trade-off between preventing a waste of productive resources by use of STW schemes, and allowing for a reallocation of jobs by letting firms face the full consequences of a downturn.

As it is à priori difficult to know which effects are the most important for long-run economic performance, it is also difficult to know if it is

optimal for the government to introduce a less than fully experience-rated STW scheme.

1.2 Equilibrium rate of unemployment

How are wage formation and the equilibrium rate of unemployment likely to be affected by STW? One would expect STW policies to increase wage demands, as the schemes tend to favour insiders at the expense of outsiders. If a STW scheme is available for firms in case of a negative demand shock, workers will to a lesser extent view open unemployment as a threat in this situation. Instead, they will face reduced working hours while being fully, or partly, compensated for that. This is likely to lead to increased wage pressure.

In addition, STW schemes may also lead to higher wage demands if the competitiveness of the unemployed is reduced by the policy. As more workers remain in the firms, some which are now on STW schemes, the unemployment pool will to a larger extent contain workers with longer unemployment spells. This tends to reduce the competition for jobs among the unemployed. In fact, these are factors that are likely to cause persistence in the unemployment rate. Although unemployment may be high, this is not fully taken into account in wage bargaining. In the presence of STW, wage-setting insiders know that even if they end up in the unemployment pool, they will mainly compete with long-term unemployed which are seen as less of a threat to their job-finding probabilities.

If STW leads to higher wage pressure for these reasons, the equilibrium rate of unemployment will most likely increase with the policy. However, STW may also have a direct favourable impact on job creation. As STW prevents job destruction by providing firms with an opportunity to maintain workers when hit by a negative shock, it becomes more profitable for firms to open vacancies. The risk of losing workers due to negative demand shocks is simply reduced with STW schemes, which implies that more firms find it worthwhile to look for workers to hire also when times are good. This tends to reduce the equilibrium rate of unemployment (Hedlin and Kolm, 2010).

There is thus a number of potential mechanisms through which STW could affect labour market performance. However, due to the limited number of studies, both theoretically and empirically, it is not clear what

is the impact of STW on the equilibrium rate of unemployment. This highlights the importance of both more theoretical and more empirical research on the impact of STW.

2. Rules or discretion?

Cahuc and Carcillo study the importance of stable rules designed under normal economic conditions. With stable rules, pressure groups pushing for generous STW schemes in turbulent times, which are difficult to eliminate later, can be avoided.

I agree that stables rules are usually preferable. However, with stable rules, it becomes even more important to know the long-run consequences of STW schemes. If STW leads to higher wage pressure, thus causing the equilibrium rate of unemployment to increase, discretionary STW policies may be preferable. If STW schemes are only used in exceptionally deep recessions, they will most likely not lead to higher wage pressure and higher equilibrium unemployment. But, on the other hand, firms anticipating that the government will share some of the risks in downturns by use of STW schemes will find it profitable to open more vacancies also under normal economic conditions. Considering this effect, stable rules are to be preferred to discretion.

3. Conclusions

The question in the title of the paper is: "Is short-time work a good method to keep unemployment down?". Using cross-country data, the authors provide valuable evidence that unemployment will most likely increase by less in downturns if STW schemes are used. However, it is difficult to know how equilibrium unemployment is affected. There are arguments for the fact that STW may increase wage pressure as the schemes tend to favor insiders. This could potentially lead to both higher equilibrium unemployment and persistence of unemployment. Thus, it is not clear that STW schemes improve economic performance.

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What active labor market policy works in a recession?*

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Summary

This paper discusses the case for expanding active labor market policy in recession. We find that there is a reasonable case for relying more heavily on certain kinds of programs. The argument is tied to the varying size of the lock-in effect in boom and recession. If programs with relatively large lock-in effects are ever to be used, they should be used in a downturn. The reason is simply that the cost of forgoing search time is lower in a recession. We also provide new evidence on the relative effectiveness of different kinds of programs over the business cycle. In particular, we compare an on-the-job training scheme with (traditional) labor market training. We find that labor market training is relatively more effective in recession. This result is consistent with our priors since labor market training features relatively large lock-in effects.

Keywords: Active labor market policy, business cycle, unemployment
JEL classification numbers: J08, J64, J68

* We thank Bertil Holmlund and Clas Olsson for helpful comments.

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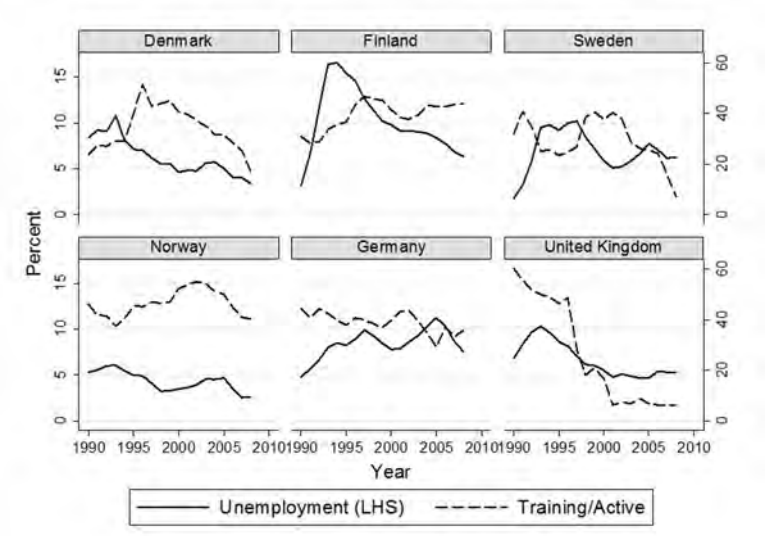
Active labor market policies (ALMPs) have become an integral part of the tool kit for combating unemployment. In 2008, total expenditures on labor market policies amounted to 2.1 percent of GDP in the average OECD country, and 42 percent of the total was devoted to active measures. During 1985-2008, the share of ALMPs in total expenditures increased substantially in continental Europe and the UK, remained constant (and high) in the Nordic countries and was substantially reduced in the US. As a result of these trends, the spending patterns across the OECD countries have become more similar.

Expenditures on ALMPs typically vary with the business cycle, as does any kind of expenditure relating to unemployment. But expenditures on ALMPs relative to overall unemployment expenditures are in fact procyclical: the share devoted to ALMPs increases in a boom. Figure 1 illustrates this fact for a selection of European countries.[1]

Figure 1. Share of expenditure devoted to ALMPs over the business cycle



Source: Official data from each country.

[1] The structure of ALMP expenditure is more difficult to compare across countries for many reasons: all kinds of programs are not available in every country and programs with the same names may have different contents, just to mention two obvious points.

The analysis in this paper provides a discussion of two related questions. First, is there any good reason to vary the spending on ALMPs over the cycle? Second, should different programs be more heavily relied on in different phases of the cycle? Or, to bundle both questions into one: What active labor market policy works in a recession?

This is essentially an empirical question. However, evidence on this important question is extremely scant. So rather than providing concrete policy advice based firmly on the evidence, we try to identify the crucial policy considerations and discuss to what extent the general evidence on the efficacy of ALMPs applies to the question at hand.

The paper proceeds as follows. Section 2 sets the stage by illustrating how we think about ALMP and introducing some concepts that we use later on. Section 3 discusses the positive question of why we might expect ALMPs to have different effects across the business cycle. In Section 4 we raise the normative question of why it might be optimal to adjust ALMPs in response to the business cycle and whether certain kinds of ALMPs should be preferable to others. The question of whether the efficacy of a given ALMP varies with the business cycle constitutes a very difficult evaluation problem. In Section 5 we make this evaluation problem more precise.

The remaining sections are devoted to the evidence. We begin by analyzing the nature of a recession in Section 6. Among other things, we characterize the extent to which recessions should be thought of as cyclical or structural shocks and describe the changes in the composition of individuals who lost their jobs in different states of the labor market. We also examine if the composition of participants in ALMP changes with the business cycle. Section 7 turns to the evaluation evidence: We present evidence that directly relates to the question at hand and discuss what we can infer from other types of evidence.

Since the evidence which is directly relevant is so scant, we devote Section 8 to an empirical example. Specifically, we provide evidence on the relative efficacy in boom and recession of two Swedish labor market programs that have both been used fairly extensively: an on-the-job training scheme (*arbetspraktik*) and vocational training programs (*arbetsmarknadsutbildning)*. To identify the effects of the cycle, we use the variation in unemployment rates within local labor markets over time. This enables us to abstract from institutional changes affecting both programs,

since they are common across regions. This is an improvement relative to the previous literature. Section 9 concludes the paper.

Before turning to the analysis let us mention some limitations. We solely focus on an efficiency argument for expanding (various forms of) ALMPs in a recession. To be more precise, we only discuss whether certain kinds of policies are more beneficial in a recession because they improve the earnings potential of the participating individuals. Thus, we do not discuss purely distributional arguments for using ALMPs (if one is concerned with distributional issues it seems more efficient to instead use targeted cash transfers). Neither do we discuss arguments relating to the possibility that firms may shed too much labor in a recession. Nor do we discuss general equilibrium effects of ALMPs. Finally, we ignore the fact that ALMPs may improve the targeting of UI. The latter issue is discussed in Fredriksson and Holmlund (2006). The upshot of their analysis is that it is better to use a monitoring scheme or a time-limit on UI benefits rather than a time-consuming labor market program to improve the targeting of UI.

A final remark is that all our own emirical analysis is based on Swedish data. We do not expect this to have any implications for the generality of the analysis. After all, practically all OECD countries make extensive use of ALMPs today.

1. Preliminaries

Before probing deeper into the analysis, it is useful to make clear what we mean by active labor market policies and define some concepts we will use later on.

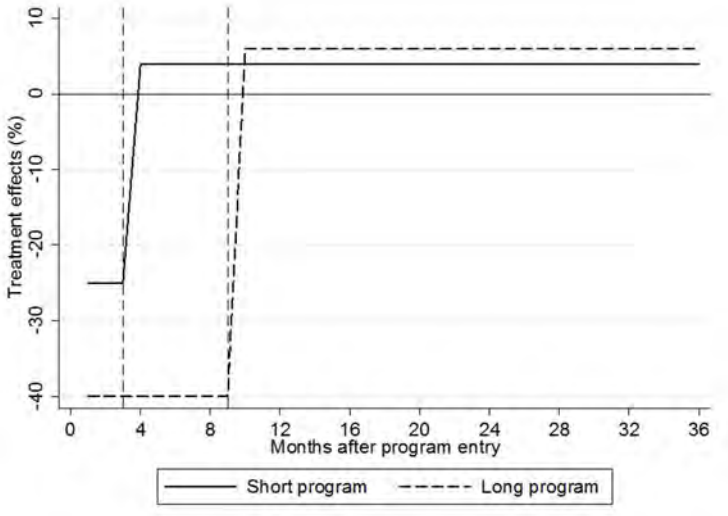
Unemployment is typically an eligibility condition for participation in an ALMP. While this is not true everywhere, it is generally the case that participants should be searching for a job in order to take part in an active measure. We think it is useful to distinguish policies by the different time investments they require on the part of workers. Those requiring a non-negligible time investment will be referred to as “programs”. Other policies – for instance job search assistance (JSA) and counseling and monitoring – generally require substantially smaller amounts of time investment.

Programs are analogous to schooling. They are investments in current time and money for a future increase in earnings. The clearest analogy, of course, pertains to labor market training. But we would also like to think of subsidized employment in this way, i.e. as investment in on-the-job training which may increase the chances of the participants on the regular (unsubsidized) market.

While pursuing an investment activity you are forgoing something. In this case, you are forgoing time that could have been used to search for a regular job, and thereby increasing the probability of finding one.

The effects of treatment are fundamentally different while taking part in the program and after program completion. Figure 2 graphs two examples of hypothetical treatment effects for a given set of individuals.

Figure 2. Two hypothetical profiles of treatment effects



The two programs differ in terms of intensity. The intensive program has a planned duration of nine months while the less intensive one is planned to last for three months. The intensity of the program is also reflected in the fact that the intensive one is assumed to have bigger ”lock-in” effects than the less intensive one. After program completion, "the

post-program" effects for the intensive program are uniformly larger compared to the less intensive one.

The first stage of the evaluation is to determine whether the sequence of treatment effects observed *after program entry* is positive. In a second stage of the analysis, one would like to compare the net benefit to other costs of running the program – this cost-benefit analysis is rarely done, however.

We provide the illustration in Figure 2 to make it clear how we think the treatment effects should be estimated. Having said this, it should be noted that this is not how it is always done in the literature. Some researchers only examine the post-program effects, and consider these as the "only" treatment effects. We find this approach strange and it answers an ill-posed question (it would be like calculating the return to schooling, ignoring the investment period).

Another reason for showing the example in Figure 2 is that we want to use the terminology we have introduced later on. Therefore, we will use lock-in effects to refer to the treatment effects while taking part in the program, and post-program effects to refer to the treatment effects after program completion.

2. Why would treatment effects vary with the cycle?

The clearest argument for why the treatment effects vary with the business cycle relates to the lock-in effects. The lock-in effect should be smaller in a downturn. Intuitively, it is easy to see that if program participants do not search at all, then a downturn only affects the alternative to treatment (i.e. job search) and thus the lock-in effect is reduced in a recession. More generally, the lock-in effect is smaller in recession if individual search effort and the state of the labor market have complementary effects on the probability of finding a job.[2]

It is more difficult to have a definitive prior regarding the post-program effects. Nevertheless, an intuitive argument is based on "scarring" (i.e. the fact that exposure to unemployment at the time of labor

[2] Complementarity simply means that the job offer arrival rate is increasing in search effort holding the business cycle constant. Conversely, a given search effort produces more job offers in a booming labor market than in a depressed labor market.

market entry has negative consequences for future earnings; e.g. Ellwood 1982). For those who do not enter the program in a recession, the bad state of the labor market will influence their earnings prospects with certainty. Those who enter a program, however, enter the labor market at some future time point. Chances are that the economy has turned for the better, in which case their employment prospects will not be hurt as much as for those who did not enter treatment.

Other arguments for why average treatment effects vary with the cycle are related to heterogeneous effects. Such treatment heterogeneity may provide an efficiency argument for an expansion of program activity in a recession. Therefore, we relegate a discussion of these arguments to the next section.

3. Why should ALMPs vary with the cycle?

Positive treatment effects are in themselves no argument for subsidizing ALMP – some market failure is required. If the unemployed face credit constraints, it is optimal to provide public insurance. If unemployment implies skill loss, an optimal policy package will typically involve ALMP; see Wunsch (2010). Thus, the combination of credit constraints and skill loss provides an efficiency argument for having ALMPs in general. The questions we raise here is if there is a case for expanding program activity in general during recession and whether certain kinds of policies are more beneficial than others.

3.1 The general case

In a labor market where it is optimal to provide public insurance, individual search decisions are distorted. In particular, individual search effort is too low from society's point of view (see Fredriksson and Holmlund, 2001). The reason is that there is an "externality" working through the public budget. If everyone were to search a bit more, employment would increase; with higher employment, taxes can be lowered which represents a gain for everyone. This general equilibrium effect is not taken into account by the individual agent, and hence represents an externality.

The marginal cost to society of this distortion is likely to be higher in a booming labor market. The complementary effects of search effort and the state of the labor market on the probability of finding a job are key to this result. If this is the case, then a reduction of search intensity by a given amount decreases employment more in boom than in recession.

Andersen and Svarer (2009) have recently made this point in relation to the question of whether unemployment benefits should be made more generous in a recession. Their answer is "yes" (provided that the balanced budget requirement applies across states of nature) and the reason is precisely the one given above.

As argued earlier, the typical active labor market program involves an investment activity which is completely analogous to investment in education. Since participation in such programs is a time-consuming activity, programs distort the incentives to search, which is also a time-consuming activity (there is ample evidence that there are lock-in effects associated with program participation; see, e.g. van Ours, 2004 and evidence on the search behavior of program participants in Ackum Agell, 1996 or Regnér and Wadensjö, 1999). The costs of such distortions are smaller in a recession, which provides one rationale for increasing program activity during a recession.

A crucial issue is to what extent recessions involve structural shocks, rendering worker skills obsolete. If the prevalence of such structural shocks is greater in recession than in boom, this is another rationale for increasing program activity during a recession, since programs, at least to some extent, offer retraining to workers.

3.2 Relative efficiency of different kind of programs

Active labor market policy comprises many forms of activities, not just "programs". Some policies do not involve a time investment at all. Moreover, different programs distort search incentives to a varying degree. Therefore, intuition suggests that different kinds of ALMPs should be used more extensively in a downturn.

Job search assistance and monitoring of search behavior are two examples of policies that involve marginal investments in time. Job search assistance presumably raises the efficiency of search and monitoring increases the individual return to search for each unit of time that the

individual searches for a job. Intuition would suggest that these kinds of ALMPs should be used more extensively in a boom than in a recession.

For the programs involving different extents of time investments, there is arguably a case for using the most intensive programs in a recession. Thus, one would think that training programs which have larger lock-in effects are relatively more efficient in a downturn than programs that are more intimately linked to the labor market.

Another aspect of program heterogeneity involves the timing of ALMPs. A given program may have differential effects depending on when (in an unemployment spell) an individual enters. A couple of recent papers (Spinnewijn, 2010; Wunsch, 2010) have analyzed the issue of when the programs should be offered in an unemployment spell. It turns out that the answer depends on the nature of skill loss associated with job loss and unemployment. If job loss in itself involves substantial skill loss relative to the gradual skill loss occurring over the course of unemployment, then it is better to target individuals early on in the spell. One crucial question is then whether recessions and displacement have significant structural components. We discuss this question in Section 6.

4. The evaluation problem

Treatment effects are likely to vary across individuals, i.e. they are heterogeneous. This heterogeneity presumably applies to the observable as well as the unobservable dimension.

An evaluation amounts to estimating actual and counterfactual outcomes for a given program and a given set of individuals who are eligible for a program. To examine whether the effects of ALMP vary with the business cycle, treatment effects must be compared over time. Such comparisons raise several issues:

- Is it the same program?
- Do eligibility or selection rules change?
- Does the population of eligible individuals change over time?

Regarding the first point, there may be changes in the fine details of the program even though the name of the intervention stays the same.

Consider occupational retraining, for instance. At various points in time, the Public Employment Service (PES) may decide to offer retraining for different occupations depending on what it thinks is in high demand. Retraining for different occupations implies that there is variation both in the content of the program and presumably also the length of the program. Since both content and length are likely to affect the size of the treatment effect, the effect for the overall program – occupational retraining – is likely to vary even though the treatment effect for each individual occupation stays the same.

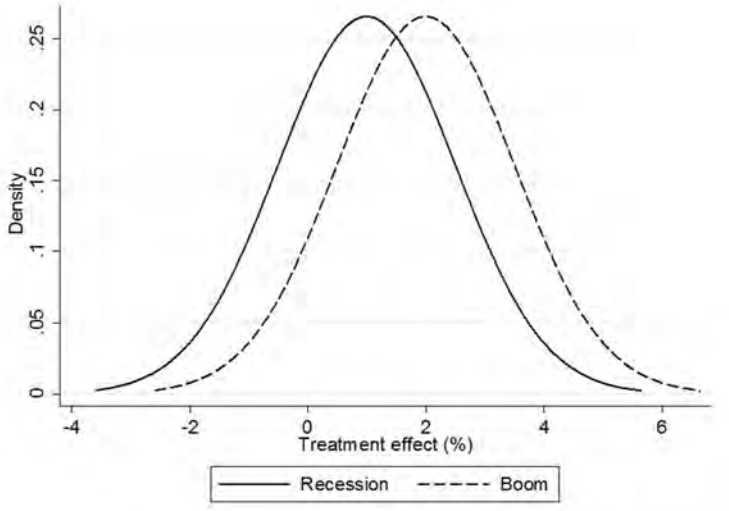
The second point refers to the overall institutional rules that govern eligibility and selection. For instance, at one point in time, a given program may only cater for unemployment insurance recipients, at other points in time the entire population registered at the PES office may be eligible for the program.

Institutional rules may also affect selection into the program – both self-selection on the part of individuals and PES selection rules. For instance, the introduction of performance criteria may cause PES officers to select different sets of individuals. One example of such performance criteria pertain to labor market training in Sweden. In 1999, a new target was introduced: three months after program completion at least 70 percent of the participants should be employed. This reform arguably changed the incentives in favor of enrolling individuals with relatively good employment prospects with and without the program. Another example (from Sweden) of changes in institutional rules pertains to the relationship between UI eligibility and program participation. Prior to 2001, program participation could be used to renew UI eligibility. During 2001 this opportunity was abolished. Such changes clearly affect incentives and, hence, the selection of individuals into the program.

Even if the first and second points are not a concern, the population of eligibles (who are usually the unemployed) may change over time. This will affect the size of the average treatment effects if there is treatment heterogeneity. Treatment heterogeneity may occur in the observed and unobserved dimension. Figure 3 illustrates a hypothetical example. It graphs the distribution of treatment effects for individuals who are unemployed in boom (dashed) and recession (solid). In Figure 3, we have assumed that in a recession the distribution is skewed towards those who

have less to gain from the program.[3] This will give the impression of a smaller average treatment effect in recession, even though there is no variation in the effects of treatment at the individual level.

Figure 3. The distribution of treatment effects in boom and recession



To make matters even more difficult, there may be true (as opposed to spurious) duration dependence. With duration dependence, individuals become dissimilar even though they were identical at the start of the spell. This complicates the evaluation problem if there is variation in the duration until the program start. If the treatment effects vary systematically with the timing of the intervention, the estimates may differ across the cycle even though there is really no difference.

It is useful to ask the question: Would a series of experiments (or quasi-experiments) run at different points in the business cycle help us solve the evaluation problem? The short answer is that they would, if treatment effects are homogenous. But if there is treatment heterogeneity along the

[3] This is consistent with the results in de Luna et al. (2008), where it was found that the treatment effect of training programs was decreasing in the level of education. In Section 6.2, we show that job losers in recession are drawn from the higher end of the wage distribution to a greater extent than job losers in boom, so that job losers in terms of observed *and* unobserved characteristics are drawn from a higher end of the distribution in recession than in boom.

lines shown in Figure 3, we must impose additional assumptions in order to solve the evaluation problem.

To see this, note that experiments provide internally valid estimates, i.e. they estimate the mean causal impact for the population studied. With treatment heterogeneity, however, the results do not extend to another population, i.e. they are not externally valid. If the observed and unobserved characteristics of the eligible population vary with the state of the labor market, it is, in general, not possible to extrapolate the results from one time point to another.

When would the variation in experimental estimates across the cycle have a causal interpretation? One would have to assume that treatment heterogeneity is only in the observed dimension. Under this assumption, it is straightforward to adjust the estimates to take the variation in the distribution of observed characteristics across the state of the business cycle into account. But in the general case with treatment heterogeneity also in the unobserved dimension, the adjustment in terms of observed characteristics only provides unbiased estimates under a "selection-on-observables" assumption (this assumption is sometimes referred to as the conditional independence assumption). This assumption effectively says that it is sufficient to control for observed characteristics to obtain unbiased estimates of the treatment effect.

But if you are forced to make a selection-on-observables assumption to interpret the variation in the experimental estimates across the states of the business cycle, it seems equally valid (and certainly more feasible) to base the entire analysis on this assumption. In short, the value added of experiments is more limited than usual for the question at hand.

Whether the selection on observables assumption is credible or not crucially depends on the richness of the information in the data used for the analysis. In recent years, administrative data sets containing, e.g. earnings and unemployment histories prior to program participation have become available. The availability of these data sets seems to have reduced the potential bias associated with the selection-on-observables assumption. Indeed, a recent meta analysis by Card et al. (2009) suggests that the qualitative conclusions do not differ systematically between experimental and non-experimental approaches.

5. The anatomy of a recession

Recessions are not just cyclical shocks. They may involve a significant amount of structural adjustment. If recessions involve more structural adjustment than the on-going secular adjustment in a normal state of the labor market, then this has an effect on the optimal timing of ALMPs as argued above.

A further issue is that different kinds of individuals are likely to lose their job in a recession than in other labor market states. This has (at least) two implications. First, if different kinds of individuals lose their jobs in a recession, this substantially complicates the evaluation problem; the reason is that individuals differ in a number of respects, not only in the dimensions we can typically observe in the data. Second, if there are heterogeneous effects of ALMPs, and different individuals become unemployed in a recession, this has implications for the appropriate mix of ALMPs.

In this section, we use Swedish data to address these issues.

5.1 To what extent do recessions involve structural shocks?

We have used the OECD composite leading indicator to identify Swedish business cycle peaks and troughs in the 1990s and 2000s. Looking at employment by industry, we have then classified employment changes as cyclical or structural depending on employment changes before and after peaks or troughs. More specifically, we classify sectors where employment either grows or contracts both before and after a certain time point as sectors that undergo structural change (see Groshen and Potter, 2003) for a discussion of this approach). Using this way of classifying sectors in terms of structural change we then calculate the share of employment in sectors with structural change for peaks and troughs in the 1990s and 2000s. These results are presented in Table 1.

According to Table 1, the recession at the beginning of the 1990s involved more structural adjustment than the boom that preceded the recession. However, for the peaks and troughs occurring at the beginning of the 2000s, the opposite is true. On average, there thus seems to be about as much structural change in boom as in recession. At least there are no clear indications that structural change is concentrated to recessions.

The main message of Table 1 is that it is difficult *ex ante* to determine from the business cycle position whether aggregate job losses are cyclical or structural. The targeting of labor market programs should arguably instead be based on predicted individual risks.

Table 1. Share (%) of total employment in sectors with structural change

	Beginning of 1990s Date (month) of peak/trough	Beginning of 2000s Date (month) of peak/trough
Boom	40.6 (1990:2)	75.5 (2000:9)
Recession	50.8 (1993:4)	32.7 (2003:2)

Note: Computations based on industry employment according to the Labor Force Surveys (44 industries). The employment growth rate in each industry is measured relative to the national average growth rate.

5.2 Who loses the job in a recession?

Here the purpose is to characterize the skills of individuals who lose their jobs in a recession. We follow Juhn et al. (1991) in using wages as a summary measure of skills. We further decompose wages into a part explained by standard observed characteristics and an unexplained part.

We have chosen the year 1992 to represent recession and the year 2005 for boom.[4] Hence, we identify individuals who were employed in 1991 and entered unemployment in 1992 as individuals who lost their job in a recession;[5] those who were employed in 2004 and entered unemployment during 2005 lost their job in a boom. The question we are asking is whether the distributions of observed and unobserved skills are different over periods of boom and recession.

[4] One may discuss the choice of 2005 to represent a boom year. Nevertheless, we think this choice is entirely innocuous. The important point is that the state of the business cycle is much better in 2005 than in 1992. According to the OECD composite leading indicator, a sustained business cycle expansion started in February 2005 which peaked in January 2008. For the analysis conducted here, 2006 or 2007 would perhaps have been more natural choices. The reason for choosing 2005 rather than 2006 or 2007 is that we characterize selection into labor market programs during boom and recession later on. For that analysis, the change in government in 2006 constitutes a problem. Along with the change of government came a major restructuring of labor market policy. Therefore, we think it is better to use 2005 rather than the later years since the analysis may otherwise be contaminated by the "structural change" of ALMP.

[5] Data on unemployment entry come from the registers of the National Labor Market Board. It should be clear that individuals may have left employment for other reasons than having been laid off.

Figure 4 plots the density of the job loss distribution by age and wage percentile for men, while Figure 5 presents an analogous plot for women. The solid lines relate the job loss to skills in *recession*, while the dashed lines pertain to *boom*.

Figure 4. Job loss by wage percentile in boom and recession, men

Source: Calculations based on the unemployment register and the wage register (*strukturlönestatistiken*).

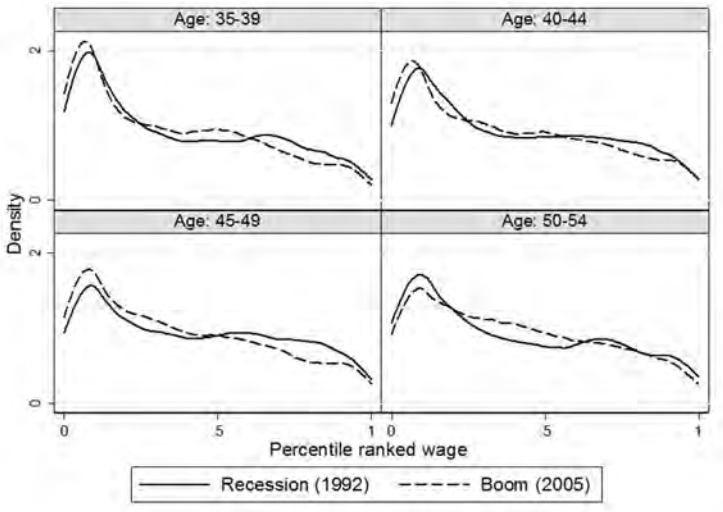
Job losers in recession are drawn from the higher end of the wage distribution to a greater extent than job losers in boom.[6] This pattern is most pronounced for older men. At lower ages, the picture is probably distorted by the fact that employment security legislation (last in – first out) interacts with age and the business cycle. The pattern that individuals at the higher end of the wage distribution are hit relatively harder is less clear-cut for females. A possible explanation is that this reflects the larger employment share for females in the public sector but, due to data limitations, we have not been able to examine this thoroughly.

When decomposing skills into observed and unobserved ones (not shown here), we note that much of the pattern for men is driven by the

[6] Interestingly, Mueller (2010) presents similar evidence for the US.

residual wage distribution, i.e., by unobserved skills.[7] This may be a warning against too much reliance on estimated treatment effects using models where identification relies on selection on observed characteristics (such as e.g. matching models) – the characteristics of job losers change over the cycle and a non-negligible part of this is driven by unobserved characteristics.[8]

Figure 5. Job loss by wage percentile in boom and recession, women



Source: Calculations based on the unemployment register and the wage register (*strukturlönestatistiken*).

5.3 Program activity and the timing of interventions over the cycle

Here we examine two questions. The first question is whether the characteristics of program participants change with the cycle. The second question is how the probability of entering a program varies by elapsed duration over the cycle.

Regarding the first question, there are several reasons to suspect that the characteristics of participants vary with the cycle. First of all, the skill

[7] As the measure of observed skills we use predicted wages. Predicted wages are generated from a standard wage regression (run separately by gender), where log wages are explained by a fourth-order polynomial in age, education, immigrant status and years since migration.

[8] Perhaps one should not be overly alarmed. Using the typical register data set, the analysis can be conditioned on wages and earnings prior to program entry.

composition of the eligible population changes in a recession, as demonstrated in the previous section. Second, if there are capacity constraints, recessions imply more competition for the available program slots.

Skedinger (2010) examined if the skill composition of program participants varies with the cycle. He regressed, inter alia, the share of low-educated in programs on unemployment, holding constant the share of low-educated among all individuals who are at risk of participating in a program.[9] He performed the analysis on monthly aggregate data including seasonal fixed effects in the analysis. Table 2 reproduces a sub-set of the results from his analysis.

Table 2. Cyclical variation in the relative risk for low-educated of participating in ALMPs

Dependent variable: Share of low-educated in programs				
	Overall	**LMT**	**JSA**	**Subsidized jobs**
Unemployment	-0.86	-0.89	-1.52	0.66
	(4.68)	(3.94)	(3.11)	(2.77)

Source: Skedinger (2010).

Notes: Monthly data 1996:01-2009:11. The regressions include seasonal FEs and the share of low-ed. among the eligible. t-ratios in parentheses.

The first column of Table 2 illustrates that if the unemployment rate increases by 1 percentage point, the relative risk that the low-educated (those with compulsory education or less) participate in a program decreases by -0.86 percentage points. When decomposing the overall effect into separate effects for different kinds of programs, he found that this conclusion applied to labor market training (LMT; see col. 2) and job search assistance (JSA; see col. 3) but not to subsidized jobs (col. 4). Thus, the increasing number of high-educated in a recession to some extent crowds out the low-educated. Lechner and Wunsch (2009) presented similar evidence for Germany.

Skedinger (2010) conducted the same analysis for other characteristics. In short, he found that youths are more likely to participate in a program during recession, that the participation rates of refugee immigrants are unrelated to the cycle, and that the relative risk of participating in a

[9] Since being recorded as unemployed is a pre-condition for participating in a program, he controlled for the share of low-educated in the unemployment register.

program decreases in a recession for individuals with: (i) a work impairment; and (ii) more than two years of unemployment.

Table 3. Determinants of ALMP participation in boom and recession

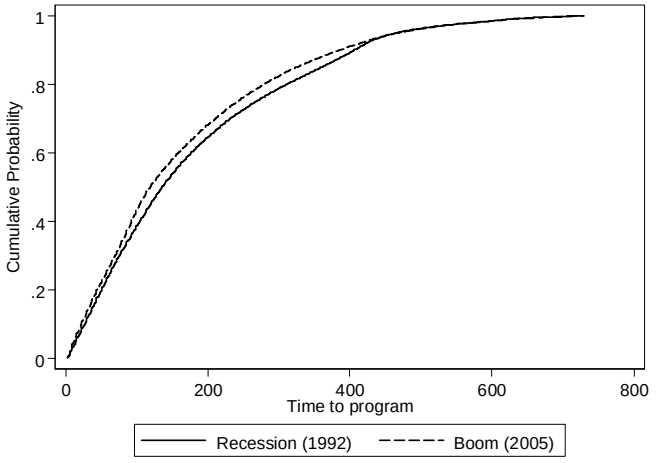
Variables	(1) Recession (1992)	(2) Boom (2005)	(3) Difference: (1) - (2)
Less than upper-secondary education	-0.11** (0.0053)	0.0051 (0.0087)	-0.11** (0.010)
Immigrant	-0.061** (0.0065)	-0.0042 (0.0082)	-0.057** (0.010)
Age 20-29	0.37** (0.0051)	0.13** (0.0077)	0.24** (0.0092)
Age 55+	-0.87** (0.014)	-0.28** (0.015)	-0.59** (0.020)
Child under 10	-0.062** (0.0054)	0.046** (0.0084)	-0.11** (0.010)
Male	-0.072** (0.0046)	0.13** (0.0071)	-0.20** (0.0084)
Married	-0.033** (0.0059)	0.00086 (0.0088)	-0.033** (0.011)
Outside big cities	0.40** (0.0066)	0.63** (0.011)	-0.23** (0.013)
Observations	572,716	522,714	1,095,430

Notes: The results are generated using Cox regressions on data from the Swedish unemployment register. The analysis only includes individuals aged 20-60. Standard errors in parentheses: ** $p<0.01$, * $p<0.05$.

We have used micro data to revisit this issue. The advantage of using micro data is that we can control for a (potentially large) number of characteristics simultaneously to isolate the unique contribution from each of the characteristics. The results of Cox regressions for hazards to all programs in boom and recession are shown in Table 3.[10]

[10] The Cox regression models the flow (hazard rate) to programs as the product of a baseline hazard $h_0(t)$ and a part that depends on characteristics $X: h_i(t) = h_0(t)e^{X\beta}$, where β denotes (a vector of) parameters to be estimated. An estimate of -0.06 on (say) immigrant status means that it is six percent less likely that an immigrant will enter a program (per unit of time) relative to an individual born in Sweden. Note that this interpretation is based on the common practice of approximating relative changes with log changes. For sizable estimates, the relative change should be calculated as: $e^{\beta} - 1$.

Figure 6. Cumulative distribution functions for time to program in a boom and in a recession



Source: Calculations based on the Swedish unemployment register using individuals aged 20-60.

By and large, the micro data convey the same message as the analysis in Skedinger (2010); the only substantive difference pertains to immigrants. On the one hand, the program hazards are significantly lower in recessions for those with less than high-school education, immigrants, and individuals aged 55-60 (relative to individuals aged 30-44). On the other hand, the probability of entering a program is higher in recession for young individuals. To take an example of the magnitudes involved, the estimates indicate that the program hazard for those with less than upper-secondary education is (roughly) 11 percent lower in recession than in boom.

In Figure 6 we present cumulative distribution functions for time until program entry in boom (2005) and recession (1992) for those who actually enter a program. Since the probability of having started the program before a certain time point is always higher in boom than in recession, the figure implies that individuals enter programs earlier in an unemployment spell in a good state of the business cycle.

6. The evidence

To what extent do the effects of ALMP vary with the business cycle? As we have repeatedly emphasized, there is not so much evidence that directly pertains to the question we are interested in. Notice that the policy-relevant question relates to the state of the labor market *at the time of program start*. A few papers (Johansson, 2001; Raaum et al., 2002) have examined whether the state of the labor market at the time of measuring outcomes is of importance. Although this might be an interesting issue, it is less clear why policy makers should be concerned with that question.

6.1 Direct evidence on the efficacy of ALMPs over the cycle

Lechner and Wunsch (2009) is the only paper that has directly addressed the question in which we are interested. The lack of research on this issue is presumably not driven by lack of interest – the question is certainly highly policy relevant. Rather, we think that the lack of evidence is driven by the fact that this is a hard evaluation problem (see Section 5) and the fact that extraordinary data are required; in particular, the time dimension of the data should cover both boom and recession. Given that Lechner and Wunsch's paper is the only one available, we spend some time on it.

Lechner and Wunsch considered training in (West) Germany. The treated population may have entered training at some time point between 1986 and 1995. Labor market outcomes are observed until 2003. Their analysis is based on a selection-on-observables assumption (there is presumably no other alternative).

They estimate short-run program effects (outcomes observed six months after program entry) and long-run effects (outcomes observed eight years after program entry). The short-run effects primarily capture the lock-in effects of program participation.

Lechner and Wunsch found that, on average, program participation reduced the employment probability by 15 percentage points in the short run and increased the employment probability by 10 percentage points in the long run. Cumulated over the eight years that outcomes can be observed (which is arguably the most relevant metric), the estimates imply a relative increase in months of employment by five percent.

The main point of the Lechner and Wunsch paper is, however, to correlate the estimated treatment effects with the unemployment rate at program entry. Table 4 reproduces their baseline results. They suggest that when unemployment at the time of program entry is high: (i) lock-in effects are less negative; and (ii) long-run effects are more positive.

Table 4. Correlations between program effects and unemployment rate at program entry

	Correlation with unemployment at program entry
Short-run effect (6 mths.)	0.25*
Long-run effect (8 yrs.)	0.31**

Source: Lechner and Wunsch (2009).

Note: Dependent variable: Program effects (outcome: employment). * = significant at 5 % level; ** = significant at 1 % level.

The Lechner-Wunsch estimates are potentially plagued by (at least) two problems. First, the skill composition of program participants changes with the cycle: in Germany, participants tend to be more positively selected in a downturn. Second, "training" is a heterogeneous group of programs: the composition may change over the cycle as might the planned duration of a given program. Lechner and Wunsch found that these two problems raise no concerns. The correlations with the unemployment rate at program entry do no change much when the characteristics of the participants and the composition of training programs are held constant.

What are the caveats to Lechner and Wunsch (2009)? One obvious caveat is that this is only one study of a single program for a single country. Naturally, this is too little empirical evidence to base definitive conclusions on. Nevertheless, we see no obvious reason for thinking that the correlation between unemployment and the effects of training in Germany should be different from other countries. However, we are reluctant to extrapolate from training to other forms of ALMP. The best case for expanding ALMP is probably labor market training.

But there are also aspects of the Lechner and Wunsch study that could be improved upon. A maintained assumption in their study is that there are no changes in the institutional set-up for training during 1986-95. But this is argued rather than shown, and it is not possible for us to assess whether the assumption is credible. In this respect, it would have been

preferable to examine if treatment effects vary systematically with changes in unemployment within regions over time. The virtue of this approach is that one can abstract from institutional changes since they are common across regions (at least in centralized systems such as the Nordic ones).

Another maintained assumption is that there is no (or irrelevant) variation in the duration until program start. Programs on average start later in a recession (see the evidence in Section 5.3). Because of capacity constraints, there is some "weeding-out" of the unemployment pool. This is a concern since duration dependence implies that individuals become different even though they were identical to begin with. It is straightforward to adjust for the differences in the duration until program start across the cycle; however; after all the duration until program start is observed (see Fredriksson and Johansson 2008).

In principle, one could also raise some concerns about the selection-on-observables assumption. This critique, however, seems rather moot since there is no other alternative in practice (see Section 4).

6.2 Other (related) evidence

Given the lack of directly relevant evidence, it is reasonable to look for other evidence that can shed some light on the issue. A meta-study by Kluve (2010) indicates that the average rate of unemployment during the program spell does not interact significantly with overall program effectiveness. However, there is a positive interaction with the effect of labor market training, suggesting that labor market training is more effective in a downturn. Since a meta-analysis just pools together different estimates from different studies, it is not possible to adjust for changes in the composition of participants and programs over the cycle.

A few papers correlate treatment effects with unemployment at the time of measuring outcomes. The paper by Raaum et al (2002), for instance, found worse effects of labor market training when unemployment is high. But this finding has unclear implications for policy design.

A relevant issue is whether there are more individuals who would benefit from a program in a slump. This relates to the question of heterogeneous treatment effects. But there is fairly limited systematic evidence on such heterogeneous effects. A general conclusion, however, is that programs do not benefit youths to the same extent as older age categories

(see Card et al., 2009). Moreover, there is some limited evidence that low-educated and immigrants have more to gain from training (e.g., de Luna et al., 2008). Taken at face value, these two results suggest that the variation in the characteristics of program participants that we observe over the cycle in Sweden is not optimal.

If the rate of skill obsolescence is higher in recession, there are indeed more individuals who benefit from a program in a downturn. On basis of the evidence we presented in Section 5.1, there is no such general pattern.

Finally, another kind of related evidence is presented in Schmieder et al. (2009), where it is found that the changes in the generosity of unemployment insurance have very similar effects in boom and recession. This may indicate that we should not expect a very large difference between lock-in effects in different phases of the cycle.

7. An application for Sweden

Here, we provide new evidence on the effects of ALMPs over the business cycle. More specifically, we compare the effects of a Swedish on-the-job training scheme (*arbetspraktik*) to the effects of labor market training (*LMT*) over the cycle. The on-the-job training scheme, which we will refer to as work practice (*WP*), has been used fairly extensively in both boom and recession. In our most sophisticated regressions, we identify the effects of the cycle using the variation within local labor markets over time and adjust the estimates for differences in the timing of the start of the program. We thus address two points of criticism that can be levied on the study by Lechner and Wunsch (2009).

There are three main reasons for comparing the treatment effects of two programs (instead of estimating the treatment effect of one program relative to non-participation). First, we believe that selection on observed characteristics (or conditional independence) is a more credible assumption when comparing the two programs. Second, by comparing two programs, we take account of factors affecting all programs that correlate with the regional unemployment rate. Third, the relative comparison answers the highly policy relevant question: What kind of program – the on-the-job training scheme or the labor market training scheme – is more effective in a downturn?

Table 5. The efficiency of Work Practice (*WP*) relative to Labor Market Training

Variables	(1) General effect	(2) + by cycle	(3) + by year and county	(4) + by time to program start	(5) + by individual characteristic
WP	0.25**	0.25**	0.18**	0.14**	0.29**
	(0.012)	(0.012)	(0.043)	(0.046)	(0.090)
WP × *T* > 100	-0.45**	-0.45**	-0.082	-0.10*	-0.35**
	(0.014)	(0.014)	(0.049)	(0.053)	(0.099)
WP × (regional *u*)		-0.015**	-0.0038	-0.029*	-0.030*
		(0.0042)	(0.012)	(0.013)	(0.013)
WP × *T* > 100 × (regional *u*)		-0.0027	0.016	0.0086	0.0053
		(0.0054)	(0.016)	(0.016)	(0.016)
Observations	163 422	163 422	163 422	163 422	163 422

Note: The estimates are based on Swedish data during 1999-2005. Regional unemployment is measured at the county level and corresponds to the unemployment rate during the month when the program started. Regional unemployment rates are deviations from the mean unemployment level during the observation period, so that main effects can be interpreted as the mean effect at mean unemployment. Standard errors in parentheses: ** p<0.01, * p<0.05. The outcome variable is the hazard rate out of unemployment.

We first perform one-to-one propensity score matching of treated (*WP*) and comparison individuals (*LMT*) on year of inflow and duration of unemployment spell before program entry as well as a battery of covariates.[11] We use individuals aged 25-55 and consider programs that start within the first year of unemployment.[12] Under conditional independence, we can use the matched treatment and control group to make a straightforward comparison of the two programs. To this end, we compare the hazard rates out unemployment by estimating a Cox regression model where we allow the treatment effects to vary by time since program entry (100 days).[13] Column (1) in Table 4 presents the estimates from this exercise. The idea is that any lock-in effects will mainly be occurring during the first 100 days, while any post-program effects will

[11] The covariates include gender, age, level of education, country of origin, if the unemployed is willing to accept part-time employment, citizenship, region and previous unemployment (number of days and number of unemployment spells during each of the four years before the start of the unemployment spell).

[12] We consider open unemployment and time in any labor market program as unemployment. Temporary employment and part-time employment that last more than 30 days are considered as employment.

[13] We present Cox regression estimates since they allow us to summarize the relative effects in two coefficients. We have also estimated the relative effects on the survival rates. It produces similar patterns.

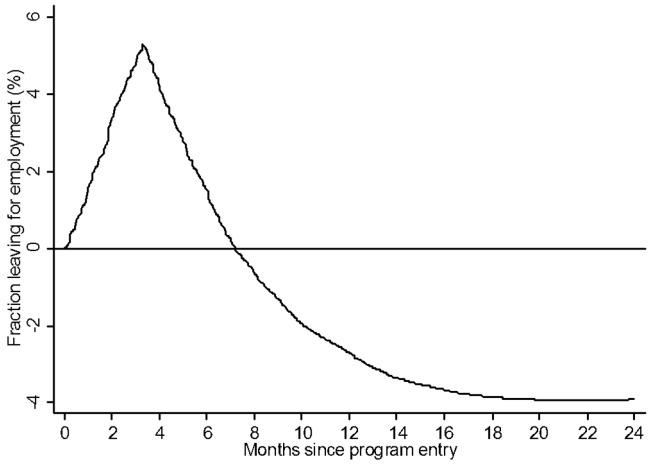
mainly occur after the first 100 days. If so, the relative size of the lock-in effects will be captured by the estimate of the main effect (denoted *WP*), while the relative size of the post-program effects will be captured by the sum of the coefficients on the main effect and the interaction term ($WP \times T > 100$).

Using these two estimates, one can also get a sense of the relative size of the total effect (the sum of lock-in effects and post-program effects) over some time horizon. The two estimates imply that training outperforms work practice in the longer run, because the post-program effect will eventually outweigh the estimated lock-in effect. Indeed, the survivor functions implied by column (1) suggest that the probability of remaining in unemployment is lower for *LMT* than *WP* for evaluation horizons that extend beyond 7 months (218 days) after program entry. This is shown in Figure 7, which plots the relative probability of leaving unemployment for employment (computed as the difference between the survivor functions for the two programs). Alternatively, one can calculate the relative effect on unemployment duration: *LMT* reduces unemployment duration for evaluation horizons beyond 15 months (464 days) after program entry.[14]

The estimates in column (1) correspond well to previous Swedish work on related issues. Forslund and Nordström Skans (2006) estimated relative treatment effects of two programs for young participants, and found significantly better long-run effects of training programs along a number of labor market outcomes. Arbetsförmedlingen (2010b) presented estimated treatment effects for both programs. They found that training had a more favorable effect on the outflow from unemployment to work, over a one year horizon.

[14] The difference in the survival functions integrates to the difference in mean duration. Therefore, *WP*-participation will reduce unemployment duration relative to *LMT*-participation when the two survival functions cross (at 218 days). Thus, *LMT* only outperforms *WP* with respect to unemployment duration with an extended evaluation window.

Figure 7. Effect of work practice relative to labor market training on the flow to jobs



Source: Based on the results in Table 5.

Next, we examine whether the effects of *WP* relative to *LMT* depend on the business cycle. We thus interact the treatment dummies with regional unemployment (regional *u* denotes the regional unemployment rate at the month of program entry) to estimate differential relative program effects over the cycle.[15] Column (2) presents estimates without any additional controls. These estimates indicate that higher unemployment contributes to a smaller difference in lock-in effects between the programs. The post-program effect of *WP* relative to *LMT* also becomes more negative. All in all, this indicates that training is relatively more efficient in recession than in boom.

Note that even if the matched treatment and control group are comparable, these estimates may be biased. One reason is that the quality of programs may vary systematically with unemployment. Another reason is that the population of eligible individuals may differ systematically be-

[15] Regional unemployment is measured at the county level (*län*). It is defined as the number of individuals (aged 25-55) in each region registered as openly unemployed or as participants in a labor market program at the employment office relative to the total number of individuals (aged 25-55). The former is measured on the 15th each month and the latter is measured once a year using official statistics from Statistics Sweden. Due to its small size, we exclude the county of Gotland.

tween regions with high and low unemployment. We address these issues in two ways. First, we introduce regional fixed effects. These regional fixed effects take care of any unobserved differences across regions influencing program effectiveness, provided that these are constant over time. Second, we allow the treatment effects to vary by a number of important characteristics like age, gender and level of education. This extension should further alleviate any problem associated with differences in the composition of the pool of unemployed individuals across high and low unemployment states.

This refined analysis is presented in columns (3)-(5). First we add year and region fixed effects and allow the general effect to vary by year and region (col. 3); then we also add fixed effects by program start dates and allow the treatment effects to vary by program start date (col. 4). Finally, we add individual characteristics on top of the other covariates, and the treatment effects are once more allowed to vary by individual characteristics (col. 5).[16] In our most elaborate model (col. 5), we believe that it is highly unlikely that there are observed characteristics that may confound the correlation between the treatment effects and regional unemployment.

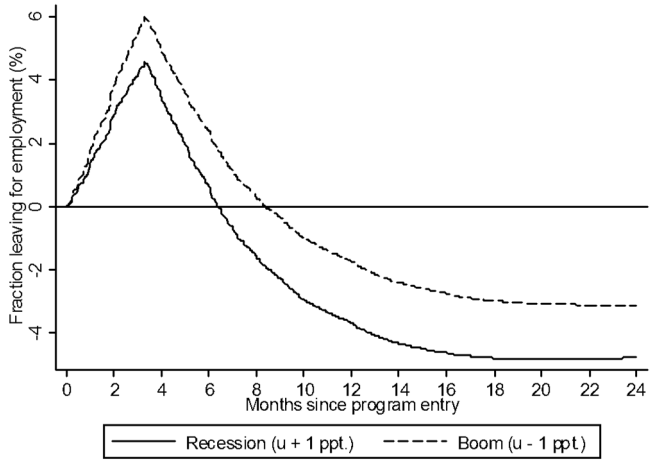
Our preferred model is thus the one presented in column (5). According to these results, it is still the case that, on average, training outperforms work practice in the longer run, despite the fact that the lock-in effect of training is larger than that of work practice. Moreover, the lock-in effect of training is smaller in recession, and the post-program effects also work in favor of training. The estimates in column (5) thus imply that training is relatively more efficient in recession than in boom, both because lock-in effects are less severe and because post-program effects are more beneficial when unemployment is high.

As argued above, it makes intuitive sense that the difference in lock-in effects between the programs is smaller in recession (high unemployment), since this is what one would expect if one thinks that the return to search is smaller when job-finding rates are low. We have no strong prior regarding the post-participation effects. But one may note that Lechner and Wunsch (2009) obtained analogous results.

[16]The reference individual is a woman with less than upper-secondary education living in Stockholm in 1999. Regional unemployment rates are deviations from the mean, so that main effects can be interpreted as the mean effect at mean unemployment for the reference person defined above.

What magnitudes are implied by the estimates in column (5)? To come up with a realistic evaluation point, we calculated the difference in unemployment across time within region and then took the median of these differences. Over the studied time period (1999-2005), a median region experienced a difference between high and low unemployment states in the order of two percentage points. Thus, we take an increase in unemployment by one percentage point to represent a recession, while a decrease by one percentage point represents a boom. Figure 8 illustrates the estimates by plotting the relative probability of leaving unemployment for employment across states of the business cycle.

Figure 8. Effect of work practice relative to labor market training on the flow to jobs in boom and recession



Source: Based on the results in Table 5.

Figure 8 shows that the lock-in effect of training is smaller in recession (the solid line is below the dashed line), that "break-even" occurs earlier in recession, and that the long-run treatment effect of training exceeds that of the practice program more in recession than in boom. Relative to work-practice, training has the long-run effect of increasing the probability of leaving for employment by 4.8 percentage points in a recession and 3.1 percentage points in a boom.

8. Concluding remarks

In this paper, we have considered the case for expanding program activity in a recession. We find that there is a reasonable case for doing so, which is tied to the different size of the lock-in effect in boom and recession. Thus, if programs with relatively large lock-in effects are ever to be used, they should be used in recession. The reason is simply that the cost of forgoing search time is lower in recession.

The above argument is primarily a case for expanding training in a recession. ALMPs affecting the returns to search (JSA and monitoring) should probably be reduced in recession.

The empirical evidence is extremely limited. Hitherto, Lechner and Wunsch (2009) is the only credible paper on this issue. They find that training appears to be more effective in a downturn. Nevertheless, this is only one study of a single program (training) for a single country (Germany).

To provide some more evidence, we have compared the effects of on-the-job training to labor market training. On average (over the cycle), the on-the-job training scheme is associated with smaller (negative) lock-in effects and smaller (positive) long-run effects than labor market training. Our evidence also shows that the relative size of the lock-in effect is smaller in recession and that the long-run effects become less beneficial in a downturn. This suggests that it is relatively more efficient to use the labor market training scheme in recession than in boom.

In some respects, our analysis is an improvement of the analysis by Lechner and Wunsch (2009), in others it is not. Despite the differences in the two approaches, our results are remarkably consistent with those of Lechner and Wunsch. Nevertheless, more evidence on this issue would be extremely welcome.

It is somewhat ironic that the clearest case for expanding program activity in recession pertains to training. A real problem is that training features relatively large fixed costs and capacity constraints. Therefore, the scale of this program is not easily adapted to the state of the business cycle.

Another caveat is that labor market training is likely to be more expensive than the on-the-job training scheme ("work practice"). According to Arbetsförmedlingen (2010a), the direct cost per participant was SEK

72 000 in 2008. Assuming that participants in labor market training (and work practice) would be paid a wage equal to the wage on the 25th percentile (SEK 20 900), and adjusting this number to take pay-roll taxes into account (pay-roll taxes roughly equal 40 percent), we conclude that labor market training would have to prolong employment duration by 2.5 months relative to work practice for the benefits to outweigh the costs.[17] This is substantially larger than the effects on unemployment duration that we can observe during the evaluation window. Our estimates suggest that training reduces (truncated) unemployment duration over a two-year follow-up horizon by 16.6 days in recession and by 4.4 days in boom relative to work practice. This rough calculation thus implies that the effects of training would have to persist well beyond the evaluation window for the cost-benefit analysis to come out in favor of training.[18]

It seems to us that program effects in different phases of the cycle would be a very fruitful area for further research. Having said this, we are the first to recognize that this is a hard evaluation problem. Nevertheless, the prospects for conducting a well designed study increase over time along with the build-up of administrative registers covering a sufficient time span.

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[17] To be more precise: $72\,000/(20\,900 \times 1.4) \approx 2.5$.

[18] Obviously, there are many caveats to this calculation. Even during the follow-up horizon, there are reasons to expect that we underestimate the benefits of training. First, we ignore the fact that training may reduce the probability of losing the job; the estimates in Forslund and Nordström Skans (2006) suggest that it improved employment stability relative to the alternative programs that they considered. Second, we assume that participants in training receive the same wage upon employment as participants in work practice; if anything we would expect training to contribute to higher wages relative to work practice.

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Comment on Forslund, Fredriksson and Vikström: What active labour market policy works in a recession?

Clas Olsson[*]

I would like to start by saying that this is a very interesting paper that treats an important issue. When I took up my current position at the Swedish Public Employment Service in early 2009 we were discussing this issue quite intensely. I was surprised to learn that the empirical evidence on this issue is so scant. One plausible explanation for this is neatly described in the paper – the almost overwhelming complexity of the evaluation problem involved.

The paper starts by giving the conceptual framework for thinking about possible variations in effects of ALMPs across the business cycle. This part of the paper is written in an efficient and lucid way and I do not have much to add to it. The authors point to the crucial role played by the complementarity between search intensity and the state of the labour market in terms of their effect on the probability of finding a job. It is this assumption that drives the possibility of varying "lock-in-effects" in different phases of the business cycle. To me, it seems like a plausible assumption much for the same reasons that diminishing returns to the production factors in a production function are usually a plausible assumption. But it would still not have been a bad thing if the empirical support (or lack of) for this assumption had been discussed in the paper.

A piece of information that might be of interest in this context is the fact that search intensity as such does not seem to vary over the business

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cycle, at least not according to the answers given by the job searchers themselves in the telephone interviews that we do regularly with all job seekers that are registered at our employment offices.

When it comes to the empirical parts of the paper, the authors present a very ambitious attempt to add some evidence to the questions raised in the introduction. A general comment on the empirical sections (5 and 7) concerns the definition and measurement of the business cycle. I would have welcomed a discussion of this issue for two reasons. First, it is not obvious at all how to define a business cycle, especially not the turning points of the cycle. So the reader might need some help in understanding how the authors deal with this issue. Second, I think I do not agree with the definitions that the authors have used. In fact, we do not seem to have the same interpretation of what is peak and bottom. The authors mention that they have chosen 1992 to represent a recession and 2005 to represent a boom. As far as I can understand the data from the labour force survey, the labour market reached a bottom in 2005 although economic growth was quite substantial. After that followed a period of rather rapid improvement, which culminated in 2007/2008. In a footnote the authors explain why they have not used data from 2006 or 2007, which look more like boom years, and their arguments seem reasonable. But in this case I think it would have been better to use data from earlier years.

Section 7 contains the authors' main contribution to the empirical analysis. In this section, they compare the relative efficacy in booms and recessions of two Swedish labour market programmes that have been used quite extensively: an on-the-job training scheme (arbetspraktik) and vocational training programmes (arbetsmarknadsutbildning). As far as I understand, the analysis is done in a very intelligent way using standard techniques. However, it is somewhat frustrating that it is so difficult to get a grasp of exactly how the analysis is done. Variables, data and statistical specifications are not described in any detail.

When it comes to the *results* of the empirical analysis in Section 7, I think they are very interesting and for the most part in line with what one would intuitively have expected. What surprised me somewhat was that the post-programme effects of training relative to work practice were more favourable in a recession. I would have thought that training would perform relatively better in terms of post-treatment effects in a boom, because in a boom it is easier to identify what to train for.

In addition, it is worth mentioning that although training seems to outperform work practice in terms of its net effect (lock-in plus treatment effect) on the probability of finding a job, this does not mean that training is automatically to be preferred in a recession. Training is substantially more expensive than work practice and the final cost benefit analysis has to weigh in these cost differences as well. This point is mentioned in the concluding section, but is of such crucial importance that it could well have been highlighted earlier in the paper.

With regard to Section 5, which is the other empirically oriented chapter, there are a few questions that I would like to raise with respect to the methods used. The first concerns the measurement of structural and cyclical change. In Subsection 5.1, the authors attempt to answer the question of to what extent recessions involve structural shocks. The result is interesting and shows that, on average, there seems to be as much structural change in a boom as in a recession, which is not what I would have expected to find.

It is, however, worth underlining that this result is likely to be sensitive to the measurement method chosen. The method used by the authors only captures structural change between sectors, but we know that, in reality, a great deal of structural change takes place within sectors, but between occupations. My presumption would be that this type of structural change is stronger in a recession.

Furthermore, the indicator used to determine if structural change is taking place in a sector is whether the sign of the change in unemployment is the same after and before a turning point. I think this way of measuring structural change risks missing an important pattern that we see in, for instance, the manufacturing sector, where employment does, in fact, resume after a recession, but the increase during the upturn is much smaller than the decrease during the downturn. Employment is diminishing in a structural way but this is not seen in an ever decreasing employment.

My second comment on Section 5 concerns the analysis of "Who loses the job in a recession?" in Subsection 5.2. Why does the analysis only comprise job losses? Job losses are not the only, and often not even the most important, source of changes in unemployment. Unemployment is also to a large extent determined by the number of people who enter directly into unemployment from a position outside the labour force, for

instance students. Furthermore, the relative importance of different sources of inflow into unemployment varies with the business cycle. In a downturn, job losses tend to be a more important source of unemployment whereas the opposite is true in an upturn. There are also differences in the extent to which various groups get access to ALMPs. People who are laid off are more likely to get access to active measures early on in their unemployment spell as compared to people who enter unemployment via other routes. It is not clear to me to what extent these patterns have been taken into account in the paper, but they are likely to have an impact on the registered effects of various measures over the business cycle.

A third comment on Section 5 relates to the measure used to capture skills among job losers, i.e. wages. It is indeed a practical measure, because it reduces skills to a one-dimensional indicator which, in turn, provides a way of dividing skills into observed and unobserved by means of the wage equation. But, at the same time, this is somewhat of a black-box approach. The assumptions that have to be fulfilled for wages to be a reflection of skills and skills only are, I presume, rather strict and unlikely to be fulfilled in practice. It would have been interesting to see some more direct measure of skill change among the unemployed, at least as a complement to the wage analysis.

In Subsection 5.3, the authors analyse to what extent the characteristics of programme participants change over the cycle. The observed pattern is that the low educated, immigrants and older people are to some extent crowded out of programmes in a recession by an increasing number of unemployed with other characteristics, while the opposite is true for young people. I do not think that this is good policy, but it is likely to reflect political realities. When unemployment is limited, it is possible to target ALMPs on the weaker groups, but when unemployment is high, it is often the case that all groups have to get a share of the programmes for political reasons, even those who might not need it the best.

My final comment concerns a point that is raised at the beginning of the paper, which is of interest given the results presented later on in the paper. The point concerns the mix between passive and active labour market policies over the business cycle and the fact that spending on ALMPs per unemployed tends to go down in a recession. Given the re-

sults presented in the paper, one would perhaps not expect this to be the optimal policy, since lock-in effects are smaller in a recession.

There are several plausible reasons for the observed pattern. It is, for example, more difficult to persuade companies to take on workers for on-the-job training programmes when they are in the process of downsizing their existing business. However, it may also reflect an adequate policy response. The fact that programmes with greater lock-in effects have a comparative advantage in a recession does not mean that their share of overall spending should be larger when unemployment is high. When unemployment goes up, this usually means that the composition of unemployment changes. There will be more unemployed people with a recent history of employment and who are well equipped to take the jobs that are offered in the labour market. Many of these would not benefit very much from active labour market measures. The opposite is true in a boom. A larger fraction of the unemployed will consist of people with a relatively weak position in the market, people who are likely to benefit more from various active measures.

Regular education as a tool of counter-cyclical employment policy*

Christopher A Pissarides**

Summary

This paper considers education as a counter-cyclical policy tool. In recession, unemployment goes up and there is an increase in private demand for education. This increase is in response to the fall in the cost of education, measured by the foregone income while studying, and by the uncertainties that face new entrants to the labour market in recession. The government should support the increase in this demand because the social costs of education, measured by the foregone output of the students, also fall. But protection against risk when workers are risk averse is not a social return to education. The government should back up the support of an increase in places of education with unemployment insurance, to protect against risk. Standards might fall when the number of educational places increases in recession. This should be tolerated because recession is costly for society and higher education should share some of these costs.

Keywords: Higher education, countercyclical policy, youth unemployment, active labour market policy.
JEL classification numbers: E24, I23, I28, J68.

* This paper is based on a paper commissioned by the Swedish Fiscal Policy Council (Studier i finanspolitik 2010/6). I am grateful for the comments of Lars Calmfors, Helena Svaleryd and other members of the Council, where the paper was presented in June 2010.

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This paper is about the suitability of regular education as a "counter-cyclical policy tool", i.e. the use of post-compulsory education as a destination for workers who would otherwise be unemployed, on government-sponsored programmes or, more generally, facing a bigger threat of unemployment than in normal times. Given the current climate, the main interest is whether the government should sponsor additional regular education for young people who, in more normal times, would have left school and entered the labour market.

In an economy operating under normal conditions of aggregate activity, the usual cycle for school leavers is job search followed by job "hopping", until a regular job is found. The durations of both job search and job holding for young people are usually short, at least when compared with those of adults. This process of frequent job search and job change is healthy, both for the individual and for society. Skills and preferences at a young age are still uncertain, and the features of available jobs are also uncertain. A "good match" in the labour market requires time and effort.

Recession puts at risk the efficiency of the matching process for young people. Because of skills that are specific to the job accumulated by older workers, employment protection legislation or union agreements, and generally loyalty towards one's own long-serving employees, recession hits the market for young people the hardest. The big sufferer is job creation. Job loss may increase by small amounts in recession, and attract the headlines, but in terms of human suffering and skill deterioration, it is the absence of job opportunities that hits hardest. Job loss would matter very little if new job creation was abundant and displaced workers obtained new jobs quickly. But in recession new entrants, and workers who lose their jobs as part of the normal course of events, often have to wait several months before new opportunities present themselves. Waiting for a new job can disenfranchise the worker from the labour market and destroy the willingness to work, if not the ability. For young people seeking their first regular employment, this process can have long-term consequences.

Governments react to recession with a number of measures for young people. Training programmes, subsidized employment, help with job search and information gathering are common across the OECD. The question that I investigate here is whether regular education beyond the minimum school-leaving age should be added to the list of "active labour

market measures." In particular, I discuss whether the government should sponsor additional years of schooling for young people completing the minimum education cycle, presumably on demand.

Several factors enter the decision of whether to take up this policy. Timing and duration are probably the most critical, when more education is compared with other measures. College and university capacity may be limited and the expansion of places to accommodate new entrants is not likely to be a quick and easy matter. Additional education needs additional teachers, and this is another matter that will need to be addressed by policy-makers. The education selection process, the decision to apply and enter higher-degree programmes, their duration and the possibility of dropping out before the degree programme has been completed are factors that will enter the decision of young people whether to take up the education route out of recession. The issue of how much help the government should give, and whether at this level the decision should be left to the private sector, are also important in the selection of government policies for young people.

In this paper, I take up each of these issues separately. In Section 1, I describe the process of individual decision-making and how recession is likely to be affected by it. In Section 2, I ask whether private decisions in response to recession are likely to be socially efficient, or if individuals demand too much or too little additional education in response to recession. In Section 3, I consider government policy in response to the increase in demand for education. In Section 4, I discuss the types of education provision that the government may want to sponsor in response to recession, and their implications for the labour market for young people and older workers. The implications of government choices in the expansion of education are further discussed in Section 5, with questions about the timing of the expansion and the risk of locking labour into educational programmes when recovery comes. Finally, Section 6 addresses the question of the quality of educational standards in a temporarily expanded system.

1. Private decisions

Even since the seminal work of Becker (1964), the decision whether to continue with education or stop and enter the labour market has been modelled as an investment decision. The benefits from continuing are the higher wages and lower unemployment that characterize the market for more educated workers. The costs are the earnings in the market for lower skills that are foregone during the education and any direct costs there might be (for example, tuition fees).

The literature usually measures the benefits from continuing with education as a percentage rate of return from one more year of schooling. Two individuals are compared, who are identical in all respects except that one has had one more year of education than the other. The rate of return to education is the percentage by which the hourly earnings of the more educated individual exceed those of the less educated one. The typical method for measuring this rate is the "Mincer equation". The log of wages is regressed on years of schooling and some other control variables that pick up differences between individuals. The coefficient on years of schooling is the rate of return to education.[1]

An important refinement of this estimate takes into account the incidence of unemployment. It is known from unemployment research that unemployment incidence falls with years of schooling. So by acquiring more education, an individual reduces the probability of becoming or remaining unemployed and avoids the loss of income and other costs of unemployment. Adjustments to the Mincerian rate of return to education for the different incidences of unemployment at different educational levels add small, but significant, amounts to the rate of return to education.[2]

Several other refinements are made to the rate of return estimates or to estimation methods, but these are not important in the debate on whether education should be used as an anti-cyclical device or not. One that may have some bearing on the issue is the impact of the quality of education. Quality, as measured by class size or student-teacher ratios, is an important influence on the rate of return to education. One more year of

[1] The main other control is experience in the labour market. See Mincer (1974) for the original contribution and Psacharopoulos (1994) for estimates from several countries.

[2] See Ashenfelter and Ham (1979), Nickell (1979) and Weber (2002) for estimates for the United States and several European countries.

schooling in a small class can add more to earnings than a year in a crowded class.

An optimizing individual chooses whether to stay one more year at school by comparing the rate of return to education with the cost, expressed, like the rate of return, as a percentage of unskilled earnings. The cost is mainly the foregone earnings during the year of education and any out-of-pocket costs. Foregone earnings depend on unemployment in the unskilled market. If the probability of becoming unemployed is higher, the foregone cost of education is lower for the obvious reason that the unemployed do not earn a wage. Any unemployment compensation or other type of subsidy that might be available by the government increases the cost of education by reducing the cost of unemployment for the individual.

Equilibrium in the market for education is reached at the point where a sufficient number of individuals choose the additional year of education until the rate of return goes down to the level of the cost. The rate of return falls with the number of trained individuals because of diminishing returns to production. As the number of workers with a certain level of education increases, the expected earnings of those workers decrease. They also fall because of ability differences. Higher-ability individuals command a higher rate of return from a given education if ability and learning are complements (that is, if higher-ability individuals make better use of their learned skills in employment and become more productive than lower-ability individuals with the same education). Alternatively, higher-ability individuals may benefit from their ability to learn faster, as in the signalling theory of Spence (1973). Whatever the reason, higher-ability individuals have an advantage over lower-ability ones in the education system and are likely to enter colleges and universities first.

1.1 The impact of recession on private decisions

The impact of recession on the private decision whether to stay on at school or not is threefold. First, a higher probability of unemployment in the immediate future reduces the foregone costs of education. Second, less well educated individuals experience more unemployment than the better educated ones, so recession has a bigger impact on those with less education. And finally, in recession family incomes are lower and to the

extent that young people finance their education out of family incomes, this financing becomes more difficult to obtain. We take each effect in turn.

Lower probability of unemployment

If we ignore risk aversion and the differential incidence of unemployment, the higher unemployment during recession reduces everyone's costs by the ensuing fall in expected annual earnings. If the individual chooses labour force entry instead of education, her expected earnings are total earnings in the fraction of time that she expects to be employed. If now, because of recession, youth unemployment is (say) ten percentage points higher, on average expected market earnings should be less by about ten per cent but total expected income might not fall by the full ten per cent because of transfers to the unemployed.

But this impact of unemployment on the decision to stay on at school is not likely to be a very big one. First, the numbers involved are not very big. Even large increases in youth unemployment, like the ten percentage point rise in the preceding example, have a fairly small impact on expected costs. If we take into account the government programmes that are usually available to young unemployed workers, and the family support that is provided, the fall in expected earnings will not produce a very big fall in the costs of staying on at school.

But the incidence of unemployment is not evenly spread. A ten percentage point increase in unemployment does not reduce every new entrant's market income by ten per cent. The majority of workers will not experience unemployment beyond an initial short period of job search. Those with longer durations of search, or who experience repeated spells, suffer much more than a ten per cent fall in earnings. With longer durations of unemployment, current incomes suffer disproportionally and the uncertainties about future income and employment prospects (the "scarring" effect of unemployment) are also bigger. The costs of unemployment rise fast with duration, as skills are forgotten, unemployment compensation is either exhausted or becomes more difficult to obtain and programme participation becomes compulsory. Although most research finds that the scarring effect of unemployment on young workers is not as large as it is on older displaced workers, there is still a large effect on

earnings several years after the unemployed youths have returned to work.[3] In a study that uses the differential experience of siblings to identify the scarring effect of unemployment on young Swedish workers, Nordström Skans (2004) finds substantial scarring effects. For each percentage point rise in the incidence of unemployment, he finds that earnings five years later are about six per cent less. With risk aversion and imperfect (or, more likely, entirely missing) insurance markets for young people, these uncertainties about the duration of unemployment and its impact on current and future earnings could generate a large demand for education.

A second reason that also exerts a positive influence on the demand for education is the fact that the incidence of unemployment in later life falls with the level of educational attainment. The correlation between employment prospects and educational attainment makes people "buy insurance" against future unemployment, by staying on at school. However, since recessions do not last long and a recession now does not increase the chances of future recessions, this is an important factor only if individuals reaching the end of their schooling cycle expect the recession to continue until after they graduate. Alternatively, information may not be complete and the recession and job loss by adult workers make young people more aware of the risks of unemployment in later life if they dropped out of school too soon.

A practice common in Sweden and some other countries (increasingly so in Britain) that is likely to be affected by recession because of the link between education and unemployment is the "gap" year. Young people finishing high school get a job for a few months, and use their income to travel before entering university the following year. The fact that recession hits the employment prospects of school leavers hardest implies that those intending to take a job temporarily before entering university may revise their plans and enter university immediately. The chances that a large fraction of the gap year might be wasted looking for a job lead to a higher demand for education, perhaps postponing the activities associated

[3] See the introduction by Arulampalam et al. (2001) and the papers in the same special issue of *The Economic Journal* for evidence from the UK, Card and Lemieux (2000), Ellwood (2000) and the other chapters in the same book for evidence from the US, and Ryan (2001) for a survey. A conclusion from this literature is that the scarring effect from unemployment depends on duration. It is weakest in North America, where the average unemployment duration for youths is short, and strongest in European countries with longer durations.

with a gap year until after graduation, when a job would be easier to get. The fall in the take-up of a gap year adds more cyclicality in university applications than what would be implied by the net increase in demand. At the end of the recession, more school leavers take a gap year and those who would have returned from their gap year to apply for places are already at the university.

Against the two reasons for a positive impact of recession on the demand for education is the argument that family income suffers in recession. In a world with perfect capital markets and inexpensive loans available to young people, family income should not be an influence on the education decision of young people. Like other investment decisions, demand for education is a forward-looking decision: it should primarily depend on future income prospects, the cost of time and the cost of borrowing to pay for it and finance consumption.

But capital markets for young people at school are not perfect and their education is in many countries to a large extent financed by their family. Families that suffer an income loss in recession would be less inclined to finance additional education for their children. In contrast, when the uncertainty attached to family income is increased because of recession, the family may jointly decide that older children completing the minimum educational cycle should enter the labour market to reduce the overall income risk attached to the family as a unit. This additional participation is sometimes known as the "added worker" effect, and it is a form of household insurance against the increased uncertainty in recession.

Empirical research

The impact of unemployment on demand for education is the topic of most published empirical research on the implications of recession for education. Most published research finds strong evidence that enrolments in higher education institutions increase in response to an increase in unemployment. The other important variable in these regressions is the differential between the earnings of degree holders and school leavers. But this differential is not a cyclical variable. Although it shows large

swings in most countries, they are unconnected with the regular unemployment cycle.[4]

Most of the empirical work is for the US. The elasticity with which unemployment influences enrolments varies across studies, and the definition of unemployment also varies. For example, youth unemployment would be a more appropriate measure of the cost of education, but because total unemployment is more widely available and better measured, it is sometimes used as the explanatory variable for the cycle. The general conclusion, however, is that current unemployment has a positive influence on demand for education.[5]

The empirical work on the impact of recession on unemployment, however, does not exploit the full, forward-looking nature of the Becker model. The impact of unemployment on enrolments should depend on the expected duration of the recession, on the impact of the recession on the incidence and duration of unemployment, on the availability of alternative income sources – or training programmes – for young unemployed people and on the impact of recession on family incomes. These are factors that are usually ignored when the enrolment regression is estimated.

Another relevant factor that is usually not reported in the empirical papers is the quantitative impact of unemployment on demand for education. Although unemployment elasticities (or semi-elasticities) are estimated, empirical work in this area is still a qualitative exercise that is looking to test the model's predictions rather than estimate how many more people will remain at school as a result of recession. In other words, although there is an impact of recession on demand for education, it is not computed quantitatively how much difference it really makes to the educational attainment of the cohort. As a consequence, the published empirical work does not provide a guide as to whether a universal scheme run by the government will provide a substitute or whether it will be much more comprehensive than the private response to recession.

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[4] See among others, Betts and McFarland (1995) for evidence from the US, Kodde (1998) for evidence from the Netherlands, Fredriksson (1997) for evidence from Sweden, and Pissarides (1982) and Whitfield and Wilson (1991) for evidence from the UK.

[5] An exception is Micklewright et al. (1990) who find that although youth enrolment rates went up in Britain when there was a sharp increase in unemployment, the increase could not be attributed to the rise in (local) unemployment. However, their study was for a cross section of youths and it did not analyse the impact of relative earnings between graduates and non-graduates, so their estimates of the impact of economic incentives on education suffered from omitted variables.

2. Social efficiency

Social efficiency has to be seen in the context of missing markets, mistakes in private decisions or policy distortions. In a complete rational-expectations setting with perfect capital markets and no policy distortions, the private decisions to increase educational attainment in recession must be socially efficient. A distinction must be drawn here between social inefficiencies that might exist even in normal times, and social inefficiencies that might arise because of recession. Our concern in this paper is with the latter, so we ignore the social inefficiencies that arise because of educational externalities and policy distortions such as subsidised education costs and subsidised unemployment income. More specifically we ask, first, in a benchmark world where private decisions before the recession were socially efficient, is the increase in demand for education in recession socially efficient as well? And second, does recession justify an increase in government support to education and training along the lines of the steady-state support that they receive, or is a change in policy warranted?

The cost of education to society is mainly the foregone output from those who take education and the human and physical capital invested in teaching, which could be invested elsewhere. The benefit is that the extra education makes workers more productive. If foregone output now falls because of less job creation, it necessarily implies that the social cost of education is lower and so more people need to stay on at school to reduce the rate of return to education to a new equilibrium. Complementing this, the productivity of human and physical capital elsewhere is now also lower, leading to the conclusion that there should be more investment in teaching to balance the rates of return to labour and capital across sectors of economic activity. Where might there be a social failure in this scenario, that might imply either under-education or over-education?

2.1 Education as a substitute for unemployment insurance

In the benchmark world of this example, where education decisions are efficient in the steady state, social failures might arise because of increased unemployment risk during recession, which is uninsurable in private markets, and increased moral hazard from publically provided

insurance. In recession, there is increased uncertainty about job prospects. As argued in the preceding section, the increased uncertainty in recession and the fear of unemployment are important components of the costs of education. In the absence of unemployment insurance for new entrants, individuals overreact to the risk of unemployment and demand too much schooling to shield themselves against it. Education here acts as a second-best insurance market for young people. The socially efficient response only requires that private demand increases in response to the fall in expected costs. But if new entrants fear that they might suffer long durations of unemployment with low income support, they will increase their private demand by far more than the required social increase. The additional increase could be avoided with perfect income support, namely, by a policy that distributed the lower expected income from recession equitably across all labour market entrants. But such a policy (whose existence has become a common and widely accepted assumption in the search and matching literature under the heading "large family assumption") creates disincentives and moral hazard.

Education is clearly not a good insurance instrument from society's point of view. Absent moral hazard, insurance provided by pooling risks is the optimal response. The key question in the debate of whether it is socially efficient to support the increase in private demand for education is reduced to the question of whether the costs of moral hazard from the pooling of risks are less than the costs of the extra education.

The answer to this question requires a properly specified quantitative model which can be used to compare the marginal costs of education with the marginal costs of the moral hazard from insurance. Such models do not exist. But there are large costs of education: foregone output during the learning process, externalities on the learning of others if the supply of teachers and classroom space are not flexible, and a larger than optimal entry of "over-educated" workers a few years later. In addition, there are many ways in which the moral hazard from insurance can be reduced through active labour market programmes. One might therefore speculate that a generous unemployment insurance system backed up by active measures to reduce moral hazard would dominate the use of education as a shield against the risk of unemployment.[6]

[6] See the next section for more discussion of the disincentive effects of unemployment insurance.

A second social failure is due to the reliance on family income for educational financing. In a complete markets scenario, family income should not matter because education is a forward-looking investment. In recession, family incomes suffer and this might lead to withdrawals from education that are suboptimal. We saw that empirically this effect does not appear to be a dominant one but, of course, this does not imply that it is absent. As not every school leaver decides to stay on at school in recession, it is possible that some withdraw because of loss of family income. It would be difficult to estimate this effect empirically and identify the impact of this channel because of the data requirements. One would need a panel of individuals with both family income and the educational decisions of younger members reported.

2.2 Myopic decisions

Finally, myopia in individual decisions – or lack of foresight due to the complexities of forecasting future prospects – would also lead to inefficiencies. In a series of publications, Richard Freeman (1976) made the argument that demand for education is subject to a "cobweb" response to earning incentives. Individuals respond to current earning prospects and unemployment, not paying due attention to the fact that by the time they graduate, their earnings will be determined by new supply and demand conditions. In particular, if enrolments go up in response to recession, when these workers come out the economy would have recovered but there would be a bigger supply of graduates. With a larger supply, graduate earnings would not recover as much as the rest of the incomes in the economy, and so the demand for education in the recovery phase would fall by too much.

This argument is not for too much or too little demand for education but for inefficient cycles in it. The relevance for recession is that there is an overreaction to the fall in earnings and the rise in unemployment. Too many young people stay on at school compared to a rational-expectations equilibrium where the cobweb cycle is anticipated. Potential school leavers see the rise in adult unemployment and stay on at school to increase their employability through more education, although the recession will be over by the time they complete their education and apply for jobs. Betts and McFarland (1995) estimate strong adult unemployment effects

that they attribute to this channel. Although this might be the case, the estimate might also be a reflection of the fact that the national unemployment rate is the headline figure reported and the more reliable indicator of cyclical labour market conditions. It might be picking up youth unemployment effects.

Developments in the financing of higher education and the growth in living standards may have diminished the importance of family income for higher education. In most countries, higher education is generously subsidized by the government, through grants or student loans. The loss of family income though unemployment is compensated by the government, especially when there are documented needs, like children at school. So even if the capital markets needed to facilitate the financing of higher education are absent, government policy or accumulated personal savings compensate for it.

But the other reasons for social inefficiency, risk aversion and myopia, are more difficult to counteract with policy. Both these imply that in recession, private demand for higher education is too high. Education is a poor insurance instrument against the uncertainties of job finding, because of the high social costs that its acquisition imposes. Income transfers to those actually becoming unemployed, or subsidized help with job finding, are better instruments.[7]

3. Government policy in the provision of education

A high fraction of both men and women enter higher education in Sweden. In terms of numbers, this entry is likely to rise over the next three years because of an increase in the cohorts reaching the relevant age. Moreover, education is largely government financed, with more than 80 per cent of the costs covered by the government. Standards are high by international criteria. So realistically, if education is to be used as a counter-cyclical device and standards are not to be allowed to fall, the government will need to provide more funds.

[7] One should expect to see more cyclicality in the demand for education in countries that do not offer unemployment insurance or active measures to support the transition to work, because of the risk aversion motive. But this prediction has not been tested with data.

There is a number of issues that are relevant to the question of how pro-active the government should be in the provision of additional funding for higher education in a recession. The first is whether the government should attempt to accommodate private demands and so provide funding for all additional places for which there is demand. Naturally, not everyone who applies to enter higher education is successful. By meeting the additional demand, we mean that a sufficient number of new places is provided to maintain the rejection rates at their normal levels.

There is widespread evidence from schooling that the quality of education, measured by such things as class size or teacher-pupil ratios, affects the productivity and wages of those obtaining it. This evidence, however, is for schooling, and not for higher education. For higher education, the focus is usually on governance and funding issues, with the main findings pointing to more international success when more independence is given to the university to run its own degree programmes, choose its own entry standards and make its own faculty appointments.[8] Sweden is one of the more successful countries in the world in this respect, despite extensive government funding. With the independence that Swedish higher institutions enjoy, and the quality of their degree programmes, it follows that if education is to be encouraged as a counter-cyclical device, more resources should be provided by the government; otherwise either the additional students applying for places would not be successful or the standards would fall for everyone.

The important issue then is whether the increased demand for education in recession is socially efficient, and whether it is the best alternative open to the government. On the social efficiency issue, we have argued that there are grounds for supporting an expansion of higher education in recession, but that private demand probably overreacts to the rise in unemployment. Rather than not making places available in recession, however, the government would be moving closer to social efficiency if it dealt more directly with the factors that cause the overreaction to the demand for education

We have argued that the increase in demand for higher education that is due to the fall in costs is socially efficient, but the demand due to the insurance motive is not. A response to this would, rather than expanding

[8] This claim is mainly based on the evaluation of the research performance of universities. See Aghion et al. (2007).

higher-education places sufficiently to accommodate all demand, is to expand the insurance provision against youth unemployment to curb the insurance demand. An obvious way of doing this is to pay more unemployment insurance to young unemployed individuals. But this introduces moral hazard, another social failure. There is considerable evidence for disincentive effects of unemployment compensation, both in Sweden and elsewhere. Carling et al. (2001) find that in Sweden, a five percentage point fall in the unemployment benefit replacement ratio in 1996 (the ratio of benefits to the mean wage) increased the transition from unemployment to employment by about ten per cent. Meyer (1990) found that in the US, a ten percentage point increase in the replacement ratio increased the duration of unemployment by a number in the region of one to one and a half weeks. Other US estimates imply smaller disincentive effects. Given mean US unemployment durations, this is a smaller effect than in Sweden, corresponding to about an 8-10 per cent reduction in the transition rate. Layard and Nickell (1991) report that a ten percentage point increase in the average replacement ratio implies a 1.1 percentage point higher unemployment which, in turn, implies a larger disincentive effect of about 20 per cent on the transition rate. However, in the Layard and Nickell study, the total effect includes wage effects from unemployment insurance, whereas the other studies are microeconometric studies focusing on individual moral hazard.[9]

Given these disincentives from unemployment insurance, it is clearly not the case that the optimal response to the overreaction of the demand for education in recession is an unconditional increase in the provision of unemployment insurance. The insurance motive for more education is mainly driven by the fear of long durations of unemployment. If young people knew that jobs would be found quickly after labour-force entry or after job loss, unemployment would not be sufficiently costly for them to enter a degree programme to protect against it. It follows that government policies designed to protect young people from income uncertainty due to unemployment should focus on duration. But if there are also strong li-

[9] Chetty (2008) recently challenged the literature that attributes these effects to moral hazard, finding evidence that the biggest disincentive effect from unemployment insurance is due to liquidity effects. This may be particularly relevant for the youth labour market. His claim implies a new approach to the design of optimal unemployment insurance, which he takes up to find higher optimal insurance than what has been found by previous researchers.

quidity effects from unemployment, these policies should be combined with generous replacement ratios.

There is evidence that as an individual is moving closer to the date when unconditional unemployment benefits are exhausted and programme participation begins, the transition to employment increases.[10] The literature on the effectiveness of programme participation is divided, but there is some evidence that programmes are more effective if they involve job subsidies and actual employment experience. Assistance with job search is universally found to be effective, whereas training (especially off-work training) is not, except for some evidence that there might be some long-term beneficial effects on youths.[11] Once such programmes are in place for young people, the insurance demand for higher education will fall. But the demand due to the fall in the foregone earnings arising from unemployment will still remain and the government would be acting optimally if it supported this demand with more funding.

Another issue of relevance is whether subsidies and loans given to students should change in response to recession. There is no apparent reason for this to happen. An exception might be made in the case of a fall in family income, when more generous support may be provided. But even in that case, it would be beneficial to deal with the fall in family income directly with the family, rather than by providing more assistance to students coming from those families. In general, there are no apparent reasons that dictate that the per student education subsidy should rise (or fall) in recession.

[10] See Carling et al. (1996), Meyer (1990), Forslund and Nordström Skans (2006) and Geerdsen and Holm (2007). The last two studies also suggest that the "fear" of programme participation is one of the incentives for faster transition to employment as unconditional benefits approach exhaustion.

[11] The literature on programme evaluation is too large to summarise or even list. See Calmfors et al. (2004) and Larsson (2003) for a summary of the effectiveness of programmes in Sweden in the 1990s and Sianesi (2008) for a good evaluation study. Forslund and Nordström Skans (2006) find some evidence of possible long-run effects on youths, but they are sceptical about their generality. More supportive evidence for long-run (after 10 years) effects of youth training programmes was found by Strandh and Nordlund (2008).

4. Types of education and implications

Choosing the type of education involves looking at both the costs of the provision and the outcome, in terms of the employability of the degree holders. The "flexibility" of the type, namely whether expansion and contraction can be achieved quickly and without cost, is also relevant. If the type is left entirely to private demand, the applicants will choose on the basis of outcome and their interests. The government subsidy to students ensures that the differential costs of providing places do not affect the costs that students pay. Governments should therefore pay attention to the cost of provision beyond any desire to satisfy private demand.

Since the expansion of education for cyclical reasons is likely to be temporary, it would be appropriate to subsidize the increase of places in areas where costs are smaller and there is no requirement for a large infrastructure. For example, it would not make sense to build more science laboratories in recession to accommodate the counter-cyclical demand for education, if they are to be underutilized at the end of recession. In contrast, areas that attract large numbers of applicants in Sweden, like medical and social care services, can be expanded and contracted at little cost.

Costs are highest in areas that are not likely to attract a lot of additional numbers in recession. These include medicine and the sciences. Medicine is an area where competition for places is the hardest. But new applicants for places who turned away from the labour market because of recession are not likely to look to become doctors, an education which it takes a long time to complete and which requires high entrance qualifications. The demand for science places has been declining in Sweden as elsewhere, so again this is not likely to be a high-demand area. So overall, although costs should enter the choice of areas for expansion, the education courses that are less expensive to provide are also the ones that are likely to be most in demand. Providing more places where there is currently more demand will probably prove to be the best option overall.

General education gives the broadest base from which the school leaver can apply for jobs. The more specific knowledge required for the job can be acquired on the job. A combination of more general types of regular education with more specialist training programmes through subsidised firm employment seems to be the best policy. This combination also gives some choice to the individual, whether to opt for the shorter

and more specialized training programmes or the longer and broader degree courses.

In terms of labour market implications, counter-cyclical variations in regular education take more young workers out of the active labour market in recession, and introduce more college leavers in the market a few years later. In recession, the withdrawal of workers from the youth labour market has positive externalities on the employability and earnings of those that remain. Although changes in labour supply do not have an impact on unemployment and earnings levels in the long run, because of changes in the capital stock, restricting the entry into the labour force can have substantial effects in the short run. Job creation and investment in the short run and in the middle of recession are not likely to respond to the size of the entry into the labour force. A fall in entry through the expansion of regular education almost certainly reduces the number of job applicants one-for-one. With a fixed number of job openings, the chances that those who remain will get jobs increase.

The expansion of education also has implications for the cost of government support programmes for young people. Since the unemployment of young people is lower with the expansion of education, the cost of government support programmes that are available to young unemployed people is also lower. Whether the savings from such programmes are sufficient to cover the costs of the additional education is a matter of degree and coverage. One should expect, however, that the increase in the number of young people at school will not be reflected one-for-one in a reduction in the number of young people on government support programmes. Employment is also likely to fall when fewer young people enter the labour force, especially if those who are successful in gaining entry into colleges and universities are the more able ones.

The fall in labour force entry may also have an impact on the adult labour market. Previous research has found that the market for young workers is complementary to the market for women (Boeri et al. 2005), so there might be some benefits in the women's market from the fall in the number of young workers. This is especially important for Sweden, where large numbers of women enter the labour force in the areas which are likely to attract more demand from young people, such as social and medical services.

5. Timing issues

The issues of when to sponsor educational programmes and for what duration are important because of the length of the educational cycle. The educational cycle is such that entry is usually once a year, whereas the duration of courses is usually more than a year. The annual cycle implies that the response to recession cannot be instant, whereas the long duration implies that the government may be forced to continue to sponsor education programmes long after the end of recession. Training within firms has an advantage over regular education in this respect. Is this likely to be important?

For practical purposes, the educational entry decision has to be made at the end of the school year, and that is the time when the government has to make the additional places available. From the policy point of view, the starting and stopping dates are difficult to choose, because both need some advanced planning. They also depend on the timing and length of recession, which are difficult to forecast. Some issues may be brought to bear on this choice.

First, students who are completing school after the start of the recession may decide to apply directly for higher degree programmes, or they may try their luck in the labour market first. It is likely that the increase in demand for education soon after the start of recession is less than the increase a year later, if recession persists, due to discouragement effects as the experience of recession takes hold. But because of the timing of the school year, it is clearly important for the government to plan to begin its expansion of education in the first school year after the beginning of recession. It should also expect an increase in the demand for education over the following year, and be ready with more support, in anticipation of the discouragement of the school leavers.

The same applies for the end of support for counter-cyclical purposes. When recession is over and job opportunities become more plentiful, school leavers are likely to drop their demand for more education and enter the labour market. Depending on the type of investments that the government supported in recession, the winding down of the expansion should be planned well ahead.

Given the likelihood that some young people will drop out of the labour market and apply for degree programmes with some delay, the gov-

ernment might consider the possibility of allowing some delayed entry into educational programmes. The short break between the end of the school year and the beginning of degree courses may not be long enough to persuade school leavers that more investment in education is a better response to recession than the risk of unemployment.

A second issue is the long duration of degree programmes. Even one-year programmes might be too long if the recession were to end before the end of the year. But two- or three-year courses are more common. The evidence of Betts and McFarland (1995) shows that in an unregulated market the increase in demand for education is mainly for shorter courses, and that once students have started, they do not drop out before the end of their degree. This makes intuitive sense. Those who are buying more education because the costs are temporarily down will want to retain some flexibility to re-enter the labour market as soon as the conditions change, rather than commit to a long-term programme of study. But once they have chosen a programme and spend time on it, they will want to complete it, and take full advantage of the new qualification when re-entering the labour market.

So although there is a risk of lock-in effects when students commit to long-term programmes, it is not likely to be a serious risk. Students are unlikely to commit to long-term programmes, unless they were intending to do so in the first place. And once they have started, they are likely to realise that in order to enjoy the full additional return from the programme, they need to complete it. Society also benefits from education, through higher productivity. In that case, far from being concerned about lock-in effects, the government should rather be concerned with ensuring that its supported programmes are seen through to completion.

6. Educational achievement

Educational standards and achievement could be put at risk if the quality of education is allowed to fall because of the temporary expansion. Governments might be tempted to do this, because of the need to cut spending in recession, when tax revenues are down. The achievement is also likely to be less because the new students entering are likely to be less able than

the ones already in the system.[12] This is inevitable in any expansion of student numbers, and it is likely to be a consequence of the temporary expansion due to recession. A number of steps might be taken to reduce the risks of falling standards.

First, the expansion needs to be supported by an increase in teacher places, perhaps offering jobs on fixed-term contracts. Space also needs to be expanded as class size is an important quality indicator. Second, universities need to be left alone to pick candidates following their normal admission criteria. In Sweden, as in most other countries, higher-degree places usually go to people from a more privileged background. This does not mean that they are of better quality than people from less privileged backgrounds. Perhaps recession forces many young people from less privileged backgrounds to apply for places, and they end up being very successful. In order to ensure that candidates are admitted to places that are best suited to their abilities and interests, normal admission criteria have to be respected.

Finally, even a small fall in achievement levels because of recession may be a better alternative to unemployment. In fact, one can also make the case that it is desirable. Recession worsens outcomes for new entrants to the labour market. By definition, the standards of living and well-being cannot be the same everywhere in recession as in an economic boom. The government needs to spend money to support incomes due to more poverty, more programmes for the unemployed and more education. Revenues are down because of falling taxation revenues, and the globalisation of financial markets acts as a severe constraint on debt financing. Inevitably, standards have to give somewhere. There are no strong arguments why standards of government service should fall elsewhere and not for educational institutions. The lowering of standards in some degree programmes can reduce some of the adverse effects of recession in the labour market, which may be a good way of diversifying the losses. Otherwise, governments may not have enough resources to allow a sufficiently large expansion of educational places to satisfy the extra demand. It is important, however, that university governance and resources are main-

[12] In its report, however, The Fiscal Policy Council (2010, chapter 9), found that in previous recessions in Sweden (but not in 2009), the qualification requirements rose when there was an increase in the applicant pool. But the Council also found a fall in educational quality, which it attributed to factors other than the quality of the entry pool.

tained at the usual high standard after recession, in order to avoid reducing standards for those in the system in steady state.

7. Conclusions

There are sound arguments for making use of regular education as a counter-cyclical device. The main argument is that the foregone cost of education, the social output that young workers would produce if they instead entered the labour market, fluctuates with the cycle. In recession unemployment is high, and reducing entry into the labour force by expanding the places in higher education benefits both those who take up the places and those who join the labour force.

There is a large amount of evidence that private demand for education increases in recession. Moreover, the students who enter colleges and universities because of the risk of unemployment usually remain at school until they have completed their course. In countries where university places depend on government funding, the government ought to provide the additional funding required to accommodate the increase in demand for places. But government policy towards the expansion of regular education in recession ought to be part of a more general anti-recession policy that includes unemployment insurance and active programmes for the young unemployed. Countries that do not have alternative support mechanisms for young people out of work are likely to experience an increase in the demand for education above the socially efficient level, the level that would be chosen by a social planner on the basis of the fall in the costs of education.

Questions about what type of education should be provided, and how long degree courses should be, partly depend on demand and partly on the overall government policy towards education and training. On balance, it appears that the most beneficial kind of regular education is a general one, leaving the acquisition of specific skills for training at the firm level. This is because of the difficulty in forecasting specific needs and the time lags involved in regular education. Educational standards should also be preserved by allowing colleges and universities flexibility to choose their own candidates and degree courses. But some temporary fall in standards in recession is inevitable, and perhaps desirable, because of the admission

of less able people that would have entered the labour force had there been jobs, and because recessions reduce the well-being across the economy, and diversifying between the labour market and education is more equitable. The temporary expansion and contraction of good quality regular education is not a straightforward matter, but there is no reason to believe that it is more difficult to achieve than other active labour market policy measures.

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Comment on Pissarides: Regular education as a tool of counter-cyclical employment policy*

Björn Öckert**

Should we add regular education to our toolbox of active labor market policies? In a thoughtful and well-written paper, Christopher Pissarides argues that we should. The main reason is that the opportunity cost of education, i.e. forgone production while studying, falls during economic downturns. However, if all youths were hit equally by an economic recession, even quite substantial increases in the unemployment rate would only have marginal effects on the costs of going to college. But, as Pissarides points out, the risk of unemployment is not evenly spread, and letting individuals who would otherwise be long-term unemployed go to college would probably reduce youth unemployment.[1]

Since college students typically come from the upper part of the ability distribution, they may not suffer as much from economic recessions as others. In this comment, I will provide evidence for Sweden on the unemployment risks among potential college students.[2] In particular, I will show how the risk of unemployment varies over the ability distribution,

* I would like to thank Peter Fredriksson and Anna Sjögren for valuable comments.
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[1] Pissarides' paper is a general discussion of the use of regular education as a counter-cyclical measure. In most countries, however, education at the primary level and at the high-school level is available for all individuals. Thus, both Pissarides' paper and my own comment focus on education at the college level.
[2] The analysis is descriptive in nature. The unemployment risk for those who go to college, had they not enrolled, is estimated from those who do not go to college.

and where in the distribution individuals are more likely to go to college. More importantly, however, I will document how individuals of different ability are hit by economic recessions and who go to college in response to economic swings. Finally, I will discuss how expanding the number of college places during recessions may affect youth unemployment.

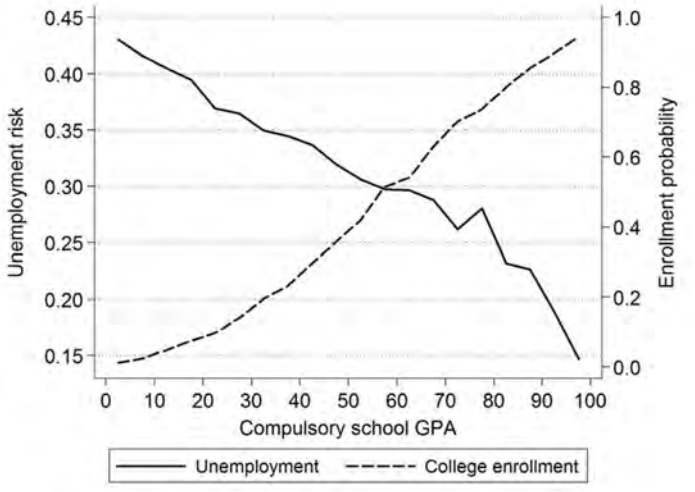
1. Unemployment risks and enrollment across the ability distribution

The main motivation for expanding the number of college places during recessions is that the opportunity costs of going to college fall substantially for individuals who suffer from long unemployment spells. This may alter the investment decisions for potential college students who are at the margin of applying to college. The crucial question is then how the risk of long-term unemployment varies over the business cycle for potential college students. Since it is typically the more able who go to college, I will study the risk of unemployment over the ability distribution.

As a starting point, I show the average unemployment risks among potential college students (regardless of cycle). Figure 1 illustrates long-term unemployment and college enrollment for 19-24 year-olds, by the students' compulsory school grade point averages (GPA).[3] Clearly, the risk of unemployment falls sharply with ability, and those with high grades face a rather low risk of long-term unemployment. The relationship between compulsory school grades and college enrollment looks quite the opposite: the typical college student comes from the upper part of the ability distribution. Thus, the unemployment risk among potential college students is quite low on average. The question is how the unemployment risk for potential college students changes under different economic conditions, and which students go to college in response to economic downturns.

[3] The analysis is based on individuals born 1976-81 and covers the years 1995-2005. Long-term unemployment is defined as having an unemployment spell of at least one year in ages 19-24. Individuals who have enrolled in college are excluded from the population at risk of becoming unemployed. Compulsory school GPA has been percentile ranked (1-100).

Figure 1. Probability of college enrollment and long-term unemployment



Source: Own calculations using data from Statistics Sweden and the Swedish Public Employment Service.

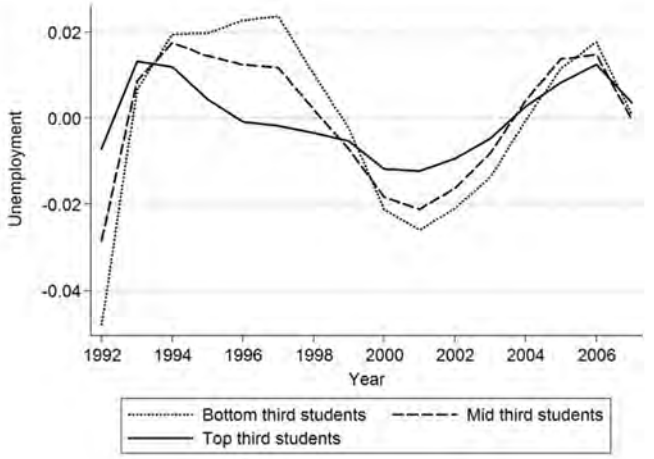
2. Unemployment risks and college enrollment over the business cycle

Many studies have shown that individuals who are weakly attached to the labor market, e.g. women, immigrants, youths and low-educated, fare worse during recessions than other groups (see e.g. Hines et al., 2001 for a review), but I have found no earlier study that documents the unemployment risks over the business cycle for individuals of different ability. Therefore, Figure 2 shows de-trended series of youth (19-24-year-olds) unemployment 1992-2007, by compulsory school GPA.[4] Clearly, the bottom third students are more sensitive to the prevailing economic conditions than are the middle or top third students. In good times, less able workers do relatively better, while they are hit much harder by economic recessions. In contrast, the unemployment risk for the top third students does not vary that much with the business cycle. Thus, the opportunity

[4] Individuals who are enrolled in school have been excluded from the population at risk of becoming unemployed. To account for selective school enrollment, equal weight is given to all percentiles of the ability distribution. The series have been de-trended using a Hodrick-Prescott filter.

costs of going to college fall the most for less able students during a recession, while the forgone earnings while studying are less sensitive to different economic conditions for the more able.

Figure 2. De-trended youth unemployment 1992-2007, by compulsory school GPA



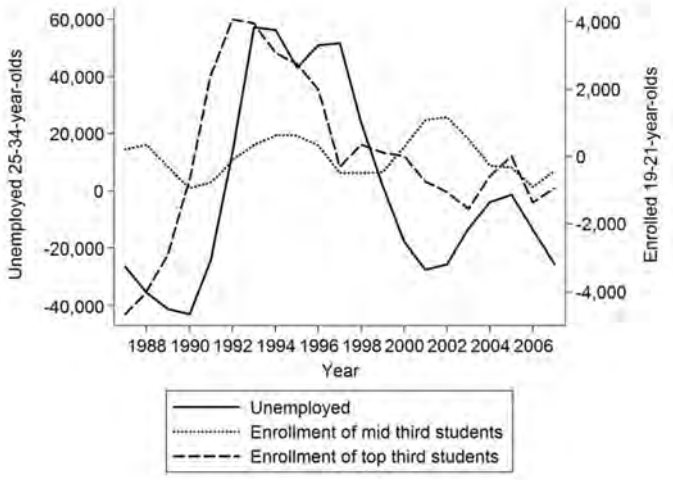
Source: Own calculations using data from Statistics Sweden and the Swedish Public Employment Service.

The relatively larger fall in opportunity costs for the less able would suggest students who enter college in response to an economic downturn to be of lower quality than at other times. However, this depends on how different groups react to recessions and the extent to which colleges let admission standards fall (or increase). Figure 3 shows de-trended series of the number of unemployed 25-34-year-olds and the number of enrolled 19-21-year-olds over the 1987-2007 period, both for the top students and for the mid third students. The figure shows several interesting patterns. First, college enrollment in Sweden is counter-cyclical, with more students enrolling when unemployment is high. Second, students respond to economic downturns *before* unemployment has actually begun to rise. Third, the enrollment response to economic swings is almost entirely driven by the top third students.[5]

[5] This does not necessarily mean that the response to economic swings is stronger among the more able than among the less able; the pattern may partly be driven by higher admission standards at Swedish colleges as the number of applicants per place increases. Nevertheless, the evidence suggests that top students react strongly to economic conditions, even though they are less likely to suffer from long unemployment spells than others.

In sum, the opportunity cost of going to college during economic recessions falls disproportionally more for individuals who typically never go to college. Thus, it is quite likely that expanding the number of college places in bad times primarily affects individuals who are expected not to suffer that much from long-term unemployment anyway. The argument with falling opportunity costs during economic downturns may therefore be substantially weaker among potential college students than for the average individual.[6]

Figure 3. De-trended unemployment and enrollment, by compulsory school GPA



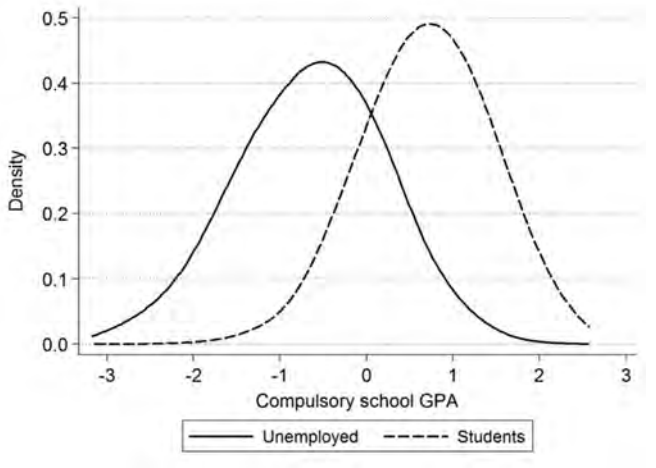
Source: Own calculations using data from Statistics Sweden and the Swedish Public Employment Service.

[6] The figure shows how individuals of different ability are expected to be hit by a recession. In reality, some high-ability individuals may suffer disproportionally more from long-term unemployment than others, and the opportunity costs of going to college may fall sharply for them. However, the exact realization of long unemployment spells is not known in advance. It is only when the recession hits the economy that it becomes evident who has suffered the most. But then it may be too late. If individuals wait until they become (long-term) unemployed before applying to college, much of the reduced opportunity cost has already been incurred. Thus, without knowledge of the exact realization of long unemployment spells, it is likely that individuals primarily react to the expected unemployment risks, and those who later turn out to suffer more from the recession are not *à priori* expected to react more strongly than others.

3. Counter-cyclical college supply and youth unemployment

Even though the opportunity cost of going to college may not fall that much during recessions for those who typically go to college, expanding the number of college places in bad times may still have an effect on youth unemployment. The more the colleges expand, the smaller the cohort entering the labor market will be, and the fewer the job applicants per vacant job. Exactly how much youth unemployment is affected depends, among other things, on the share of the marginal college students who would otherwise have been unemployed.

Figure 4. Distribution of GPA for unemployed and college students



Source: Own calculations using data from Statistics Sweden and the Swedish Public Employment Service.

Figure 4 shows the ability distributions for long-term unemployed youths and college students, respectively.[7] Although there is some overlap, it is clear that unemployed youth and college students come from different parts of the ability distribution. Thus, students who are affected by college expansions during recessions are not likely to come from the

[7] The figure shows Kernel density estimates of the compulsory school GPA distributions for individuals born 1976-81 who have experienced long-term unemployment or who have enrolled in college at ages 19-24. Individuals who have both been unemployed and enrolled in college are treated as college students.

pool of long-term unemployed youths. Counter-cyclical college supply is therefore likely to only have a minor *direct* effect on youth unemployment. The extent to which expanding the number of college places during recessions may affect youth unemployment then depends on the degree of substitutability between high-ability and low-ability workers.[8]

4. Concluding remarks

In this comment, I have provided Swedish evidence suggesting that the opportunity costs of going to college may not fall that much during recessions for those who actually go to college. I also argue that adjusting the number of college places to the business cycle may only have minor direct effects on youth unemployment, since those affected are less likely to suffer from long-term unemployment anyway. This raises some doubts about using college education as a counter-cyclical device. Nevertheless, it may still be sensible with marginal adjustments of the number of college places in response to changing economic conditions, not the least since the unemployment risk varies somewhat over the business cycle also for potential college students.

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[8] College expansion during recessions may also affect other groups, such as women or immigrants.

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TemaNord 2011:544
ISBN 978-92-893-2251-5
ISSN 1904-4526