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# Have Unskilled Youths Become More Vulnerable to Unemployment in Switzerland?

## Introduction

Unemployment scourges many countries, but Switzerland has been known for a long time as a place where unemployment is a “non-problem” (e.g. Flückiger, 1998). The situation has clearly changed since the mid-nineties, when unemployment rose to national record levels and peaked at around 5% in 1997. Young workers, especially unskilled ones, are the most vulnerable to unemployment, and we therefore focus on this socio-economic group. Our contention is that evolution in trade, new technologies and workplace organisation might have an adverse impact on low-skilled young workers.

The gap between highly qualified workers and those having achieved only intermediate or basic education has widened over the past 20 years in most developed economies, raising concerns about increasing income inequality (Juhn et al., 1993; Card & DiNardo, 2002). This literature has focused on the relative situation of highly educated individuals, and has tried to uncover the determinants of this growing inequality. Among the latter, one can mention technological change, globalization, or the loss of union power.

This paper examines young workers in Switzerland who failed to achieve any formal education beyond compulsory schooling. We focus on the labour market status of these young workers, and compare it with those of adults in order to identify possible changes that have occurred over the last decades. Why should one scrutinize young and low-skilled workers in particular? First, from an economic policy point of view, one may be interested in the fate of the most vulnerable. Second, the impact of globalization and technological change on the situation of the least qualified workers is ambiguous. The recent evolution of the labour market shows that the least-skilled workers tend to work in small service industries which are hard to automate or outsource (Oesch & Rodríguez Menés, 2011). While inequality

has increased, it cannot be ascertained whether the situation of the most vulnerable has worsened.

More concretely, we study the labour market outcomes of young individuals (15–24 years old) with little or no qualifications in the Swiss labour market over the period from 1991 to 2008. Lack of qualifications might cause lower earnings and higher unemployment risk. Moreover, we investigate the type of working contracts and job precariousness. Our motivation lies in the fact that unemployment, as an indicator, does not fully reflect the situation of young workers on the Swiss labour market, because the unemployment rate is typically low when compared to other OECD countries. Moreover, it does not account for the fact that some young workers must accept precarious jobs in order to make ends meet. Further, Giuliano & Spilimbergo (2009) have recently shown that “growing up in a recession” can shape the socio-economic beliefs of young workers and in particular their attitudes toward labour markets. It appears that workers who first enter the labour market during a recession are more likely to believe in luck rather than effort. Moreover, they show a higher preference for government redistribution. Another motivation lies in the “social cost” of youth unemployment when things go well around. The social stigmas associated with unemployment are in fact bound to be higher when few people are concerned and unemployed are exceptions (Clark, 2003).

The remainder of the paper is organised as follows. Section 2 discusses the causes and consequences of youth unemployment. Section 3 provides a general picture of Swiss youth unemployment in international comparison. Section 4 distinguishes between skilled and unskilled youths and examines the evolution of the unemployment rate for both groups. Section 5 deals with the concept of “precariousness” to see if any change has happened over the last decades. In Section 6, we use the panel feature of our dataset (the Swiss Labour Force Survey) to study labour market transitions for youths with respect to their skill level, in order to see if some barriers are at play for lower skilled workers. In Section 7, we address the question of wage differentials. Skills are assumed to be rewarded with a premium, the size of which may have evolved through time. Finally, Section 8 concludes.

### **Causes and consequences of youth unemployment**

Several economic theories might explain why young workers are more likely to be unemployed than older ones. In the human capital theory (Becker, 1964; Ben-Porath, 1967), individuals acquire skills through education and

experience. Because young individuals have no or little experience when they enter the labour market, their likelihood of finding a job is lower. For the same reason, the quality of their jobs is lower in terms of precariousness, job related benefits, and promotion perspectives. Further, young workers are mechanically less tenured and therefore possess less firm-specific human capital. In case of a downturn, they will be laid-off first as the firm will try to retain more tenured workers who have more value to it. It has in fact long been known from the human capital literature that skills (in particular specific ones) act as a buffer during downturns (Oi, 1962).

Young individuals are also the most affected by labour market regulation such as minimum wage or employment protection policies. Such policies might indeed discourage employers from creating low value added jobs, which would likely be taken up by young inexperienced workers.

The signalling theory (Spence, 1973) might also explain part of the difference between youth and adult unemployment rates. Employers, who have only imperfect information about workers, infer applicants' ability from their previous employment records. This implies that an individual's past employment record will matter to her future employment chances, especially if true ability is difficult to gauge accurately through other means like qualifications and diplomas. Young workers, having limited or no previous employment history, are therefore disadvantaged as older workers convey more reliable information about their ability to attract employers.

It is also quite obvious that frictional unemployment is more frequent among young workers. School leavers are indeed bound to spend some time before finding their first job. Furthermore, young workers are less likely to be well matched with their current firm and are thus more likely to move.

A large empirical literature has documented the impact of youth unemployment. A general consensus is that the effects of an unemployment spell suffered while young are very long lasting (Ellwood, 1982; Kletzer & Fairlie, 2003; Gregg & Tominey, 2005; Mroz & Savage, 2006). For the young, a spell of unemployment does not end with that spell: it increases the likelihood of experiencing further unemployment and imposes a significant wage penalty for many years. Burgess et al. (2003), separating young individuals by their qualification level, find adverse effects on later unemployment of early career unemployment for the unskilled and the reverse for the more skilled. Bell & Blanchflower (2011) analyse youth unemployment in developed countries and argue that young people have been particularly hardly hit during the 2009 recession following the subprime crisis.

Hence, there is a clear concern in the literature about the situation of young workers, especially unskilled ones, vis-à-vis unemployment and the potential detrimental effect on their career.

### Youth unemployment in Switzerland

The Swiss unemployment rate remained extremely low until the 90s, when it rose to a peak of 5% in 1997. Although still quite honourable when compared to other European countries, unemployment was never to return to its golden age level, and this has raised many concerns about the way to tackle the unprecedented unemployment problem, and in particular, the fate of young unemployed.

However, youth unemployment in Switzerland is still not perceived as a serious problem. To illustrate this, it needs only be mentioned that a new legislation discriminating against youths in unemployment has been accepted by referendum (September 26, 2010). Individuals under 25 are now penalised in terms of waiting period before unemployment benefits can be obtained as well as in terms of duration of these benefits.

The official youth unemployment rate in Switzerland has fluctuated between 2% and 5% over the period 2000–2010. In average, the unemployment rate was 3.7% over the whole period for the 15–24 years old, whereas it was 3.1% for the 25–49 years old.<sup>1</sup>

It is well-known that structural and cultural factors account for notable differences in unemployment between Swiss-German and Latin cantons, with the latter experiencing systematically higher unemployment rates and longer unemployment durations. Breen (2005) shows that the educational system plays a crucial role in shaping the signalling value of a job seeker's profile for a given job. Because there exist significant differences in importance and design of vocational training across Swiss regions<sup>2</sup>, youth unemployment rate and its duration might be affected. Brügger et al. (2009) provide a discussion and evidence on the link between culture and unemployment.

With regard to youth unemployment rate however, it is worth noting that although it is higher in absolute value in Latin cantons, the ratio of youth-to-adult unemployment rate is in fact higher for the German speaking part of Switzerland. This implies unemployment as a whole is a greater problem for Latin cantons, but that youths are more at risk compared to adults in German speaking cantons. This is mainly driven by the somewhat lower unemployment rate for adults in the German speaking region, rather than a higher absolute unemployment for Swiss German youths.

Looking at the ratio of youth-to-adult unemployment rate for Switzerland as a whole, it appears that it has substantially increased from around 1 in 2000 to 1.3 in 2006 and then declined to 1.1 in 2010. This ratio seems to move in a countercyclical fashion, which can be explained by the greater vulnerability of young workers to business cycle downturns. Employers may be more reluctant to fire older workers, and implicitly use *last in, first out* rules to decide on layoffs. Further, young workers are more at risk of being unemployed when first entering a slack labour market with respect to adults who are already in employment.

The ratios of youth-to-adult unemployment rate remain much below what prevails in some other European countries. In particular, Italy, France and Spain are known for experiencing much higher youth unemployment rates and youth-to-adult unemployment ratios (OECD, 2008; Lassibile et al., 2001). With more than 80% of youth being employed one year after leaving education, Switzerland ranks second behind Iceland among OECD countries, whereas Spain and France are below 70% and Italy is even below 60%. The median time between leaving school and starting work is less than 8½ months for young Swiss adults. The average for the EU-15 is more than 21½ months and reaches a startling five years in some countries (OECD, 2008, p. 46). Explaining the reasons of such large differences in employment rates is beyond the scope of this paper. Suffice it to say that the dual educational system, a relatively unregulated labour market, decentralized and moderate wage bargaining, high competitiveness in exports of high value-added goods are often cited as major determinants of these outcomes (Flückiger, 1998). With respect to youth unemployment, the educational factor and potential barriers to entry are clearly the most relevant ones. Breen (2005) classifies OECD countries in terms of labour market regulation and educational signalling. Switzerland stands out as the only country with Denmark where employment protection is low and educational signalling (through vocational training) is high.

This rapid overview of youth labour market perspectives shows that the Swiss labour market is relatively kind to newcomers. However, a minority of low skilled workers may face increasing difficulties when employers' demand for skills gradually rises.

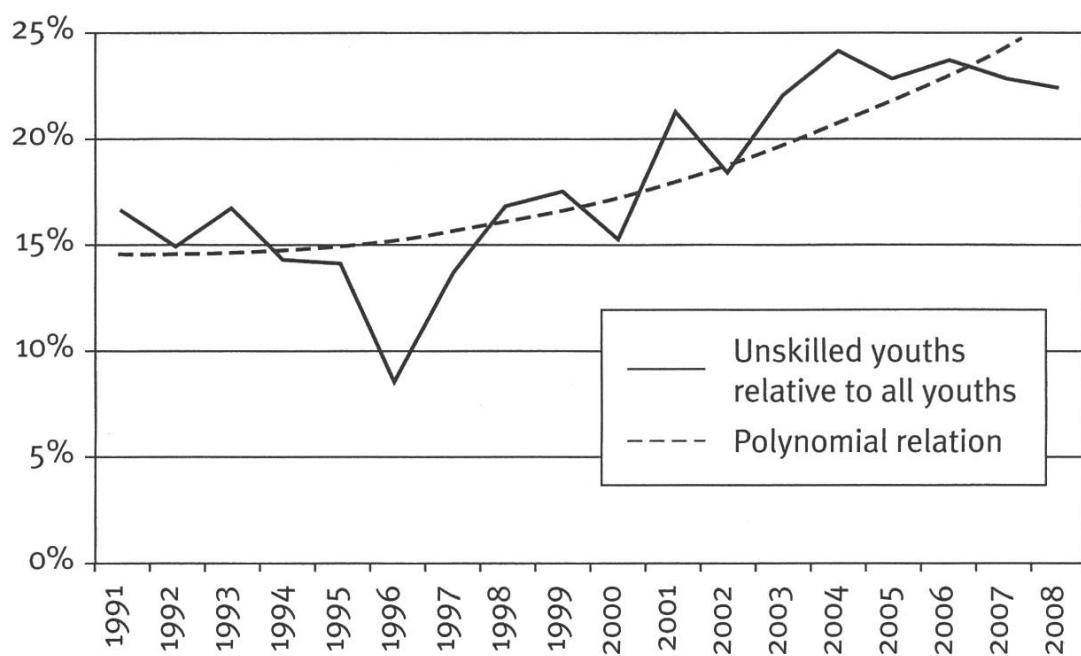
### **Skilled and unskilled workers: who are they?**

We now turn to some descriptive statistics comparing skilled and unskilled workers. We use data from the Swiss Labour Force Survey (SLFS), which is carried out every year since 1991 by the Swiss Federal Statistical Office

(SFSO). It contains very detailed information about the labour status, wages, training, socioeconomic characteristics, and the composition of the respondent's household. Individuals who take part in the survey are contacted up to five years in a row, which makes the SLFS an unbalanced panel. The SLFS contains about 16 000 yearly observations between 1991 and 2001. It was enlarged in 2002 to roughly 33 000 individuals, in order to provide accurate statistics at the canton level. The nice feature of the SLFS is that it contains much information on young workers over a relatively long period.

Figure 1

Relative share of unskilled to all youths (15–24)



Data source: SLFS.

The unskilled youths are defined by the following criteria:

- › They are between 15 and 24 years old.
- › They have completed at most compulsory school.
- › They are active, i. e. either in employment or in unemployment.
- › They are not currently pursuing an apprenticeship, a school or a professional training.<sup>3</sup>

Skilled youths are simply defined as those who have achieved an education higher than compulsory school. Clearly, large differences in outcome may exist *within* our "skilled" workers group. But remember that we are mainly interested in the group with the lowest level of human capital.

**Table 1** Youth labour market status and socio-demographic characteristics

Professional status	Share		Difference
	Unskilled	Skilled	(unskilled mean – skilled mean)
Self-employed	2.2%	2.7%	-0.5%
Family business	5.0%	1.7%	3.3% ***
Employee	65.9%	87.7%	-21.8% ***
Registered unemployment	8.9%	3.6%	5.3% ***
Unregistered unemployment	18.0%	4.3%	13.7% ***
Female	46.2%	50.7%	-4.5% ***
Foreigner	46.4%	20.4%	26.0% ***
Living with parent(s)	81.7%	76.8%	4.9% ***
Age <sup>a</sup>	19.9	22.0	-2.1 ***

\*\*\*/\*\*/\* Difference is significant at the 0.01/0.05/0.1 level.

a: Mean value for age

Source: SLFS 1991–2008. Authors' computations.

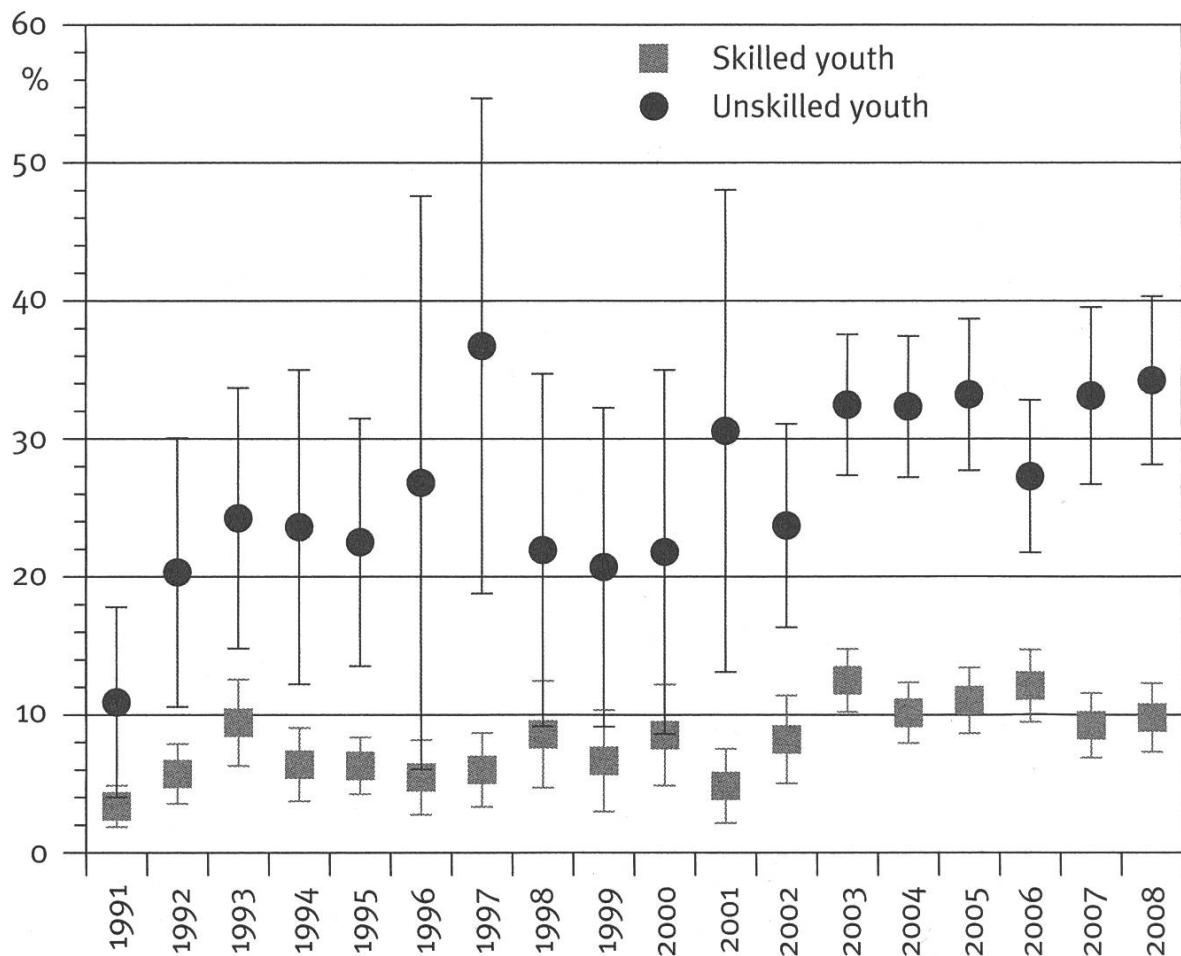
The notable feature of Figure 1 is the marked increase in the share of youths who have no skills or very low skills. In order to show the underlying trend, we have fitted a second order polynomial, represented by the dashed line. The share of unskilled young workers has increased from one sixth to almost a quarter between 1991 and 2008. This increase may be at the origin of more unfavourable labour market prospects. What caused this increase is difficult to assess. Demographic changes, immigration and a more demanding educational system all come to mind. Falter et al. (2011) measure the importance of parental background on educational track choices and subsequent wages for a sample of cohorts born between 1920 and 1979, but their analysis does not enable one to extrapolate any particular tendency for people without skills. Notice also that these numbers may hide re-entry into education at a later time, and most certainly overestimate the true ratio of unskilled persons. It nevertheless remains that the trend cannot be denied.<sup>4</sup>

Averaging over the whole period 1991–2008, it appears that skilled and unskilled active youths are quite different in terms of labour market status (Table 1). Self-employment being rare at young age, this explains the insignificant difference between the two groups, but interestingly unskilled youths have higher chances to work in family businesses than their skilled counterparts. One possible (but unsubstantiated) hypothesis

would be that the family acts as a temporary or even permanent cushion for young low skilled workers.

Figure 2

Youth unemployment rate in Switzerland by skill level



The following figures are the two sides of the same coin: employment prospects are simply better for skilled youths, and registered unemployment is 2.5 times higher for unskilled young workers. Skilled youths appear to register more regularly than unskilled workers. This could be due to a better understanding of the unemployment insurance scheme for skilled workers. The difference in age is not surprising since skills acquisition requires additional years in education. The proportion of foreigners in the unskilled group is larger. This could be due to language acquisition problems or other obstacles to education. More unexpected is the difference between male and female young workers in terms of skills, since low skilled workers are significantly predominantly men.

We now turn to unemployment by skill level. Figure 2 shows the trend in unemployment rates for both skilled and unskilled young work-

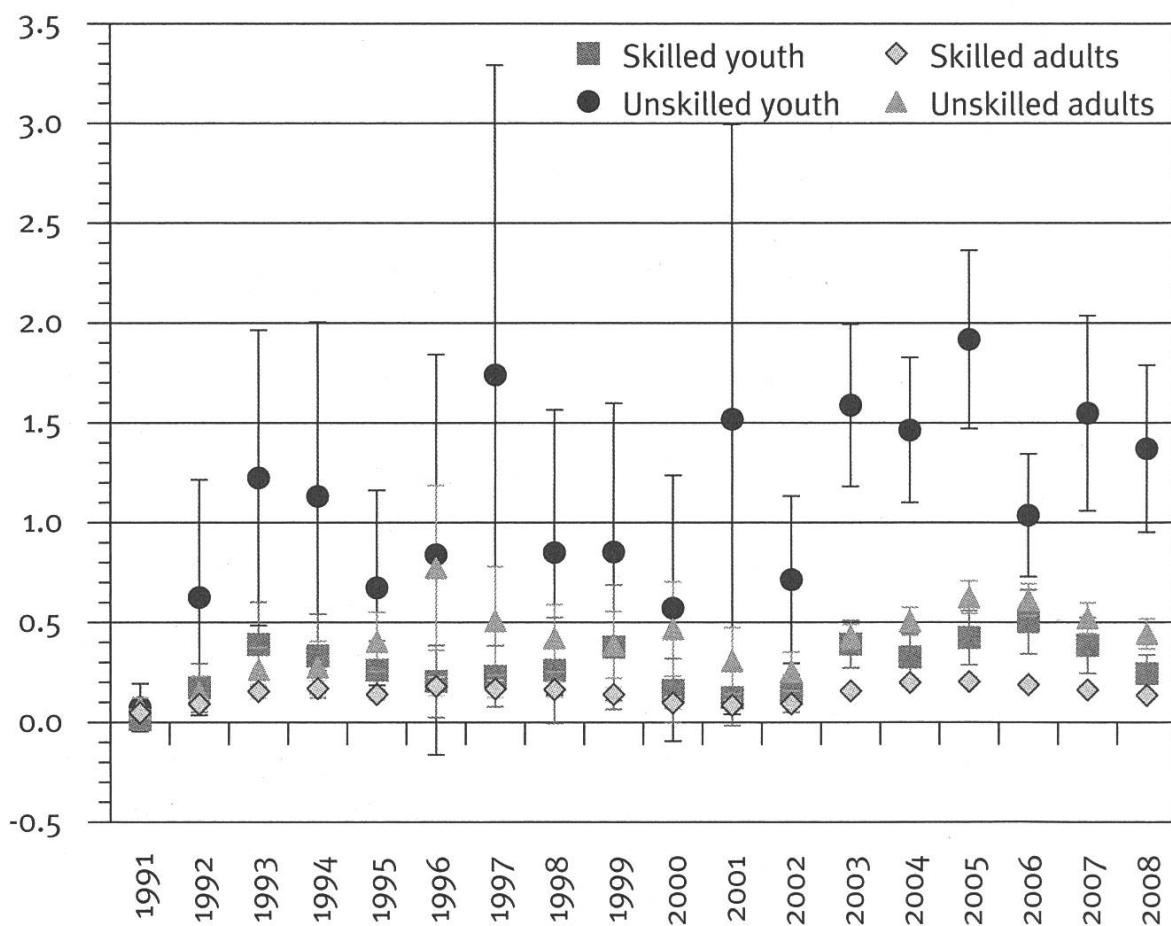
ers. There seems to be an important structural break in unemployment rates from 2003 onward. Although unemployment is systematically higher for unskilled workers, the difference only becomes statistically significant for the later years. Further, some greater hysteresis may be at work for unskilled youths than for skilled ones, since total unemployment started to decline early in 2005, while differences between the two groups remain high. Over the years 1996–2002, the average difference in unemployment rates was a little more than 8 percentage points, whereas it becomes around 14 percentage points from 2003 to 2008.<sup>5</sup>

It is difficult to say whether this evolution is only due to the business cycle, or if structural changes may account for the greater resilience in unemployment for low-skilled workers. In any case, rapid change in skills demand is a plausible explanation of greater precariousness for those only possessing basic skills in a knowledge-based society. It is however difficult to quantify this effect, as well as to ascertain that the beginning of the century really marks a shift in employers' attitudes toward unskilled workers. An abundant literature has documented this change in the demand for skills arising already in the 1980s (Juhn et al., 1993; Krueger, 1993). Some authors (for instance Wood, 1995, or Sachs & Shatz, 1996) have pointed to trade as being the main driving force of the increasing inequality, whereas some others (DiNardo et al. 1996) stress the importance of institutional changes, most notably the fall in minimum wage and deunionization. Further, some recent literature points to some substitution away from skilled workers, when their tasks can be integrated in software which makes it less than obvious that the trend is bad for unskilled workers. Middle skills are more at risk of computerization than totally unskilled workers (Autor et al., 2006). Our contention is that, even if unskilled workers are not completely substitutable by machines or computers, the relative demand for their tasks may have declined in the last decades and put some pressure on their employment prospects and wages. Minimum wages<sup>6</sup> may have reinforced this precariousness if employers become more demanding to fulfil jobs which are subject to binding minimum wages. Hence, more than greater demand for computer literacy that may or may not have caused greater labour market integration problems for unskilled workers, it is the minimal set of skills for menial jobs that may have changed in the recent years.

Figure 3 reveals that by taking a stricter definition of unemployment, namely only spells that exceed six months, there is now a notable difference for our group of interest. From 2003 onwards, young workers without skills tend to stay longer on the dole than their skilled or adult coun-

Figure 3

Six month unemployment by age group and skill level



terparts<sup>7</sup>. Unemployment duration is an important parameter in assessing the job prospects of people without employment. Although some time is needed to optimize the job match, a longer duration obviously carries some signalling of unfavourable productive characteristics, which may feed back into the duration itself. Discouragement and social stigma associated with unemployment also render the search less active and extend the unemployment spell, or even drive people out of the labour market. Again, data over a longer period and data on unemployment spells of all durations would help in making a less speculative diagnostic.

If our descriptive statistics point to some difference occurring at the turn of the millennium, it may be of interest to check if the difference is significant not only between the two groups but over time. To better grasp the labour market condition of young workers, we construct different measures of unemployment. "Current unemployment" only takes into consideration people who are unemployed at the time they are interviewed. "Six month unemployment" is our proxy for long-term unemploy-

ment since it only includes workers having been unemployed for at least six months. “Unemployed once” applies to people having been unemployed at least once in the year preceding the interview. This looser definition of unemployment should better capture job instability, when people switch between jobs with short periods of unemployment between them. Table 2 shows that differences between the two periods 1991–2002 and 2003–2008 are highly significant for all unemployment measures. Only the difference in “unemployed once” for unskilled youths is significant at a lesser level than 0.01. Notice also that differences remain significant when the break year is moved by one year.

Whichever the unemployment measure, differences are much larger for unskilled workers than for skilled workers. The test does not nec-

**Table 2** **Structural break tests (2003–2008 mean – 1991–2002 mean)**

Student's t-test	Difference	p-value	95% Confidence Interval	
<b>Difference in “current unemployment”</b>				
Skilled youths	3.92%	0.000	2.35%	5.48%
Unskilled youths	6.15%	0.046	0.12%	12.18%
<b>Difference in “six month unemployment”</b>				
Skilled youths	1.65%	0.000	0.74%	2.55%
Unskilled youths	4.53%	0.046	0.09%	8.96%
<b>Difference in “unemployed once”</b>				
Skilled youths	3.75%	0.000	1.84%	5.67%
Unskilled youths	3.13%	0.339	-3.30%	9.56%

essarily imply any change in the way the labour market operates before and after 2003. It could well be that the ups and downs of the business cycle make these differences more or less visible. As shown by Flückiger et al. (2008), differences across groups or regions with respect to unemployment tend to be larger at times of relatively low unemployment rates. Further, 2002 is the year when bilateral agreements with the EU came into force, opening up the Swiss labour market to EU residents, and it could account (at least partially) for the large difference observed in youth unemployment rates between the two periods.

## Job precariousness

Our variable “unemployed once” does not tell the whole story about the precarious nature of the worker’s current job or labour market status. Job “churning” may even have a positive connotation considering that mobile workers, especially at a young age, are shopping for a better job. Having multiple employment spells also enriches young workers’ curricula and labour market experience. We therefore look at some other labour market indicators of precariousness to see if differences appear between skilled and unskilled youths. Some indicators are provided in Table 3.

**Table 3 Job precariousness for young employed workers**

Variable	Mean value		Difference (unskilled mean – skilled mean)
	Unskilled	Skilled	
Number of employers	1.04	1.04	0.00
Employment duration <sup>a</sup>	3.14	4.41	-1.27 ***
Short term contract <sup>b</sup>	37.05%	39.86%	-2.8%
Temporary work agency <sup>c</sup>	11.06%	7.50%	3.6% ***
Job search <sup>d</sup>	22.82%	14.56%	8.3% ***

\*\*\*/\*\*/\* Difference is significant at the 0.01/0.05/0.1 level.

Source: SLFS 1991–2008. Authors’ computations.

a: Number of years without being unemployed.

b: Contract is for a determined period of employment.

c: Currently in employment through a temporary work agency.

d: On-the-job search.

The average number of employers is exactly the same for the two groups. This may be due to the very low variance of this variable (the vast majority of workers across the two groups has only one employer). In terms of employment duration, there is a substantial difference of almost 16 months between skilled and unskilled young workers. This difference might be explained by the higher mean age of skilled workers. Another plausible explanation lies in the longer and more frequent unemployment spells that unskilled workers endure, especially when first entering the labour market. Unskilled youths are also more often in a short term contract, with no promise of continuing the employment relationship afterwards, making them more exposed to job insecurity. They more often resort to temporary work agencies to find work. Jobs obtained through work agencies typically pay little, and provide few fringe benefits or paid holidays. Finally, almost one out of four unskilled workers in employment is looking for a (better) job, whereas not even one in six skilled workers is actively searching. This

result may point to greater average job dissatisfaction for the former group. We also looked at other possible indicators of precariousness, but the image is somewhat more blurred. Night and weekend work, for instance, could be imposed on workers with limited outside options. However, there is little evidence that unskilled workers are more subject to these undesirable forms of employment. Only for people working both Saturday and Sunday and regular night work is a positive and significant difference observed between unskilled and skilled workers. For occasional night or evening work, the difference is even reversed and statistically significant: skilled workers are more often employed in the evening. Clearly, some bias may be induced by the very occupation-specific nature of the timetable that workers may have in both groups. For instance, nurses (skilled workers) may work occasionally at night, whereas bartenders (unskilled workers) will work at night on more a regular basis.

In any case, an interesting feature of our precariousness indicators is that there is practically no pattern or evolution over time. Again, this result is difficult to interpret in terms of causal relationship with the business cycle, or changing structures in the economy.

### **Labour market transitions**

The analysis of unemployment or employment status, and precariousness conducted in the last two sections only provides limited indications about labour market evolution. Mean groups values, even when they follow different trends, may be subject to various confounding factors. Another approach that may complement our analysis of the Swiss labour market is to look at transition tables (Tables 4a–4b). These tables are constructed by comparing the labour market status of an individual at time  $t$  with her status in the previous period ( $t-1$ ). The limitation of this approach lies in the sometimes very low number of observed transitions for a given group that can render any inference almost impossible.

As regards self-employment, no significant difference arises between the transition rates of skilled and unskilled to (salaried) employment. However, unskilled self-employed will end up unemployed almost three times more often than their skilled counterparts. Family business is quite interesting in terms of transitions. Very few young workers in family businesses (whatever their skill level) will ever transit to unemployment. It appears that for both categories of workers, a job in the family business is a way to help gaining some labour market experience after school. Both transition matrices show high mobility across states for both groups of workers,

**Table 4a**

**Labour market transitions for unskilled youths**

Activity last year	Activity current year (% of last year)							
	Self employed	Family business	Employee	Apprentice	Unemployed	In training	Inactive	Total
Self employed	13.75	1.14	15.03	5.25	4.31	56.32	4.19	100
Family business	3.08	16.43	7.45	7.93	2.68	56.84	5.59	100
Employee	0.79	1.49	58.84	3.57	7.56	24.33	3.42	100
Apprentice	0.44	0.88	27.64	53.20	8.08	5.93	3.84	100
Unemployed	0.89	0.16	26.66	1.91	23.13	38.10	9.15	100
In training	0.19	0.68	5.41	2.74	6.41	81.69	2.88	100
Inactive	0.25	0.59	18.54	5.51	8.72	25.17	41.21	100

**Table 4b**

**Labour market transitions for skilled youths**

Activity last year	Activity current year (% of last year)							
	Self employed	Family business	Employee	Apprentice	Unemployed	In training	Inactive	Total
Self employed	30.69	2.98	48.44	0.86	1.45	13.77	1.79	100
Family business	7.61	18.79	42.03	4.51	0.56	25.47	1.02	100
Employee	1.53	1.22	82.41	0.80	4.10	6.90	3.05	100
Apprentice	1.12	0.50	65.58	12.96	6.93	4.41	8.50	100
Unemployed	0.74	0.35	49.14	1.85	19.89	22.27	5.77	100
In training	0.71	0.71	20.24	1.58	6.78	65.26	4.71	100
Inactive	1.06	1.17	54.76	3.42	5.86	20.03	13.70	100

but the main transition for skilled workers is toward employment if they were already employees or self-employed in the previous year. Unskilled youths, on the other hand, exhibit lower mobility than skilled ones, especially if the previous state was “training”.

Employment is tougher for unskilled workers. They will end up unemployed almost twice more often than skilled employees. People in training will mainly stay in that state, but skilled youths have better prospects toward being employed in the following year. Unemployment in a given year is the major factor explaining unemployment the following year. Still, one out of two skilled unemployed workers finds a job in the subsequent year. The proportion is about one out of four for unskilled workers, whose main other transitions are towards training or staying unemployed. Finally, inactive individuals have a high probability (one out of two) of turning employed in the following year when skilled. Most unskilled youths remain inactive (about 40%) and only one out of five ends up employed. It

cannot be excluded that the negative signal associated with inactivity is stronger for unskilled than for skilled workers.<sup>8</sup>

If we separate the transition tables in two periods (before and after 2003), the subsamples become too small to say anything robust. Instead we make use of a logistic model to assess more accurately the probability of unemployment.

**Table 5** Logistic regression model of unemployment probability

	Unemployment probability <sup>a</sup>			
	1991–2002	2003–2008		
School leaver <sup>b</sup>	0.142*** (0.025)	0.200*** (0.022)		
Was unemployed	0.231*** (0.042)	0.257*** (0.026)		
Age	-0.015*** (0.003)	-0.031*** (0.003)		
Female	-0.022** (0.009)	0.007 (0.010)		
Swiss	-0.013 (0.012)	-0.055*** (0.011)		
Unskilled	0.053*** (0.017)	0.069*** (0.013)		
Observations	3 186	4 960		

a: The coefficients reported are marginal effects.

b: This dummy variable includes youths formerly in training. Youths who were formerly in an apprenticeship and have dropped out are not included since this profile is quite peculiar (youths in an apprenticeship could be considered as workers).

The results are presented in Table 5. The first two columns are based on the period before 2002 and the last two columns on the period 2003 onward. Quite interestingly, being a school leaver increases the risk of being unemployed which is not a surprise *per se*, but the ratio has increased after 2003. Being unemployed, all other things equal, has the strongest effect on the probability of staying jobless. Being a female is not a major predictor of unemployment. The coefficient is even insignificant after 2003. On the other hand, the Swiss nationality has a sizeable effect on reducing the probability of unemployment only in the second period. Age slightly decreases the probability of unemployment, which is also expected. Being unskilled significantly raises the chances of being unemployed, which is not surprising, and even though there seems to be a worsening of the situation for this group of workers, a formal  $\chi^2$  test could not however reject the hypothesis that there is no parameter change between the two periods.<sup>9</sup> We also computed predicted values for each period and a typical unskilled individual (female, foreign, age = 17) and found a sharp increase in the predicted probability of being unemployed from 0.24 to 0.40. This could be interpreted as

a general worsening of labour market conditions for youths during the second period.

### Skills and wage premia

Another important feature that deserves attention is the wage rate. Indeed, wages depend on many factors such as job security, bargaining power and, more importantly, productivity. As wages reflect so many aspects of a job, one may naturally turn to the analysis of this variable over time in order to get a sense of the relative situation of unskilled workers. In this section, we estimate so-called wage equations, where the dependent variable is a standardized measure of individual wages (the hourly wage rate), and a limited set of explanatory variables. Among the latter, we have the region where the person is employed, the age and the highest degree achieved. In the earnings regressions, the coefficient attached to the education level indicates its wage “premium” with respect to individuals with no schooling, all other things being equal. If these premia have increased over time, it would mean that the situation of young unskilled workers has deteriorated in relative terms.

The problem while comparing returns to education over time is that confounding factors may be at play. The main issue comes from *cohort effects* since individuals are compared at different times. As the SLFS is a rotating panel, the same group of people cannot be observed each year. In order to solve this empirical issue, we run estimation by pseudo-cohort<sup>10</sup>. The estimation procedure provides a large set of estimates based on different characteristics: the age of the individual, the year, and the cohort (the SLFS wave in which a particular age bracket was first observed).<sup>11</sup> In order to make sense of all these parameters, we estimate a model where the dependent variable is the return to education, and the explanatory variables are the above factors (i.e. year, age and cohort) and a piece-wise linear trend with a break in 2003.

In Table 6, we report the results of the pseudo-cohorts estimations over the period spanning from 1991 to 2008. For vocational education, the difference between degree holders and unskilled workers declines for younger workers and then increases for older workers. The gap reaches its trough around the age of 29. This U-shaped pattern could be explained by composition effects, as more productive workers with vocational education tend to pursue education further. The positive coefficient associated to the time trend indicates that the wage penalty suffered by those leaving

**Table 6** **Returns to education, age, cohort and time effects, SLFS 1991–2008**

Variable	Secondary vocational education		Secondary general education	
	Age < 40	Age < 30	Age < 40	Age < 30
Age	-0.0811*** (0.0149)	-0.0849** (0.0336)	0.0032 (0.0196)	-0.0172 (0.0432)
Age squared/10	0.0138*** (0.0028)	0.0146** (0.0069)	0.0017 (0.0036)	0.0060 (0.0088)
Time trend (1991–2008)	0.0200*** (0.0023)	0.0220*** (0.0027)	0.0129*** (0.0043)	0.0152*** (0.0050)
Time trend (2003–2008)	-0.0061*** (0.0009)	-0.0073*** (0.0010)	-0.0061*** (0.0015)	-0.0074*** (0.0017)
Constant	1.1370*** (0.2020)	1.1690*** (0.4180)	-0.1550 (0.2600)	0.0595 (0.5260)
Observations	150	122	150	122
R <sup>2</sup>	0.336	0.360	0.497	0.341

Notes: Robust standard errors in parentheses.

Significance levels: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Not reported: controls for cohorts.

Dependent variable: return to secondary vocational education.

Baseline reference: no degree

the school system without a degree has increased. The rate at which the gap has increased is somewhat smaller in the most recent period.

Turning now to secondary general education (i.e. a high school degree), there seems to be no effect of age on wage premia. This may look surprising as individual estimations seem to indicate that the wage gap between high school degree holders and unskilled individuals increases with age. This pattern is probably due to cohort effects, as older cohorts of high school degree holders earn more. This may be due to composition effects, as the propensity to choose university education for this group has increased over time. The results for the time trend are remarkably similar to those found earlier with vocational education. The wage penalty for unskilled workers has increased over time, but the rate at which the gap has been expanding has somewhat diminished over the most recent period.

### Concluding comments

Youth unemployment may not be a major “problem” in Switzerland, which has a relatively well functioning labour market. However, our paper shows that the issue cannot just be brushed aside, because the minority of unskilled workers are more vulnerable to unemployment and may represent a long-term social cost. The change in Swiss unemployment insurance legisla-

tion (referendum September 26, 2010) includes many necessary financing adjustments, but the harsher special provision for young workers could prove highly detrimental to this unskilled minority. The SLFS data over the last two decades point to some noticeable break around 2003, whose underlying causes are still difficult to determine. The business cycle, the bilateral agreements with the EU granting free movement of labour, technological changes are all potential candidates. Unemployment, designed in various forms, increased more markedly for unskilled youths and seems to plateau at a new higher "natural" level. These workers tend to have more precarious jobs or less desirable working conditions. Transition analysis and a logistic regression model also indicate more resilient unemployment for unskilled youths. Further analysis is still needed. In particular, the role of institutions (unemployment insurance, active labour market policies, industrial or occupational minimum wages) may play a role in aggravating or alleviating young unskilled workers' higher unemployment burden. One interesting question is the driving forces behind this educational gap.

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## Notes

1 Unlike the ILO definition, the official unemployment rate only takes into account unemployed workers who have registered to their regional employment office.

2 Meyer (2006) finds that the proportion of school leavers who enroll in dual

vocational education training is 50% higher in German speaking cantons relative to Latin cantons.

3 We do not observe if the individual is in education or training if she declares a work activity for the years 1991–1995. We indirectly infer this information from the panel dimension by checking

the individual situation in the following years.

4 If young persons increasingly delay their labour market entry due to a general rise in the education level, it could create a statistical artifact whereby the share of active unskilled youth would necessarily increase. We checked whether this could be the cause of the trend by looking at the evolution of the share of active unskilled among all youths (not only active ones), and our conclusion remains unchanged.

5 The reduced confidence intervals from 2002 onwards (due to larger SLFS samples) most probably affect the structural break test, but the difference in means is clearly visible.

6 Although there is no legal minimum wage in Switzerland, many collective contracts include statutory minimum wages which are binding for employers.

7 The six month period is taken as a proxy for long term unemployment for young individuals.

8 Signalling in the labour market refers to observable characteristics which can be used to transmit hidden information on productivity. The main signalling is assumed to be associated to education (Spence, 1973), but other workers' characteristics like the number of unemployment spells or unemployment duration can also be used by employers to infer the worker's ability.

9 Testing for changes in marginal effects is best done with a given profile rather than at the mean values of the explanatory variables. We tried with several profiles and the difference is never significant.

10 See Card and Lemieux (2001) for details. The basic idea is to use age brackets in a given year to define observations and move the age brackets by one year each subsequent year to "recreate" a panel.

11 To get a better idea, we first estimate the model for the age 15–24 years category in 1991. In 1992, it becomes the 16–25 years category. In order to compare returns across years, we introduce the 15–24 years category in 1992. This step is renewed until 2008, which enables us to compare many cohorts and years, with overlapping age categories.