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Good skills in bad times: Cyclical skill mismatch and the long-term effects of graduating in a recession

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ABSTRACT

We show that cyclical skill mismatch, defined as mismatch between the skills supplied by college graduates and skills demanded by hiring industries, is an important mechanism behind persistent career loss from graduating in recessions. Using Norwegian data, we find a strong countercyclical pattern of skill mismatch among college graduates. Initial labor market conditions have a declining but persistent effect on match quality and skill mismatch early in their careers. Match quality of the first employment may explain up to half of the short-term and most of the long-term earnings loss from graduating in a recession.

1. Introduction

There is a growing literature showing that labor market conditions at the time of labor market entry have large and persistent negative effects on careers. For example, recent papers by Kahn (2010) and Oreopoulos et al. (2012) show that college graduates in North America suffer persistent declines in earnings lasting up to 10 years. Similar evidence has been found using data sets from other countries or groups of graduates.[1] Understanding the mechanisms driving these persistent career losses is essential to the design of government employment programs aimed at helping young workers.

While much is known about the overall magnitude and heterogeneity of these highly persistent career losses, less work has been done on the mechanisms driving the losses. It is difficult to explain the persistence in career losses from presumably short-lived labor market shocks. The literature has pointed out that the quality of first job placement is important in explaining the long-term career losses. Kwon et al. (2010) find that those who graduate in booms are promoted faster, even when conditional on proxies for productivity. Oreopoulos et al. (2012) find that a lower quality first job can explain the persistence of earnings losses, but only when combined with search frictions that intensify with age. Hagedorn and Manovskii (2013) and Frühwirth-Schnatter et al. (2012) provide evidence that idiosyncratic match quality is affected by the tightness of the labor market. Closely related to our paper, a recent paper by Altonji et al. (2014) finds that the early careers of higher-skilled majors in the US are less sensitive to labor market conditions at graduation.

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[1] See Oyer (2006) (US), Brunner and Kuhn (2014) (Austria), Kondo (2007), Genda et al. (2010) (Japan) and Stevens (2007) (Germany). Another related strand of literature focuses on the long-term impact of initial labor market conditions facing youth or low skilled workers (Gardecki and Neumark, 1998; Ellwood et al., 1982; Neumark, 2002; Burgess et al., 2003; Raaum and Røed, 2006; Liu et al., 2014). In that literature, there seems to be a consensus that there is a persistent effect of youth unemployment on a worker's career later in life.

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We add to this literature by showing that skill mismatch, which we understand as mismatch between the skills supplied by college graduates and the skills demanded by hiring industries, is another important mechanism behind the persistent career loss from graduating in recessions. We analyze the matching over the business cycle between heterogeneous skills within each cohort of graduates and heterogeneous demand for skills by hiring industries. We define the type of skill supplied as the field of study in college. Mismatch occurs when a worker is matched to an industry that does not value her/his skill, and we operationalize this using relative wage premia across college majors and industries (as such, our paper use a different definition of mismatch than the literature that focus on mismatches in the level of education (Leuven and Oosterbeek, 2011).

That students find jobs in industries they did not train for is in itself not problematic. Presumably, they would only want to do so if this industry offered better career prospects than the industry they trained for, and if new graduates have access to consumption smoothing, school-to-job transitions that are classified as mismatches will be efficient. But if new graduates cannot efficiently smooth consumption, they might be forced to accept jobs that are bad long-term matches. They might not be able to afford 'investing' in a low-paying job of the sort they trained for, even if there are long-term complementarities between schooling and experience. In such a case, mismatch might be inefficient.[2]

Using administrative matched employer–employee panel data from Norway, we first document that, like graduates in many other countries, an average Norwegian college graduate has persistent earnings loss from bad initial labor market conditions. Interestingly, the negative effects are more pronounced among graduates whose fields of study lead to jobs with more cyclical demand, i.e., the private sector. College graduates with degrees aimed at the public sector (education and health) which is more insulated from business cycle shocks, show much less persistence of the initial (and smaller) earnings loss. Using our specification of mismatch (wage premia), we show that there is a strong counter-cyclical pattern of skill mismatch among college graduates entering the labor market. A typical recession, with a rise in the unemployment rate by three percentage points, implies an initial increase of about 30 percent in the probability of mismatch. The effects of the initial labor market conditions on mismatch decline over time but remain highly persistent over early careers, suggesting that some graduates never switch back to the "right" industry.[3] Our results survive a range of the robustness checks including students' timing of graduation and region of graduation relative to the regional unemployment rates.

Establishing the persistence of the effects of graduating in a recession and that our measures of mismatch are counter-cyclical, we followed the literature by using aggregate cohort-region-time level data. To understand how much the negative wage effect can be explained by match quality of the first employment, we exploit the advantage of individual-level data by including individual-level variables to control for match quality of the first employment and compositional changes over the business cycle. We find that both the short- and long-term effects of initial labor market conditions are substantially lower once the match quality of the first employment is controlled for. For instance, the effect on log earnings among men majoring in private-sector fields is reduced by almost one half in the first two years after graduation. Initial local labor market conditions also have a much less persistent effect during the early stages of workers' careers. In comparison, controlling for differences in the composition of graduates over the business cycle alone using proxies for cognitive ability has minimal impacts on the effects of initial conditions. These findings suggest that the cyclical mismatch of college graduates could be an important driving force behind the persistent career loss.

The paper is organized as follows. Section 2 explains our empirical strategy and relates it to the literature. In Section 3 we present our data and situate our sample in the context of the Norwegian business cycle before we provide our results in Section 4, some tests of robustness in Section 5, and concluding remarks in Section 6.

2. Empirical strategy

In this section we describe our estimation strategy to identify the short- and long-term effects of initial labor market conditions on skill mismatch and on a range of other labor market outcomes.

2.1. Estimating the short- and long-term effects of initial labor market conditions

We approximate initial labor market conditions using the regional unemployment rate at the time of graduation. Following Kahn (2010) and Oreopoulos et al. (2012), we use the variations in business cycle conditions across regions within a cohort (above and beyond the regional effects captured by the region fixed effect) to identify the causal effects of graduating in recessions. The outcome variable in period t for a graduating cohort c from region r is determined by the following linear

[2] In an online appendix, we illustrate this in a two-period model in which heterogeneous skills depreciate if not used. In this setting, transitory shocks to productivity can have long-term consequences because of the skill dynamics. In our model, with credit constraints and a minimum level of consumption, mismatch can be inefficient, and there is more such inefficient mismatch in recessions.

[3] In addition, we use an alternative definition of mismatch by using relative worker flows across majors and industries. These results support our main finding for wages in that a typical recession leads to a 9 percent reduction in the average quality of matches.