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What Drives Cohort Effects on the Labor Market?

By *Eva M. Meyersson Milgrom*

Recessions, though temporary, can have long-term effects on workers' careers. Workers who first enter the labor market during a recession receive lower-than-average wages even after the economy recovers and are more likely to become unemployed compared with similar workers who first entered the labor market during a boom, but that is just the beginning of a far more subtle story. Recent findings show that workers who find jobs during a recovery while unemployment is still high do even better than workers who enter at the peak of the business cycle.

These phenomena – known as “cohort effects” – not only puzzle economists but also pose significant problems for economic policy. Cohort effects

can distort workers' labor market participation decisions (e.g., by delaying graduation during a recession); reduce the motivation of workers who entered the market during a recession (e.g., because they cannot catch up to those who came during a boom); amplify or mute the business cycle; and raise concerns about equity (e.g., by increasing the role of luck compared with skill and effort).

The proper policy response to these cohort effects depends on an understanding of their causes; however, economic theories purporting to explain the effects have rarely been tested and compared.

Until recently, empirical studies have focused only

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About The Author

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on how the *unemployment rate* when workers are hired influences their initial wage and their subsequent wage growth. The older studies failed to evaluate the effect of the *employment growth rate* although individual employers' hiring, firing and promotion decisions may depend more on employment growth than the unemployment rate. And promotions, for instance, have important implications for careers and wage growth.

To fill the void, Kwon and Meyersson Milgrom (2007)¹ studied the mechanism(s) behind long-term wage cohort effects, asking how the unemployment rate and the employment growth rate at the time of the labor market entry combine to influence job assignments and promotion speed over the rest of the worker's career.

Their study uses Swedish data maintained by the labor union and employer federation covering virtually the entire private sector from 1970 through 1990. The data build on a panel of personnel records of

all employees and contain information about wages, occupation and ranks across firms and industries for millions of workers and thousands of establishments, including roughly a million episodes of new entry into the labor market. From 1971 through 1981, 78,610 new workers under age 27 entered the labor market as full-time workers. Among them, 37.5 percent are female and 17.2 percent have post-secondary education. Workers' wages and promotions are tracked until 1990, which yields 980,573 worker-year observations. Each worker's career is followed up to 8 years on average and 20 years at maximum.

The central wage bargain was a prominent feature of the Swedish welfare system during the period studied. The labor union and the employer federation negotiated what in fact became a floor for wage setting. Promotion, however, was solely within total control of the employers.

In this study two aspects of the business cycle are analyzed at the time of workers'

entry to the labor market: the employment rate (= 100 – unemployment rate) and the growth rate of employment rate. Figure 1 shows recessions in 1972, 1978, and 1981 and booms in 1975 and 1980.

Who are the Workers Hired ?

Average cohort effects may conflate all sorts of forces at work at the same time. For example, during a recession only the highly educated workers may get hired. During a recession, firms may hire relatively fewer at lower ranks. So the average new workers' quality may fluctuate along the business cycle and drive the cohort effects. Consequently, the composition of workers may differ during different business cycles.

Figure 2 allows us to evaluate the possibility that the composition of workers is the source of the cohort effect. It shows that the pattern of cohort effects is largely unchanged when controlling for starting rank and education, which suggests that, qualitatively, average cohort effects are not

¹ Cohort Effects in Wages and Promotion SIEPR working paper 2007.

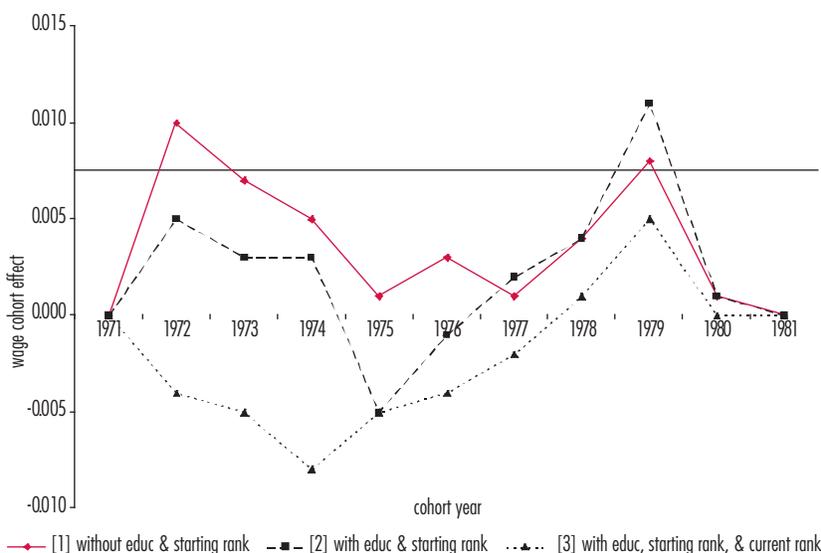
Figure 1: Business Cycle in Sweden (1971–1981)



(Source: OECD)

Note: Employment rate is defined as 100-unemployment rate. Growth rate measures the growth rate of the employment rate.

Figure 2: Cohort Effect in Wages



driven by different composition of workers in each cohort.

What Employers Do

Employer behavior can also influence measured cohort effects. Early studies have shown that firms raise their hiring standard during a recession. So workers who enter during a recession would be expected to receive higher-than-average wages in the long run, not lower-than-average wages.

The third line in Figure 2 shows the cohort effect on wages after controlling for the worker's current rank at the time of wage measurement. Measured in that way, cohort effects in wages do not seem to follow the business cycle systematically. The finding points to the possibility that the business cycle at the time of entry affects workers' long-term wages through the rank the workers achieve, rather than through what workers are paid for the jobs they do. In Sweden, the difference between the highest- and lowest-paid workers within a rank is about 30 percent, yet this variation does not seem to be an important part of the cohort effect.

Similarly, once the worker's current rank is taken into account, the effect of growth rate at the time of entry on long-term

wage growth disappears. And at the same time the effect of *unemployment rate* at the time of entry decreases significantly.

These findings suggest that the business cycle affects workers' long-term wages through the decisions employers make about job assignments and promotions.

Reached Rank and Promotion Speed

Figure 3 shows the cohort effects on reached rank (the solid line), after controlling for

education and starting rank, as well as age and job tenure. Workers reach different ranks depending on the year they entered the labor market. For example, the cohort of workers who entered the labor market in 1972 reaches 0.072 rank higher on average than the cohort of workers who entered the labor market in 1978. (This is a small but still economically significant effect since there are only seven ranks in each occupation hierarchy and because workers get promoted, on average, only

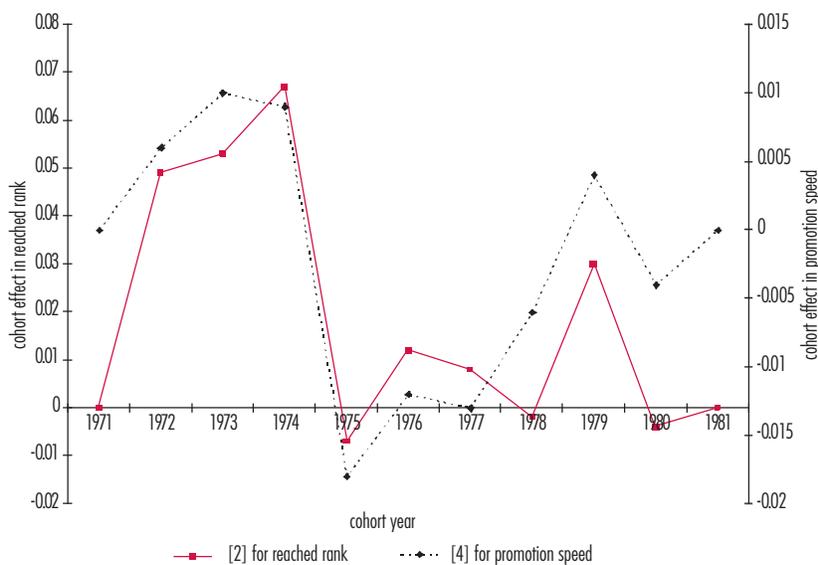
twice in their careers in this population.)

Kwon and Meyersson Milgrom also estimate cohort effects in promotion speed, where promotion speed is defined as the number of promotions² divided by tenure. Figure 3 shows this effect as well (the dashed line). Again, we see a small but significant difference in promotion speed among different cohorts even after controlling for age, tenure, education, starting ranks, etc.

To test whether these differences in promotion patterns among different cohorts are driven by the business cycle at the time of entry, Kwon and Meyersson Milgrom show that employment rate at the time of entry or growth rate at the time of entry alone does not explain the cohort effects in reached rank. However, when both employment rate and growth rate at the time of entry are controlled for, both are significant and explain more than 70 percent of cohort effects in reached rank. If we include the interaction term between

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Figure 3:
Cohort Effect in Reached Rank and Promotion Speed



² We define that promotion has occurred when a worker's rank increases within his/her occupation and when a worker's real wage increases by more than 10 percent when s/he changes occupations.



employment rate and growth rate at the time of entry, 89 percent of cohort effects in reached rank are explained.

These results show that cohort effects in reached rank are indeed driven by business cycle conditions at the time of entry. Both employment rate and employment growth rate matter. A cohort of workers that entered the labor market when employment rate was low but the employment growth rate was high (i.e., the recovery phase in the business cycle) gets promoted to higher ranks than other cohort groups. And there is a similar pattern for promotion speed. A cohort of workers who entered the labor market during the recovery phase in the business cycle gets promoted faster than other cohort groups, even after controlling for age, tenure, education, starting rank, etc. Again, note that employment

rate and growth rate combined explain more than 70 percent of cohort effects in promotions.

Kwon and Meyersson Milgrom's results confirm that career prospects are affected by the timing of when a worker enters the labor market. Workers who enter during a recovery receive higher wages and reach higher ranks in the future, despite the fact that they start at a slightly lower rank than people in a cool-down period. On the other hand, workers who enter during a cool-down period following a boom (high employment level but negative employment growth) are promoted more slowly (as measured by job rank) than other workers. Consequently, these workers receive a lower long-term wage growth.

Finally, there is a stronger cohort effect for low-skilled and high-skilled workers compared

with medium-skilled workers. In summary, labor market cohort effects in wages operate mostly through promotion rates and job assignments.

Although several competing explanations have been offered to account for cohort effects, one seems to account better than others for these empirical findings. The job-matching model predicts that average match quality increases with the scale of the market. At a time of low employment growth, there are fewer new jobs available so the quality of the match is less good than in the recovery phase, when there are more jobs. Since there are typically more hiring opportunities both for firms and for workers during a recovery phase, the matching model offers an account that is reasonably consistent with the empirical results.

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