

[The Cost of Human Capital Depreciation during Unemployment](#)

CFM-DP2014-20

Lien Laureys^{1,2}

¹Bank of England; and ²Centre for Macroeconomics

Unemployment is an important driver of potential supply, and of crucial interest to policymakers for this reason, as well as the effect on the well-being of households. It is well understood that one undesirable aspect is that skills – human capital – may deteriorate as unemployment spells lengthen. This paper analyses how this human capital depreciation affects the efficiency of aggregate labour market outcomes.

The framework of analysis is an otherwise standard model of search for jobs by the unemployed to which human capital depreciation is introduced. Workers who had their human capital eroded while being unemployed are less productive upon re-employment than workers who were not so affected. At the same time, it allows for learning-by-doing such that workers with depreciated human capital can regain skills while being employed.

In the presence of human capital depreciation during unemployment, firms' hiring decisions affect not only the unemployment rate, but also the share of workers with eroded skills in the unemployment pool. Hiring therefore influences workers' chances of finding jobs, average unemployment duration, and thus the extent of skill erosion. For example, when firms hire less, unemployed workers have a smaller chance of finding a job, which increases their unemployment duration. Longer unemployment spells in turn raise the probability that their human capital erodes. As a result, a drop in hiring increases the relative share of job-seekers with eroded skills in the unemployment pool.

In the model, it is assumed that the unemployment pool's skill composition determines how likely it is that job-seekers with or without eroded skills show up for job interviews. Thus, the pool's composition determines the average productivity of job candidates. Consequently, firms' hiring decisions, through their effect on job-seekers' skills, affect the output that can be generated by other firms' new matches. This amounts to a composition externality related to job creation, which arises in addition to the familiar congestion externality following from the search frictions. The composition externality arises because firms ignore how their hiring decisions today affect the unemployment pool's skill composition in the next period, and hence the expected productivity of

other firms' new hires. As a result, when human capital depreciates during unemployment, there are gains from job creation which are not fully internalised.

Insight into the composition externality are provided by analysing the policy instrument that can replicate a hypothetical planner's solution when this externality is the only source of inefficiency, and financing goes through non-distortionary taxation. In the model, the instrument takes the form of a state-dependent employment subsidy implying that because of this externality job creation in the laissez-faire economy is too low in all states of the economy from a social point of view. But the extent to which job creation is too low varies over the cycle. This is because the externality's magnitude, which depends on the impact of job creation on the pool's skill composition, reduces when the share of unemployed workers who already have eroded skills increases. How this externality's magnitude varies over the cycle depends on the dynamic path of human capital depreciation, as this will influence the point in the cycle at which this share starts to increase.

Calibrating the model to the US economy shows that the composition externality is quantitatively relevant. When skill loss is the only source of inefficiency, restoring constrained-efficiency entails a drop in the average unemployment rate in the range of 0.92 to 0.27 percentage points.