



Working hard in the wrong place: A mismatch-based explanation to the UK productivity puzzle



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ABSTRACT

The UK experienced an unusually prolonged stagnation in labor productivity in the aftermath of the Great Recession. This paper analyzes the role of sectoral labor misallocation in accounting for this “productivity puzzle”. If jobseekers disproportionately search for jobs in sectors where productivity is relatively low, hires are concentrated in the wrong sectors, and the post-recession recovery in aggregate productivity can be slow. Our calculations suggest that, quantified at the level of three-digit occupations, this mechanism can explain up to two thirds of the deviations from trend-growth in UK labor productivity since 2007.

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1. Introduction

Since the onset of the Great Recession, UK labor productivity growth has been exceptionally weak. At the start of 2013, output per hour was more than 10 percentage points lower than it would have been if, after 2008, productivity had continued along its trend growth of 1.5 percent per year (Pessoa and Van Reenen, 2014, Fig. 2). Official calculations from the Bank of England reach similar conclusions (Barnett et al., 2014, Chart 1).

While it is not uncommon for labor productivity to decline during downturns, the recent drop has been significantly larger and more prolonged than in any other post-war contractions. For example, six years after the start of each previous recession since the early 1970s, labor productivity was already between 10 and 20 percent higher than its pre-recession level (Barnett et al., 2014, Chart 2). Instead, in early 2013 aggregate labor productivity was still roughly 4 percent below its 2007 level. Because of its unusual magnitude and duration, this shortfall is referred to as the *UK productivity puzzle*.

Standard economic theory based on a constant returns to scale aggregate production function distinguishes three determinants of labor productivity: total factor productivity (TFP), capital deepening, and factor utilization.¹ As documented by Pessoa and Van Reenen (2014, Fig. 14), in TFP terms, the current recession is not so unusual compared with severe

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¹ We note that mismeasurement could be, potentially, important to the extent that investment in intangibles such as expenses on R&D, intellectual property rights, and sales-based capital (e.g., brand names) are not properly captured by official statistics and are countercyclical. However, Barnett et al. (2014) survey the literature and conclude that these sources of output mismeasurement account for at most 1/4 of the missing productivity growth.

recessions of the past: TFP dropped by roughly 4 percent, but then it recovered quickly thereafter. Moreover, while capacity utilization fell significantly in 2009, and could thus be the cause of the sudden drop of labor productivity at the onset of the recession, this explanation is less suited to account for its persistent stagnation and its severity relative to previous recessions. It is quite unlikely that firms would continue to keep their hold on idle workers five to six years after the end of the recession. Indeed, survey measures of capacity utilization were back to pre-recession long-term averages by 2011 in manufacturing, and two years later in services (see, again, [Barnett et al., 2014](#), Chart 6).

The dynamics of the capital-labor ratio hold more promise. [Pessoa and Van Reenen \(2014, Fig. 11\)](#) document that UK real investments, after collapsing by 25 percent during 2008, have remained 20 percentage points below their pre-recession level for the following five years. Their calculations suggest that capital shallowing can account for a large portion of the labor productivity drop. Their preferred explanation for the decline in the capital-labor ratio emphasizes greater wage flexibility. As shown by [Gregg et al. \(2014\)](#), real wages are much more responsive to negative output shocks now than they have been in previous recessions, and this might have induced firms to substitute capital with cheaper labor services. In turn, [Blundell et al. \(2014\)](#) offer an explanation for the unusual dynamics of real wages that occurred in the Great Recession—a decline of 7 percent in four years, compared to a rise of 10 percent, over the same time span, following the downturn of 1990 ([Blundell et al., 2014](#), Fig. 4). They argue that the UK experienced a positive labor supply shock triggered by (i) changes in welfare policies that made work more attractive and tightened job-search conditions attached to the receipt of UI benefits, and (ii) an increase in statutory pension age for women that strengthened their labor force attachment.

The combination of a labor supply shock, downward pressure on a flexible wage structure, and labor-capital substitution to exploit cheaper labor inputs is, currently, the leading interpretation of the stagnation in labor productivity of the British economy. However, it is unclear whether, quantitatively, this rendition can fully account for the data. In this paper we offer an alternative, but largely complementary, explanation for the UK productivity puzzle. We deviate from the one-sector view of the production structure, and instead emphasize the role of labor misallocation across sectors of the economy. Specifically, we extend the methodology of [Sahin et al. \(2014, hereafter SSTV\)](#)—developed to measure mismatch unemployment—to quantify the impact that this misallocation channel has on output and on labor productivity.

To understand the mechanism, consider an economy segmented along many sectors that are heterogeneous in their productivity. Each sector has its own frictional labor market, where the frictions are captured by a sector-specific matching function that takes vacancies (posted in that sector) and unemployed workers (searching in that sector) as inputs, and generates new hires (by firms operating in that sector). To measure sectoral mismatch, we compute the allocation of job seekers across sectors that would be chosen by an output-maximizing planner constrained by the within-sector search frictions, and we compare it to the empirical allocation observed from the data. The gap between the two allocations implies a different sectoral distribution of hires, and therefore, of employment. It also implies a different level of aggregate output, since the planner will allocate job seekers in the sectors with the highest productivity, as long as vacancies are available and the matching frictions are not too severe. As a result, the planner's allocation generates a counterfactual path for aggregate labor productivity. By comparing this counterfactual time-series with the observed one, we can quantify the role of labor mismatch in accounting for productivity dynamics.

The bite of our explanation relies on the existence of gaps in productivity levels across sectors, not necessarily on the presence of differentials in productivity growth. Thus, even if the drop in labor productivity due to capital shallowing is common across all sectors of the economy, the mismatch channel can still contribute to the fall in observed total labor productivity through an adverse change in sectoral composition of employment. Clearly, differential rates of productivity growth can exacerbate the importance of the misallocation channel. Incidentally, [Barnett et al. \(2014, Chart 10\)](#) show that the standard deviation of productivity across industries doubled between 2008 and 2013, and we report similar evidence for occupations in [Section 4](#).

It is useful to emphasize that our explanation is unrelated to the idea that labor productivity is low because the composition of the labor force has worsened. Indeed, [Blundell et al. \(2014\)](#) do not find support for this composition channel. In our model, the reduction in aggregate productivity does not occur because of changes in the pool of jobseekers, but because a disproportionate fraction of new hires occurs in the least productive sectors of the economy (we provide evidence of this pattern in [Section 4](#)).

Our formalizing of output loss from mismatch as “distance from a benchmark allocation” follows the same insights of the vast literature on misallocation and productivity ([Restuccia and Rogerson, 2008](#); [Hsieh and Klenow, 2009](#); [Jones, 2013](#); [Midrigan and Xu, 2014](#); [Moll, 2014](#)). The key difference is that we recognize that an essential feature of the labor reallocation process is that labor markets are frictional, and hence the benchmark allocation—chosen by a fictitious planner—must be *constrained* efficient. This means that the relevant data for our empirical exercise are not just disaggregated employment data, as in most of the misallocation literature, but sectoral-level information on unemployment, vacancies, and matching frictions. While the data requirements for the measurement exercise are more demanding, by using a less extreme benchmark that allows for deviations from competitive markets, the results are, in our opinion, more credible.

We quantify the importance of this misallocation channel by using UK data on vacancies, unemployment, and hires by disaggregated occupational group (2- and 3-digit) over the period 2006–2012. Our definition of sector is therefore an occupation. Our findings suggest that mismatch induced a reduction in both employment and output, and that this decline persisted through 2012. Combining the dynamics of output and employment, we find that occupational mismatch explains about two thirds of the deviations from trend-growth in UK labor productivity since 2007.

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