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Essay

A critical review of the technology-inequality debate

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A B S T R A C T

In the last decades of the 20th Century, a large consensus emerged over the effect of technological change on wage distribution. The core of this theory becomes the backbone of a scientific paradigm that attempts to give an explanation for most of the open issues in currently developed economies, from rising of inequality in the USA to European unemployment, and from the different patterns of productivity to the institutional change. The dawn of this wisdom is reviewed, as well as the research program that consolidated it, with particular focus on the elements of internal coherence. The debate raised by this perspective is discussed and an explanation is presented on how the mainstream analysis was able to resist the critiques and translate itself into a coherent policy agenda. The alternatives approaches are reviewed, showing the lack of coherent framework. The article offers a epistemological point of view, since it shows that the reasons for the success are mainly rooted in the domain of competing scientific approaches.

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Revisión crítica del debate tecnología-desigualdad

R E S U M E N

En las últimas décadas del siglo xx ha habido un gran consenso sobre el efecto del cambio tecnológico en la distribución salarial. El núcleo de esta teoría se convierte en la columna vertebral de un paradigma científico que intenta dar una explicación a la mayor parte de las cuestiones abiertas en las actuales economías desarrolladas, desde el aumento de la desigualdad en desempleo de Estados Unidos a Europa, y de los diferentes patrones de productividad al cambio institucional. Se revisa el surgimiento de este conocimiento, así como el programa de investigación que lo consolida, con especial atención a los elementos de coherencia interna. Se trata el debate que surge desde esta perspectiva y se presenta una explicación de cómo el análisis de la corriente principal fue capaz de resistir las críticas y traducirse en una agenda política coherente. Se revisan abordajes alternativos, mostrando la falta de un marco coherente. El artículo ofrece un punto de vista epistemológico, desde donde se muestra que las razones del éxito se originan principalmente en enfoques científicos en competencia.

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This paper reviews a large amount of literature over the analysis of wage distribution in the United States. Its main novelties stand in that it puts together three or four strands of literature that usually are kept distinguished, and also in that the bottom line is epistemological.

In fact, the last decades were the dawn of a transatlantic consensus in the academy (Atkinson, 2001) over the diagnosis, causes, and solutions for the raise of inequality. The seeds for this theoretical hypothesis are rooted in the debate over the role played by technology in shaping US wage distribution. This research program becomes from the very beginning a self contained paradigm, where the direction of investigation was that of the normal science (Kuhn, 1962), i.e. devoted to overcome the difficulties without questioning the assumptions over which the paradigm itself was built.

The main consequence was the ability to translate this theoretical framework into a discourse highly influential in the political debate, both in the US and in Europe. Even though the use of alternative frameworks of analysis is now widespread inside the literature and, as we will see, some of the critiques are actually decisive, no coherent and influential agenda emerged from them.

The paper is organized as follows: the following section reviews the prodromes of the normal science, the empirical analysis of the data based on the paradigmatic theoretical framework; section III describes the paradigm; section IV presents the critiques based on empirical problems; section V presents the alternative explanations advanced, and finally, section VI concludes.

The beginning of the story: some empirical analyses

At the beginning of the nineties, it was already clear that wage inequality was rising. Katz and Murphy (1992) analyzed data for the period 1967-1987, using a sample from March CPS. Using a standard Mincerian augmented human capital regression they tried to account for the facts in a standard demand and supply framework. The gender and the black-white gap, the most evident episodes of segmentation in the US labor market, were shrinking, but inequality was rising along other dimensions. The attention was captured by the educational premium, growing fast in the eighties, in a period in which the US, like all the other OECD countries, were facing a change in the composition of demand raising the educational level.

Topel (1997) shows that the share of college educated in the labor force jumps from thirty to forty percent in a decade (the eighties). At the same time, Katz and Murphy (1992) obtained that the skill premium decreased during all the seventies (they indicated a log change, multiplied by 100, from 1971 to 1979 of -10.4) and increased during the eighties (12.4 from 1979 to 1984). The total effect is positive (5.4 from 1967 to 1987). How can the two stylized facts, a raise in the relative wage and a decrease in relative scarcity, be reconciled?

In a standard demand and supply framework, as the one explicitly taken by Katz and Murphy (1992), the parallel increases in wage and supply can be justified only

in presence of a demand shift. That paper put together as possible explanations the globalization with a specialization effect (favoring skilled labor intensive products), a possible preference evolution towards more skilled intensive productions generating a sectorial reallocation and finally a technological drift favoring educated workers (skill biased technological change, i.e. innovative activity favoring the relative productivity of skilled workers). They shared the view that a sort of long movement of labor demand towards highly educated labor was in place.

According to Juhn et al. (1993), the stylized facts should be correctly identified. In their words (Juhn et al., 1993:412):

“Our conclusion is that the general rise in inequality and the rise in education premia are actually distinct economic phenomena.”

As they said, there is a timing problem: the increase in within group wage inequality leads the increase in education premium by a decade. Secondly, the between group inequality seems to account for only one third of the overall inequality. Of course, since the setup is the same, they accepted a thesis of a demand shift favouring skilled workers.

The novelty of the picture was the contemporaneous presence of an increase in dispersion and a stagnation of the mean: a polarization of the labour market that was destroying the middle class jobs. According to Levy and Murnane (1992), which reviewed the literature over the eighties, this was the historical curiosum that drove back the attention over inequality.

A large strand of literature tried to pass from the description to the assessment of the alternatives. Bound and Johnson (1992), for example, used various measures to decompose the changes according to the contributions of tastes, trade, institutions, and technology. The latter was indicated as the main factor, but the explanation appears methodologically weak. The approach followed is that of treating technology as the residual, so weaknesses of other explanations immediately becomes its strength, but identification does not occur because of a standard problem of omitted variables. Quoting Bresnahan (1999), technology becomes a Rorschach bolt in which you can see what you want.

Apparently, stronger evidence in favour of technological determinants comes from some other studies: Berman et al. (1994), Berman et al. (1998), and Machin and Van Reenen (1998). The first one constrained the analysis to the US, while the other two analyze other OECD countries in order to control for different institutional frameworks, but all of them are limited to the manufacturing sector. This last choice has a positive and a negative consequence: on the one side it is possible to address explicitly the innovative activity, e.g. through measures of R&D expenditure, on the other side, it may raise problems of generalization.

Berman et al. (1994) assessed the role played by technology using both a decomposition technique and a standard regression framework. The authors are particularly interested in comparing the effects of trade and technical change. They suggest that the strong correlation between the within

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