

Why did Wicksell change his mind about the machinery question?☆

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Abstract

The article investigates Wicksell's change of mind about the machinery question between 1890 and 1900/1901. Wicksell at first sided with the so-called "compensation theory" that workers are not harmed by the introduction of machinery. In his lecture notes of April 1900, made available here for the first time, Wicksell deployed marginal productivity theory to discuss the effects of labour-saving technical progress, with inconclusive results. Finally, in his published 1901 *Lectures* and in his 1900 article about marginal productivity, Wicksell claimed that the introduction of machinery increases output and reduces wages. His analysis was based on the demonstration that free competition maximizes output, but not total utility. It is argued that Wicksell's change of mind and his mature formulation of the machinery question result from his critical assessment of the then new concept of Pareto optimality, together with his reinterpretation and rejection of Ricardo's (1821) contention that the introduction of machinery may diminish output and employment.

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Resumo

O artigo investiga a mudança de opinião de Wicksell sobre a questão da maquinaria entre 1890 e 1900/1901. Wicksell inicialmente se aliou à "teoria da compensação" de que os trabalhadores não são prejudicados pela introdução de maquinaria. Em suas notas de aula de abril de 1900, tornadas disponíveis aqui pela primeira vez, Wicksell empregou a teoria da produtividade marginal para tratar dos efeitos do progresso técnico poupador de trabalho, com resultados inconclusivos. Finalmente, em suas *Lectures* de 1901, Wicksell argumentou que a introdução de maquinaria aumenta o produto e diminui salários. Sua análise se baseou na demonstração de que a livre concorrência maximiza o produto, mas não a utilidade total. O artigo mostra que a mudança de opinião de Wicksell e sua formulação madura da questão da maquinaria resultaram de sua avaliação crítica do então novo conceito de ótimo de Pareto,

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juntamente com sua reinterpretação e rejeição do ponto de Ricardo (1821) de que a introdução de maquinaria pode diminuir produto e emprego.

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Palavras chave: Wicksell; questão da maquinaria; Ricardo; livre concorrência; ótimo de Pareto

1. Prologue: from Ricardo's machinery to Pareto's optimum

The question of machinery's benefit or harm to workers was extensively discussed by classical economists living through the Industrial Revolution, especially after the publication of [Ricardo's \(1951 \[1821\], chapter 31\)](#) new chapter "On Machinery" in the third edition of his *Principles*. The "machinery question" ([Berg, 1980](#)) caught also Karl Marx's attention, until it receded into the background during the neoclassical era. It came to the foreground again in the interwar period, when the impact of technological change on employment and wages became an important topic of debate ([Gourvitch, 1966\[1940\]](#); [Woirol, 2006](#)). Part of the interwar literature was influenced by or reacted to [Wicksell's \(1958 \[1900\], 1934 \[1901,1911\], 1958 \[1913\]\)](#) criticism of Ricardo's argument that the introduction of machinery may bring about a reduction in the levels of output and employment. In the same vein, Wicksell's restatement – in terms of the then new marginal productivity distribution theory – of Ricardo's result that labour saving technical innovation would cause wages to fall also proved influential (see e.g. [Kaldor, 1932](#); [Hicks, 1932](#)). Indeed, Wicksell gave the first treatment of the machinery question that went beyond Ricardo's original analytical framework (see e.g. [Rashid, 2008](#)).

Wicksell's careful discussion of the effects of technical change on distribution and employment was rare among contemporary neoclassical economists. However, it was only gradually that Wicksell came to formulate the problem in the form eventually presented in his 1901 *Lectures* and in his 1900 article about "marginal productivity as the basis of distribution in economics". The topic had attracted [Wicksell's \(1890\)](#) attention from the very beginning of his work as an economist, but on that occasion he had not yet developed his contribution to marginal productivity theory. Instead, Wicksell then sided with the so-called "compensation" approach to machinery, and, accordingly, denied any permanent perverse effects of technical change on employment and wages.

It was in his lectures delivered in Lund in April 1900 that Wicksell applied, for the first time, marginal productivity concepts to the study of technical progress. Nevertheless, his lecture notes still bore the marks of his interpretation advanced ten years earlier, as Wicksell could not make up his mind whether labour-saving technical progress reduced or increased output and wages. A few months after delivering his Lund lectures, Wicksell's ambiguity gave room to a clear argument that the introduction of machinery under free competition would cause wages, but not output and employment, to fall ([Wicksell, 1958 \[1900\]](#)). Wicksell's initial vagueness reflected to some extent the general difficulty in interpreting what Ricardo "really meant" in the new chapter 31, shared by several commentators before and after him (see e.g. [Schumpeter, 1954](#), pp. 679–687).

The goal of the present paper is to discuss how Wicksell resolved the confusion in his own mind. In order to carry out the discussion, Wicksell's lecture notes are translated and reproduced below as [Appendix](#). Wicksell's final statement of the machinery question is only partly explained by his application of marginal productivity theory. Another important factor behind Wicksell's new approach was his critical interest on [Pareto's \(1894, 1964 \[1896–1897\]\)](#) claim that free competition leads to the maximum of satisfaction (*maximum d'ophélimité*) in the economic system, which contradicts some results of chapter 31 of Ricardo's *Principles*.

[Wicksell's \(1958 \[1897–1899\]\)](#) first reaction to Pareto's proposition appeared in his reviews of volumes 1 and 2 of the *Cours*, with no reference to the machinery question though. After [Pareto \(1971 \[1909\]\)](#) developed in more detail what would become known later as the "Pareto optimum" concept, [Wicksell \(1958 \[1913\]\)](#) would discuss in his review of the *Manuel* the apparent contradiction between Ricardo's machinery question and Pareto's optimality. The point came up in [Wicksell's \(1958 \[1900\], 1934 \[1901,1911\]\)](#) contention that Ricardo's objection was "theoretically untenable" under free competition because it conflicted with the technical conditions of optimum production. Those marginal conditions were put forward for the first time by [Wicksell \(1958 \[1900\], 1934 \[1901,1911\]\)](#), as part of his refutation of the notion that the introduction of machinery could reduce output. From Wicksell's new perspective, the machinery question made clear the distinction between the conditions to maximize aggregate output and to maximize satisfaction for consumers as a whole. That distinction was instrumental in his critical interpretation of Pareto's optimality concept.

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