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Creative destruction of inequality

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Abstract

It is often claimed that technological progress is a major driver of rising income inequality. The gap between rich and poor increases as a result, whereby "poor" is usually associated with "workers" and "rich" with "capitalists". However, the interdependences are more diverse. While technological progress – through increased demand for skilled labour – may lead to an increase in personal income inequality, it may contribute to a reduction in functional income inequality (between labour and capital).

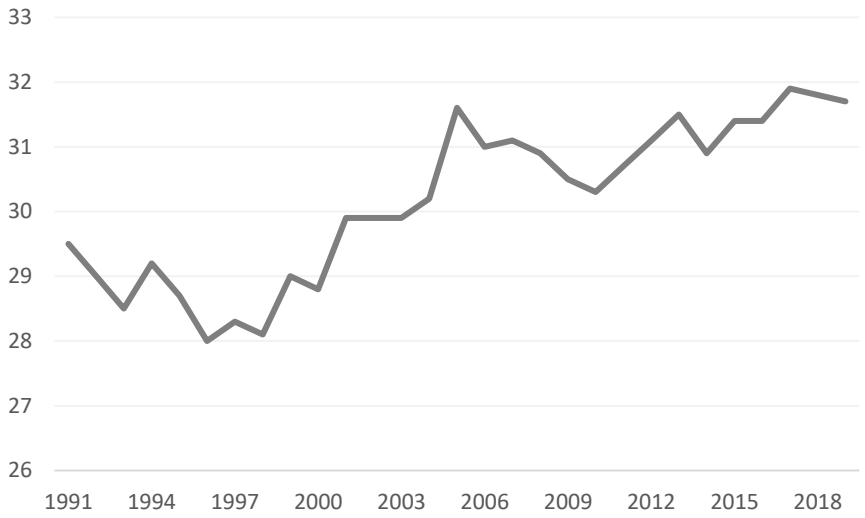
Zusammenfassung

Oft wird behauptet, technologischer Fortschritt sei ein wesentlicher Treiber einer steigenden Einkommensungleichheit. Die Schere zwischen Arm und Reich steige dadurch, wobei „Arm“ meist mit „Arbeitern“ und „Reich“ mit „Kapitalisten“ assoziiert wird. Die Wechselwirkungen sind jedoch vielfältiger. Während technologischer Fortschritt – durch eine erhöhte Nachfrage nach qualifizierten Arbeitskräften – zum Anstieg der personelle Einkommensungleichheit führen mag, kann er jedoch zur Verringerung der funktionalen Einkommensungleichheit (zwischen Arbeit und Kapital) beitragen.

The common interpretation of rising income inequality

The Gini index is usually used to measure the distribution of income in an economy.[1] According to the World Bank, this index tended to increase in Germany between 1991 and 2019 (**Fig. 1**).

Figure 1. Gini index of income distribution for Germany, 1991-2019



Source: Flossbach von Storch Research Institute, Macrobond

This rising trend in the Gini index is often interpreted as the result of the inequality-driving force of technological progress. The explanation of more inequality through technological progress is seductively simple. New production technologies lead to the replacement of labour by capital. People lose their jobs because many of their tasks could be replaced by automated processes. The owners of the automata, the capitalists, profit.

At first glance, the hypothesis may sound convincing. It is enough to think of the rise of the capitalisation of today's technology giants on the stock market.

[1] The calculation of the Gini index is based on the so-called Lorenz curve. The latter represents graphically how many percent of the income recipients in an economy earn what percentage of the national income. If the distribution of income were perfectly equal, the Lorenz curve (which measures the actual distribution of income) would lie exactly on the diagonal. The more unequal the income distribution, the lower the Lorenz curve hangs. The Gini index is the ratio of two areas: in the numerator, the area between the diagonal and the Lorenz curve; in the denominator, the area under the diagonal and the X-axis. The index can assume a value between 1 (extreme unequal distribution) and 0 (perfectly equal distribution).

Technological progress also benefits the labour force

However, this interpretation neglects the fact that the Gini index only shows the final result, but not how it came about. In order to be able to assess the effect of technological progress on the distribution, the distinction between the functional and personal income distribution is essential.

With the functional income distribution, national income is allocated to the factors of production involved in the production process - labour and capital. In this way, the wage share can be determined, which measures the share of employee compensation in national income. This is contrasted with the income share of the owners of capital.

Personal income distribution, on the other hand, allocates income to individuals - regardless of whether it comes from dependent labour or capital ownership.

Technological progress has a considerable influence on the distribution of income among personnel. In particular, skill-biased technological change leads to skill-intensive innovations, which lead to a redistribution of wages in favour of skilled personnel. The less skilled workers may also benefit, for example, if the highly skilled increase their demand for the services of the less skilled (babysitting, delivery service or entertainment) or if they receive higher returns from their stakes in innovative companies. This notwithstanding, the skilled get the lion's share of the income generated by innovation. The so-called college premium, which measures the wage gap between skilled and less skilled workers, increased by over 25 per cent in the US between 1979 and 1995.

Looking beyond the horizon to the pioneering analysis of Joseph Schumpeter reveals further aspects of income redistribution. According to Schumpeter, technological progress affects income inequality by reducing differences in the functional distribution of income from capital ownership and labour. For him, entrepreneurship and its innovative power play an essential role. The introduction of innovations, especially if they are radical, unleashes forces of creative destruction that can destroy parts of the existing capital that have been rendered obsolete by the innovations:

> *"Not only in that epoch, however, which did not yet know the beginnings of this social process, but even today, the entrepreneurial function is not only the vehicle of continual reorganisation of the economy, but also the vehicle of continual change in the elements of which the upper strata of society are composed. The successful entrepreneur rises socially, and with him his own, to whom the results of his success give a basis not directly dependent on personal activity. This rising represents the most important uplift in the capitalist world. Because it takes place in the way of the downward competition of old enterprises and thus also of the livelihoods linked*

to them, it always corresponds to a process of decline, of declassification, of elimination. [2]

"*The upper classes of society alone resemble inns, which are always full of people, but always different ones* (...)." [3]

The shareholders of incumbent firms, squeezed out of product markets by new ones, suffer losses that reduce their wealth.[4] Technological progress is therefore able to reduce income asymmetries between labour and capital by equalising the distribution of wealth:

"*Not only, therefore, because every individual entrepreneurial profit dries up and the mechanism of the competitive economy does not tolerate any permanent surplus value, but rather destroys it through the very stimulus of* the *striving for profit which is its driving force; but already because in the normal case things proceed in such a way that the success of the entrepreneur is concretised in the ownership of a business and this business tends to be continued in a circular fashion by the heirs until new entrepreneurs displace it.*"[5]

The healing effect of creative destruction is all the stronger, the more radical the innovations are and the more often they are generated by "newcomers" instead of established companies. According to Schumpeter, innovators consist of "*people who are recruited from the depths to a much greater degree than many of us would like to admit.*"[6] For example, the emergence of new information and communication technologies and biotechnologies since the second half of the 20th century was primarily the result of dynamic start-ups. Just think of Bill Gates, Steve Jobs, Jeff Bezos - or in the 21st century, the Sahin couple.

The radical innovations of fresh entrepreneurs are indeed the secret recipe to challenge and even drive out the established and experienced entrepreneurs from the market. This is because the market entry of innovators leads to an increase in market rivalry and a reduction in barriers to entry. This siphons off additional profits and shortens the duration of monopoly rents of incumbents. Reducing the level and duration of monopoly rents reduces dividends paid to incumbent shareholders and thus income inequality.

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[2] Schumpeter, J.A., 1911, *Theory of Economic Development*, Berlin: Dunker & Humblot, 7th edition p., 238.
[3] Ibid, p. 239.
[4] Antonelli, C. and Gehringer, A., 2017, Technological change, rent and income inequalities: A Schumpeterian approach, Technological Forecasting and Social Change 115, pp. 85-98.
[5] Schumpeter, J.A., 1911, *Theory of Economic Development*, Berlin: Dunker & Humblot, 7th edition, p. 238.
[6] Ibid, p. 239.

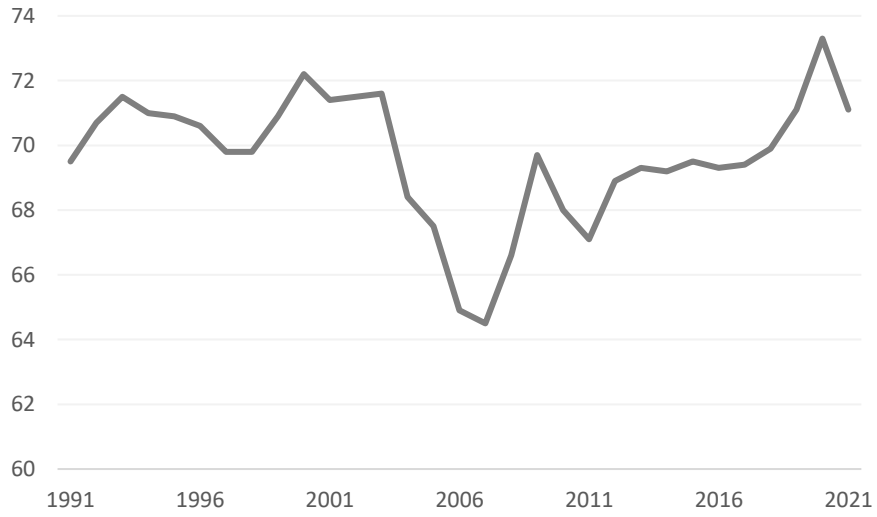
Finally, technological progress also affects the remuneration of labour. This is because technological progress contributes to the improvement of labour productivity:

> *"Certainly, the means of production produced have the capacity to serve for the production of goods. One can even produce more goods with them than without them. And these goods also have a higher value than those that could be produced without the means of production. But this higher value must also result in a higher value of the tools of production, and this in turn in a higher value of the labour and land inputs used*."[7]

This not only increases wages, but also workers' savings, which can be invested in equity. This leads not only to a broader distribution of income, but also of wealth.

The development of the wage share in Germany, at least after the Great Financial Crisis, seems to suggest that this mechanism could be at work. The ratio has increased from 65% in 2007 to 71% recently (**Fig. 2**). In relation to the entire period since 1991, during which the Gini index has also risen, the wage share has moved sideways.

Figure 2. wage share (as % of national income) in Germany, 1991-2021



Source: Flossbach von Storch Research Institute, Federal Statistical Office

So if income inequality – as measured by the Gini index – has risen in recent decades, it does not simply mean that capitalists have become richer. Through the forces of creative destruction, technological progress may well contribute to more rather than less equality in the functional distribution of income.

[7] Ibid, p. 262

However, creative destruction can only contribute to healing provided it is actually creative, i.e. it takes place through innovation. Without innovation, destruction is destructive. Through depreciation alone, the economic value of the capital stock accumulated in the past becomes less and less. As the income of the owners of capital decreases, so do the wages of labour. A struggle for the distribution of losses begins, in which the owners of capital try to pass on their losses to the labour force. Karl Marx spoke of ruinous competition and the impoverishment of the proletariat. But who wins this struggle is eventually unclear.

On the other hand, the slowdown in productivity growth due to a lack of effective implementation of innovations since the 1980s is undisputed.[8] Destruction was destructive instead of creative because it lacked fuel in the form of innovations. This in turn could explain why the wage share has only moved sideways on average over the last three decades.

Drivers of inequality beyond technological progress

Of course, other influences are also driving income inequality. These include globalisation, the financialisation of the economy and pervasive inflation. Financialisation - the inflation of the financial sector - enables financial returns without creating real value and innovation.[9] There is a concentration of financial assets. Through the years of low interest rate policies, central banks have inflated the valuation of financial assets and contributed to this concentration of wealth.

Technological progress is therefore not a panacea for lower inequality. But it helps to reduce it. Unfortunately, this is too often overlooked.

[8] See Akcigit, U. and Sina, A., 2021, Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory, *American Economic Journal: Macroeconomics* 13(1), 257-298, and Antonelli, C. and Gehringer A., 2017, Technological change, rent and income inequalities: A Schumpeterian approach. *Technological Forecasting and Social Change* 155, 85-98.

[9] Mayer, T., 2018, Auf dem "Dritten Weg" in die "Finanzialisierung", Flossbach von Storch Research Institute, presentation at the Federal Commission on European Financial Market and Monetary Policy of the CDU Economic Council, Berlin, 1 February 2018.

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