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Working Paper

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Working Paper, No. 101/2018

Provided in Cooperation with:
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Suggested Citation: Herr, Hansjörg (2018) : Karl Marx's thoughts on functional income distribution - a critical analysis, Working Paper, No. 101/2018, Hochschule für Wirtschaft und Recht Berlin, Institute for International Political Economy (IPE), Berlin

This Version is available at:
https://hdl.handle.net/10419/175885

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Karl Marx's thoughts on functional income distribution – a critical analysis

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Working Paper, No. 101/2018

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Karl Marx's thoughts on functional income distribution – a critical analysis

Hansjörg Herr

Abstract
Keynes, following the tradition of Marx, argued that all values are created by labour and profits. However, functional income distribution between wages and profits is explained differently. In Marx's explanation of functional income distribution, wages are given as a basket of goods needed for the reproduction needs of the working class. Profits are then the remaining part of income creation. Given the capital stock, the profit rate can be calculated. The paper shows that Marx's explanation of functional income distribution has several theoretical and practical shortcomings. The Keynesian paradigm in the tradition of the original Keynes provides an alternative. Here the profit rate is given by processes in the financial market, and, among other things, by the interest rate. Monopolistic or oligopolistic structures, following the tradition of Kalecki, can also influence the profit rate. In addition, financialisation can push up the profit rate. Given the capital stock the consumption basket of workers depends on the level of productivity and the profit rate explained in a Keynesian and Kaleckian way.

Keywords: Marxism, functional income distribution, Sraffa, Keynesianism

JEL Codes: B24, B51, E25

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Acknowledgements: For valuable comments and debates I thank Eckhard Hein.

1. Introduction

Since Thomas Piketty (2014) published his "Capital in the Twenty-First Century", inequality has become a key topic in political and theoretical debates. There is consensus that inequality in income and wealth distribution has been increasing substantially throughout the last decades in developed as well as developing countries. How can income distribution and its changes be explained? Different economic paradigms give different answers. Karl Marx was one of the economists pointing out that exploitation, which leads to inequality, is one of the characteristics of capitalist systems. From his perspective, a fair income and wealth distribution is hardly imaginable in a capitalist society. It is fruitful to compare Marx's approach with other economic approaches. Especially interesting in this context is the comparison with John Maynard Keynes, as he also presents a model in which capital is able to appropriate income in spite of the fact that all income is created by labour.

There are two theoretical questions in relation to Karl Marx's work. The most fundamental question is: Why can some people receive income without working? Why does profit exist? It was Marx who first put this question on the table. John Maynard Keynes, however, asked the same question, although his answer is not commonly known. Moreover, Michal Kalecki, who made further noteworthy contributions to this debate, is worth discussing. The paper goes back to the original works of these great economists, quoting some of the key arguments.

At the centre of the discussion in this paper is *functional* income distribution, referring to the division of income into labour income and non-labour income. Here, the latter is called profit and consists of interest, dividends, undistributed profits, and other non-labour income. Of course, the wage share (wages to income) and the profit share (profits to income) add up to one.

A second question is: Why did changes in income distribution happen in recent decades? The answer to this question draws on the different theoretical approaches discussed above. Consideration in this context, however, will be relatively short, as the focus of this contribution is predominantly theoretical, with the main concern being the nuclei of the different paradigms.

In the next section, a short overview of inequality and its development in Western countries is given. Marx's approach to explaining profit is then discussed, including an interpretation of changes in functional income distribution during recent decades. The next section discusses Keynes' answer to the question, as well as Kalecki's contribution. Here, there is also a short interpretation of the development of functional income distribution. This is followed by a brief discussion of how functional income distribution in the neoclassical paradigm is sketched. The final section concludes.

2. A short overview of income distribution and its development

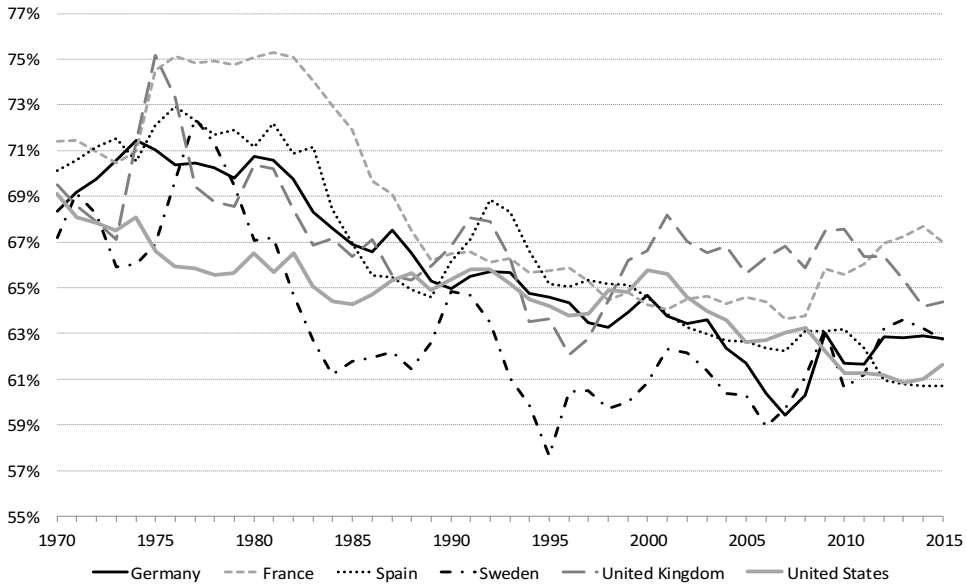
In his empirical work on market income[1], Piketty (2014: 246ff.) showed, for example, that in the United States in 2010, the richest 10% of households received 50% of the national income (20% went to the top 1%) and the bottom 50% received only 20%. He expects that, without

[1] This means before government redistribution policies.

fundamental change, in 2030, the top 10% may receive 60% of the national income (25% going to the top 1%) and the bottom 50% a meagre 15%. Wealth distribution shows even more inequality. In the US, the richest 10% owned in 2010 70% of US wealth (35% was owned by the top 1%) whereas the bottom 50% owned 5%. He expects that in 2030, the top 10% will own 90% of wealth, with the top 1% owning 50%. This concentration of income and wealth in a few hands depends not only, but to a substantial extent on functional income distribution.

Figure 1 shows the development of the wage share, defined as wages to Gross Domestic Product (GDP), as published by the European Commission for a selection of OECD countries. It can be seen that wage shares in developed countries substantially decreased after the 1970s and then stabilised at a lower level from the 1990s on.

Figure 1: Wages in per cent of GDP; selected OECD countries; 1970 – 2015



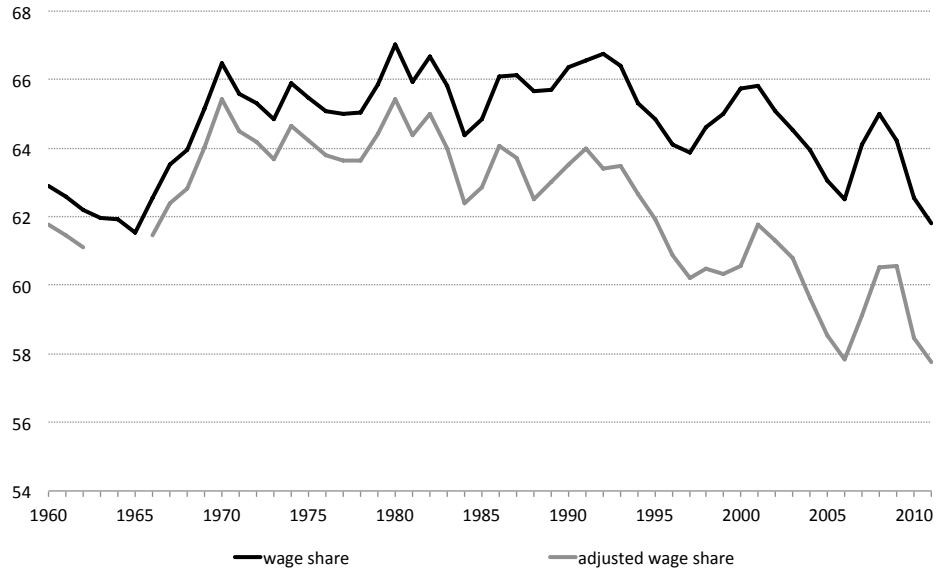
Source: Hein et al. (2017), based on European Commission AMECO database (2016).

Note: The adjusted wage share is defined as compensation per employee as a share of GDP at factor costs per person employed. It thus includes the labour income of both dependent and self-employed workers, and GDP excludes taxes but includes subsidies.

With the wave of deregulation of financial and labour markets, which started in the 1970s and gained speed in the early 1980s, top management salaries, share options, and other profit related elements started to explode, especially in Anglo-Saxon countries. In 2015, CEOs of the Standard & Poor's 500 (S&P 500) Index earned 335 times more than an average nonsupervisory worker and 819 times more than the US federal minimum wage (AFL-CIO 2016). Though these payments are closely related to capital income, in the system of national accounts, they are classified as wages and salaries. Figure 2 shows what happens when the wage income of the top 0.1 % is subtracted from the labour share of national income for the USA from 1960 to 2011. Starting in the 1980s, the wage share in the US, adjusted by top-

salaries, shows a pronounced downward trend, while the original wage share only shows a moderate decline (see Dünhaupt 2011).

Figure 2: US Labour income as a fraction of GDP adjusted by wages of the top 0.1 per cent, 1960 – 2011*



Source: Dünhaupt (2011), based on Alvaredo et al. (2012); The World Top Income Database; BEA NIPA tables.

* Salaries of the top 0.1 per cent wage earners are shifted to profits

The more that wealth is concentrated in a small group of households, the greater the impact a low wage share will have on income inequality. Wealth concentration in capitalist countries is traditionally very high and, since the 1980s, has further increased in Western countries, as shown by Piketty (2014). Together with a falling wage share, these developments added substantially to increasing income inequality.

Income inequality for functional income distribution, as shown above, but also with respect to market and disposable household income, started to increase in the 1980s in almost all Western countries. The regulated type of capitalism, which dominated in the 1950s and 1960s, and which was rooted in US-President Roosevelt's New Deal of the 1930s, included a kind of class compromise between capital and labour. This type of capitalism led to a relatively equal income distribution, compared to the current situation, and relatively high levels of social protection.

In the 1970s, however, the regulated type of capitalism came into crisis. In a number of countries, especially the USA and Great Britain, centre-left of left parties at that time were not able to stabilise the situation and reform the system. In some left movements at the time and part of trade unions higher wages were in the centre of mobilisation. It was assumed that high nominal wage increases could change income distribution. What was missing was a political project to reform the New-Deal type of capitalism in an even more social and democratic form and adjust it to the changing circumstances (for an analysis see Dullien et al. 2011). The

election of Margret Thatcher in 1979 in Great Britain and Ronald Reagan in 1980 in the US signalled the start of deep neoliberal institutional changes, including the deregulation of domestic and international financial markets, the deregulation of labour markets, the deregulation of international trade, and a radically increasing role of outsourcing and global value chains. These changes, together with waves of privatisation and increasing power of multinational companies and global financial institutions, led to a substantial weakening of trade unions. What happened in this period was a conservative revolution, with deep changes in the power relations within society (Harvey 2005).

In particular, agents in the financial system and multinational companies gained power. What developed was not a type of classical neoliberal capitalism stressing the role of competition and limiting the power of companies. Colin Crouch (2015) is right when he speaks about a *corporate neo-liberalism* with a dominant role of multinational companies in almost all fields of the economy. Rent-seeking – in all its different forms – became a key characteristic of modern business (Stiglitz 2012). Eventually all Western countries were affected by these changes.

As mentioned, it is one of the characteristics of this neoliberal, and more market and finance driven, type of capitalism that inequality in income and wealth distribution increased. It is obvious that due to wealth concentration, the richest households earn a large part of their income as capital income. Moreover, there is a cumulative process. The richer a household is, the higher its income, and the higher the income, the more the household can save and increase its wealth (based on the effects of even higher non-labour income). Already, Simon Kuznets (1955) showed that market dynamics in capitalist societies cumulatively increase inequality. He hoped that in more developed societies with higher GDP per capita, political interventions would reduce inequality. The falling part of the so called Kuznets-curve, which first predicts increasing inequality with increasing per-capita income and then falling inequality, is based on this hope. However, from the 1980s on, developments in Western countries showed that the Kuznets-curve does not hold.

Having these developments in mind, let us come to the theoretical explanations of functional income distribution.

3. Functional income distribution in Marx's thoughts

Marx (1867), in Volume I of Capital, distinguishes between labour and labour-power, and develops a theory of exploitation which is built on this difference. *Labour* is the activity of a person in the production of goods (here always including services). Labour creates value and determines the exchange values of goods. Marx follows here the classical paradigm. Adam Smith (1776: 41), the father of the classical school, argued: "If among a nation of hunters, for example, it usually costs twice the labour to kill a beaver which it does to kill a deer, one beaver should naturally exchange for or be worth two deer. It is natural that what is usually the produce of two days' or two hours' labour, should be worth double of what is usually the produce of one day's or one hour's labour." Following the classical paradigm, all values are created by labour. Value is measured by labour-units (hours, minutes, etc.). The value of

intermediate or capital goods which are used in a production process is transferred to the newly produced goods.

Labour-power is the potential of a worker to work. A capitalist hires a worker for a certain period of time and uses his or her labour-power. The key point for Marx is that the price of hiring a worker is lower than the value a worker can produce. The difference between the value created by a worker and the price for his or her labour-power is the surplus value or profit. Given the power of the worker to create a certain value in a given period of time, the surplus value depends on the value of the labour-power. If the value of the labour-power is given, the functional distribution of income can be determined. In a more general context, this implies that the wage share in a country depends on the values created by the working class and the values of the labour-power of the working class.

What determines the value of the labour-power? "The value of labour-power is determined, as in the case of every other commodity, by the labour time necessary for the production, and consequently also the reproduction, of this special article. (…) If the owner of labour-power works to-day, to-morrow he must again be able to repeat the same process in the same conditions as regards health and strength. His means of subsistence must therefore be sufficient to maintain him in his normal state as a labouring individual. His natural wants, such as food, clothing, fuel, and housing, vary according to the climatic and other physical conditions of his country. On the other hand, the number and extent of his so-called necessary wants, as also the modes of satisfying them, are themselves the product of historical development (…). In contradistinction therefore to the case of other commodities, there enters into the determination of the value of labour-power a historical and moral element. Nevertheless, in a given country, at a given period, the average quantity of the means of subsistence necessary for the labourer is practically known." (Marx 1867: 120f.)

This quote shows that Marx assumes a given *basket of goods* or a given *real wage*, which is needed for the reproduction of workers and their families. Given this basket, the surplus is the remaining part of the income created. Or in other words, a worker works part of his or her working time for himself or herself, whereas the remaining surplus-labour produces the surplus or the profit. Here, Marx follows the tradition of Adam Smith and David Ricardo, who also explain functional income distribution by fixing a real wage, i.e. a basket of goods, with the profit as the remaining part of income created.

For Marx, one of the positive and main characteristics of capitalism is its power to increase productivity. The possibility of earning extra profit[2], combined with the danger to lose in the competitive struggle and go bankrupt, create powerful incentives for firms to continuously modify the production process. According to Marx (1867: part 3), the incentive to earn profits and survive in the competitive struggle include efforts such as increasing working time, making work more intensive (viewed as a negative way of increasing productivity), and innovating and using better machines to produce existing and new goods (viewed as a good way of increasing productivity). This process of creative destruction, as Joseph Schumpeter

[2] Extra profits can also be called quasi-rents based on technological or other positions which allow the exploitation of a power source. In comparison to rent for land in a good location a quasi-rent can disappear when, for example, competitors can technologically catch-up.

(1942) called it, is the secret to why capitalism, in comparison to all other modes of production known to date, is so successful in increasing productivity and driving innovation.[3]

The process of *relative value creation* permanently increases productivity and reduces the value of labour-power, which in turn increases surplus. "The object of all development of the productiveness of labour, within the limits of capitalist production, is to shorten that part of the working day, during which the workman must labour for his own benefit, and by that very shortening, to lengthen the other part of the day, during which he is at liberty to work gratis for the capitalist." (Marx 1867: 224) Marx believed that the working class would not benefit very much from productivity increases achieved by the capitalist system. In the Communist Manifesto Marx and Engels (1848) believed in the impoverishment of the working class. Given the extremely bad living conditions of the working class at that time this was understandable. Later Marx (1867: 121) added a historical and moral element to the definition of the physical reproduction basket of workers (Herr 2018).

For Marx, unemployment is needed to guarantee profits. Unemployment weakens the bargaining power of the working class to the extent that real wages remain relatively low and exploitation can take place. There is an endogenous mechanism in capitalism which increases unemployment when real wages become too high. A higher wage share, for Marx, is a double-edged sword; higher real wages increase the living standards of workers, but reduce profits. If profits become too low, the accumulation of capital stagnates. The resulting lower growth rate of GDP, or even recession, increases unemployment back to a level where real wages are low (Marx 1867: part 7).

In this interpretation, the falling wage share over the last decades is the result of a weaker working class. Indeed, the reduced power of the working class since the 1980s is shown, for example, by a decrease in industries with traditionally high union density, a general fall in union density, the deregulation of labour markets, aggressive government policies against unions, the threat and reality of outsourcing, generally higher unemployment rates, etc. (see Herr/Ruoff 2016).

There are several shortcomings associated with the approach of Marx and the classical paradigm in general. First, profits depend on the level of productivity. Higher productivity via relative value creation increases profits. Lower productivity reduces profits. If productivity becomes very low, then profits disappear. In the first model in Sraffa (1960), for example, this situation is modelled. There is no good theoretical argument, however, for why profits would in this way be dependent on productivity (Riese 2002). Also, empirically, in capitalist countries with very low productivity, profits exist – even when the reproduction of workers is not guaranteed.

Second, Marx was too pessimistic about the development of the living standard of the working class. While he mentioned that the degree of civilisation of a country plays a role in determining real wages, he assumed in the end that productivity increases would predominantly benefit capital. As mentioned, in the first half of the 19th century, the living conditions of the working class were very bad and the economic system was extremely

[3] Unfortunately the very effective capitalist productivity machine has a defect. It does not take into account ecological problems as these do not belong to (or are only a very indirect and distorted part of) the incentive system of firms developing new technologies and goods.

unstable. However, towards the end of the 19th century, a more regulated type of capitalism was established. For example, the central bank got the monopoly to issue bank notes[4] and started to understand better how to carry out monetary policy; the Gold Standard was established; the oligopoly of the big London based financial institutions, the so called 'haut finance', stabilised international capital flows and helped countries with financial problems; labour markets became more regulated (ban of child labour, regulation of working time, establishment of social security systems, stronger trade unions etc.). The system was not as regulated as the one following World War II, but it did limit, at least until World War I, some of the regressive implications of capitalism and increased the living standard of the overwhelming majority of the population in the capitalist countries in ways that were previously unthinkable (Polanyi 1944). Marx died in 1883 and did not adjust his theoretical thinking to this historical development.

The third shortcoming is associated with Marx's determination of real wages. Marx and all classical economists, as well as the neoclassical economists who became dominant from the 1870s on[5], believed that real wages are determined in the labour market. They did not take into consideration that in labour markets only money or nominal wages are negotiated. Keynes (1936: 13) argued that the classical and neoclassical paradigm in "assuming that the wage bargain determines the real wage … have slipped in an illicit assumption." And if, for whatever reason, the working class wants to reduce the real wage level, "there may exist no expedient by which labour as a whole can reduce its *real* wage to a given figure by making revised *money* bargains with the entrepreneurs" (Keynes 1936: 13).

A forth and related problem is that Marx struggled with the relationship between the structure of prices and functional income distribution. Advances of capitalists can be divided into variable capital (i.e. wages) and constant capital (i.e. the value of intermediate goods, the means of production, like machines or buildings, etc.). The relationship between constant and variable capital, called by Marx the organic composition of capital, differs among different industries. Given that the relationship between the working time to produce the value of labour and the surplus labour (i.e. the exploitation rate) is equal in all industries, then industries with a high organic composition have a relatively low profit rate (profit to capital invested) compared to industries with a relatively low organic composition. "Owing to the different organic compositions of capitals invested in different lines of production, and, hence, owing to the circumstance that – depending on the different percentage which the variable part makes up in a total capital of a given magnitude – capitals of equal magnitude put into motion very different quantities of labour, they also appropriate very different quantities of surplus-labour or produce very different quantities of surplus-value. Accordingly, the rates of profit prevailing in the various branches of production are originally very different." (Marx 1894: 121) Marx continued to argue that competition would bring down the prices of products in industries with low organic composition and cause increases in the prices in industries with high organic composition. In this way, profits are transferred from one industry to the other so

[4] Before private banks were allowed to issue their own bank notes. This led to a lack of power of central banks to control and stabilise the financial system.

[5] In the 1870s William Stanley Jevons, Carl Menger and Léon Walras became the main economists establishing the neoclassical paradigm which replaced the classical paradigm established mainly by Adam Smith an David Ricardo around hundred years before.

that the same profit rate in all industries is realised. “These different rates of profit are equalized by competition to a single general rate of profit, which is the average of all these different rates of profit.” (Marx 1894: 121) The problem is that by this process, the value of constant capital also must change, as the output of one industry is the input of another. In the next round, this then leads to price changes, profit transfers, and so on. Marx (1894: part II), in his manuscript, struggled over many pages with this problem, but could not solve it, mainly because a system with simultaneous equations was not known to him.

It was Piero Sraffa (1960) who solved the problem in an analytically clear way. According to Sraffa, given the technology in an economy, expressed by input-output relationships of industries, and a physical basket of goods needed for the reproduction of labour, the equilibrium structure of prices, the specific relation between invested capital and wages for each industry, and the general rate of profit can be determined. The problem is, however, for this consistent modelling of the classical paradigm, labour-units are not needed. There is no quantitative relationship between values, measured in labour-units, and prices. Of course, this does not invalidate the assumption that value can only be created by labour. This assumption, however, has no consequence for the prices of goods and the profit rate.

There is one last point. It is almost impossible and completely unrealistic to fix a basket of goods, which is needed for the reproduction of labour. One can argue that given a certain level of animal protection, to “produce” one sheep of around 50 kg, one would need a given amount of hay, water, and shelter. For the reproduction of humans, however, this makes no sense. Baskets of goods are not negotiated and determined in the labour market.

If the real wage is measured in a common unit of account, – let us say we have a world without money and all goods and the price of labour-power are measured in kg corn – then the wage could be determined in kg corn or any other unit of account. Given the price of labour-power, for example in kg corn, the structure of prices and a general profit rate can be determined. However, “when the wage is to be regarded as ‘given’ in terms of a more or less abstract standard” it “does not acquire a definite meaning until the prices of commodities are determined” (Sraffa 1960: 33). This means that the basket of goods, as is the price of labour-power, is only fixed when the structure of prices is determined. Obviously the market mechanism influences the physical basket of goods a worker can consume and it is not possible to fix such a basket before the market starts to work – at least as long the consumption basket for a human is not fixed like the reproduction needs of a sheep.

There is a simple solution to this messy problem: “The rate of profits, as a ratio, has a significance which is independent of any prices, and can be ‘given’ before the prices are fixed.” (Sraffa 1960: 33) Of course for classical economists such a sequence is very strange. Keynes went in this direction. His thoughts will be presented in the next section.

4. Functional income distribution in the Keynesian paradigm[6]

Wages, prices, and profits

It has already been mentioned that Keynes assumed the incontestable fact that *money wages* are negotiated in labour markets. Wage negotiations do not determine wages as a basket of goods or fix wages in units of a physical standard like kg corn. This implies that wages are nominal income for workers, but they are at the same time nominal costs for firms. Prices of goods and services are not independent of costs. Prices at least in the medium-term must cover all costs otherwise firms cannot survive. And increasing wage costs for a whole industry, or even the whole economy, affect prices. For example, when the price of oil increases, companies roll over higher costs; when the value-added tax increases, prices will rise; when import prices increase, the price level will increase; and when the level of nominal wage costs increases, the price level will also increase. If costs for nominal wages fall, the price level will fall as well. The question is then whether the changes in costs and prices are proportional. In such a case, changing wage costs would not affect functional income distribution, but only the price level. In what follows, different market forms are discussed to answer this question.

Wage costs are expressed in nominal unit-labour costs. The latter depend on nominal wages and labour productivity. While rising wage rates increase unit-labour costs, rising productivity reduces them. For example, if output is given, and the wages increases by 6% and productivity by 2%, then unit-labour costs will increase by 4% (see Appendix 1).

In a *partial analysis* of a market for one good, the extent to which increasing wage costs are rolled over depends on the market form. For simplification it is assumed that productivity of all firms in one sector is the same. Under the assumption of *pure and monopolistic competition* in the medium term all costs are rolled over.[7] Most important, in pure and monopolistic competition, entry barriers are low. As soon as high profits are earned in these market types, new firms will enter and bring profits down. Only so called "normal profit" can be earned, which is equal to interest payments. The latter are given by the interest rate multiplied by the amount of capital invested. Implicitly, it is assumed here that equity will earn a rate of return that is at least equal to the long-term interest rate. In a partial analysis under pure and monopolistic competition, increasing wage rates cannot decrease profits. Firms will have to roll over all costs, otherwise they cannot survive. Excess demand is not

[6] There are different streams within Keynesianism. The Neoclassical Synthesis including the Phillips-curve is a mixture of neoclassical and Keynesian thinking. It dominated economic thinking after World War II. This changed with the victory of monetarism and rational expectations in the 1970s and 1980s. The New-Keynesians, as a response to monetarism and rational expectations, accepted rational expectations, but introduced certain distortions like rigid wages or prices, which allowed active macroeconomic policy. New-Keynesians became influential in parallel to monetarism and dominate the economic policy scene. Post-Keynesians are closest to the original Keynesian ideas. For a modern Post-Keynesian model see Herr (2014).

[7] Pure competition means that a homogenous product is produced whereas under monopolistic competition, product diversification takes place – for example different small restaurants offer different types of meals or hairdressers concentrate on different types of customers. In both cases, typically many firms produce and many households demand the good. If only one firm is confronted with higher wage costs, this firm will have difficulties increasing prices. But if the level of wage costs increases in a sector, all firms are affected and prices can be increased easily. See for details the classical works of Robinson (1933) and Chamberlin (1933).

necessary to increase prices.[8] Thus, in the case of pure and monopolistic competition, increasing wage costs do not change the functional income distribution. Given a normal market demand curve, when costs and prices increase the quantity of goods produced in the market and employment decrease.

One may criticise, however, the assumption that there are equal levels of productivity in all firms in a given industry. But this assumption is justified. In pure and monopolistic competition, firms with different productivities – and thus cost constellations – are not very likely to exist long. As market entry costs are low, new firms will enter the market and firms with extra profits will expand production. This will bring prices down and drive firms with lower productivity out of the market, or force them to improve productivity.

In many markets, *oligopolistic structures* or even *monopolies* exist. Oligopolies and monopolies endogenously develop when industries are characterized by economies of scale and scope.[9] In these cases, entry barriers are high because big companies in these industries can produce much more efficiently than small companies. In these markets, oligopoly or monopoly profits which are above normal profits can be earned. Monopolies and oligopolies are confronted with a market demand curve and search for the optimal combination of sold products and prices to maximise profits. Oligopolies can create cartels and can jointly act in the same way as monopolies. Product diversification, marketing activities – such as branding –, non-price competition and the creation of intransparency are among the standard strategies of firms in such markets to increase profits. The more widespread markets with oligopoly or monopoly profits are, the higher the average profit rate in an economy will become, and the lower the wage share.

Michal Kalecki (1965) built his whole profit theory on oligopolistic and monopolistic markets (not monopolistic competition). According to him, the degree of monopoly depends on several factors, which include the degree of economic concentration in an industry, the degree of non-price competition – as for example via advertising –, and the bargaining power of trade unions.[10] The first two arguments are straightforward and influence the shape of the demand curve a firm or a group of firms is confronted with. The third factor is more complicated. When costs increase and firms do not increase prices, profits will decrease. Of course, monopolies and oligopolies have the power to increase prices, but then the demand for the produced products decreases. It becomes part of the profit maximising strategy only to roll over a portion of the increasing costs. How much prices will be increased depends on the demand function the firm is confronted with. The argument with trade union power is along these lines: "High mark-ups in existence will encourage strong trade unions to bargain for higher wages since they know that firms can 'afford' to pay them. If their demands are granted but (...) [the mark-up is] not changed, prices also increase. This would lead to a new round of demand for higher wages and the process would go on with price levels rising. But surely an industry will not like such a process making its products more and more expensive

[8] Under monopolistic competition, firms have the power to change prices. Under pure competition, there is the unsolved problem that for individual firms prices are given. Then it becomes unclear who changes prices if there is no auctioneer.

[9] Karl Marx (1867), following the tradition of Adam Smith (1776), analysed in detail the widespread existence of economies of scale and scope and the tendency in many industries towards oligopolistic structures or monopoly.

[10] Kalecki also mentions overhead costs which include interest and dividend costs. This comes close to the Keynesian argument to explain profits.

and thus less competitive with the products of others industries. To sum up, trade-union power restrains the mark-ups" (Kalecki, 1971: 161; see also Kalecki 1965: 18) Kalecki's argument stresses the importance of the corporate governance system. Under a stakeholder corporate governance system with strong trade unions and a management searching for a compromise between the different stakeholders of a firm, high revenues of firms based on market power are, to a certain extent, shared among trade unions and owners. In the case of weak trade unions, owners and management take all of the revenues as profit and obscenely high salaries.

The conclusion is that in industries with monopolies and oligopolies, in a partial analysis, wage increases reduce profits and increase the wage share. Given a typical market demand curve in a partial analysis, higher wages will also reduce output and employment in the market.

A very special case is a *monopsony*, which is characterized by a monopoly over demand in the labour market, and intensive competition in the goods market (Robinson 1933). An example of this is a firm which has a regional monopoly in the labour market (a steel factory in a small city as a major employer) or has a monopoly for a very specific type of labour (for example demand for specialised engineers). Such firms are confronted with a typical market labour supply curve and can bring down unit costs by reducing output, labour demand and via this process wages. They will search for the profit maximising combination of wage costs and output. If trade unions fix wages at a higher level and prevent that a monopsony can reduce wages by reducing labour demand, unions can destroy the monopsony strategy. The firm will produce more in spite of higher wages and lower profits.[11]

To sum up, the conclusions from the partial analysis, which assumes that increasing wages in a sector do not influence the demand for the product in that sector: When there is pure and monopolistic competition, changes in wages do not lead to changes in functional income distribution. Higher wages under monopolies and oligopolies lead to a redistribution in favour of the wage share under the condition of strong unions which are able to push-up firm level wages and participate on rents these firms can earn. When there is a monopsony, higher wages also can lead to a higher wage share. Under pure and monopolistic competition, and monopolies and oligopolies, higher wages lead to a reduction in production. When there is a monopsony, output can increase with higher wages.

For understanding a general increase in the wage rate and its *macroeconomic* consequences, a partial analysis is not adequate. If all wages in the economy increase by a certain percentage, nominal demand for goods and the market demand curves will, in contrast to a partial analysis, not remain the same. For example, if all wages increase, the price-demand function of a monopoly or a firm under monopolistic or pure competition also will shift upwards. From a macroeconomic perspective, a general increase in all wages leads to an increase in the price level. At least in a closed economy, without taking into account natural resource prices and prices depending on natural conditions like the weather, all real quantities remain the same, including the volume of output and employment, and only the price level changes.

[11] In the debate about minimum wages the monopsony case became famous.

What happens in the Kaleckian approach? If the degree of economic concentration in an industry and thus the monopolistic power of firms increase, prices in the affected industries will increase as well as the profit share. The same happens if the bargaining power of trade unions increases. But also in the Kaleckian approach a general increase of the wage level will increase the price level and keep functional income distribution unchanged. In comparison with general wage increases, changes of monopolistic power of firms and of trade union strength are not very frequent. This is an important argument to explain the overall stable development of functional income distribution that would not exist if general wage developments could influence the wage share.[12]

Keynes (1930) analysed general changes in the wage level in a closed economy without distortions from natural resources, food prices, taxes or demand and supply inequalities. In this context, it can be shown that there is a proportional relationship between changes in the level of wage costs and changes in the price level and no change in functional income distribution. For a more technical analysis of this argument also see Appendix 1. The classical explanation of functional income distribution has no place in the Keynesian paradigm.

There is also an empirical argument that increasing unit labour costs in most cases must be completely rolled over. If, as a general rule, not all nominal unit labour cost increases could be rolled over, the wage share would approach one and profits would be squeezed to almost zero. For example, in France, nominal unit labour costs increased from an index value of 39 in 1978 to 107 in 2017. Unit labour costs in Italy increased from 88 in 1980 to 107 in 2017. Even in Germany, unit labour costs increased from 71 in 1991 to 107 in 2017. In the US, nominal non-farm unit labour costs increased from an index value of 17 in 1950 to 110 at the end of 2016 (Trading economics 2017). If only 80% per cent or 90% of these increases could be rolled over profit shares would have fallen to very low values. But this is not the case.

Determination of the profit rate

Keynes' analysis

Keynes followed the classical paradigm (which he named pre-classical) in advocating that all values are created by labour. "I sympathise, therefore, with the pre-classical doctrine that everything is *produced by labour*. (…) It is preferable to regard labour, including, of course, the personal service of the entrepreneur and his assistants, as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand." (Keynes 1936: 214) Both Marx and Keynes rejected the marginal productivity theory of income distribution.[13]

[12] Empirically there is a surprisingly high correlation between changes in unit-labour costs and the price level in spite of the many other factors which can influence the price level (Herr 2009).

[13] Keynes was aware of Sraffa's (1969) argument that capital cannot be measured without knowing the functional distribution and for this reason the marginal productivity theory of distribution is flawed. "There is, to begin with, the ambiguity whether we are concerned with the increment of physical product per unit of time due to the employment of one more physical unit of capital, or with the increment of value due to the employment of one more value unit of capital. The former involves difficulties as to the definition of the physical unit of capital, which I believe to both insoluble and unnecessary." (Keynes 1936:138)

Keynes also followed Marx (1867) stressing that the so called general formula of capital "Money – Goods – (Money + ΔMoney)" shows the core of the capitalist mode of production. "Money" is advanced by the capitalist in "Goods", capital and intermediate goods and labour, to produce new goods. These goods with now higher value are sold to get "Money + Δ Money" with "Δ Money" as profit. Money is advanced in production processes to get more money back in the future (Keynes 1933; Evans et al. 2007). A high volume of money advances leads to high employment, high value creation and high growth; stagnancy of the volume of money advances shows economic crises.

But there are also fundamental differences between Keynes' and Marx's analysis. For example, in the Marxian paradigm, the wage level, as shown, plays an important role in determining functional income distribution and the profit rate. Wages determine in Keynes' thinking first of all the price level. But how is functional income distribution explained by the Keynesian paradigm? Sraffa (1960: 33), following Keynes, suggests that "the rate of profits (...) is (...) susceptible of being determined from outside the system of production, in particular by the level of the money rate of interest." Interest payments are for firms a kind of cost. "If, however, the rate of interest exceeds zero, a new element of cost is introduced which increases with the length of the process." (Keynes 1936: 216; see also Spahn 2002) These costs have to be covered by prices, otherwise firms go bankrupt. If a firm operates using one hundred per cent borrowed money, the profit rate must be at least as high as the interest rate. If a firm uses (partly) their own capital, there are opportunity-costs. Own capital will thus only be invested if it at least earns a rate of return equal to the interest rate.[14]

Keynes developed a very abstract model to make his point. He assumed that given the uncertainty in general, and especially in a capitalist system, the holding of money (or better liquidity) earns a non-pecuniary rate of return, a so called liquidity premium. The liquidity premium may fall with increasing liquidity holding, but it can hardly become zero and may stop falling at a certain positive level. The liquidity premium determines the interest rate. "The rate of interest obviously measures … the premium which has to be offered to induce people to hold their wealth in some form other than hoarded money." (Keynes 1937: 216; see also Keynes 1936, chapter 17) Or: "If the interest rate is not determined by saving and investment in the same way in which price is determined by supply and demand (…) the rate of interest on a loan of a given quality and maturity has to be established at the level which in the opinion of those who have the opportunity of choice – i.e. of wealth-holders – equalises the attractions of holding the loan." (Keynes 1937b: 250)

Keynes assumed that the rate of return, i.e. the marginal efficiency of capital[15], of all assets that can be reproduced will fall with increasing investment. Investment will increase the stock of all reproducible assets until their rate of return has reached the interest rate. "When there is *no* asset of which the marginal efficiency reaches the rate of interest, the further production of capital-assets will come to a standstill." (Keynes 1936: 228) Keynes also argued that if the interest rates would become very low, then investment in all industries would increase until

[14] In Appendix 1 in the price-setting equation the profit rate is in this simple case determined by the interest rate.
[15] The marginal efficiency of capital has nothing to do with the neoclassical concept of the marginal productivity of capital.

the profit rate has fallen to the low interest rate level and capitalists would not be able to exploit the scarcity of capital any longer.

However, it is not so easy to bring the interest rate down to very low levels. Expansionary monetary policy, which endangers the stability of a currency, is not a solution. Only stable money can function as a store of value for liquidity." Money itself rapidly loses its attribute of 'liquidity' if its future supply is expected to undergo sharp changes." (Keynes 1936: 241 Fn.) Unstable money will be substituted by foreign currencies, or even assets, like gold or land. Of course, the inflation rate can be stabilised at a low level when wages increase according to trend productivity growth and the target inflation rate of the central bank. However, when wage increases and thus the inflation rate are much higher than compatible with the target inflation rate high interest rates may be needed to prevent an escalating inflation. The sad story is that slowing down the economy and creating unemployment is the only mechanism which is available for the central bank to stop a wage-price spiral even if the spiral was not triggered by wage increases. This fact stresses the desirability of developments of the nominal wage level according to macroeconomic needs.

Keynes' approach has some weak points. In his model, private wealth owners have a dominant role. They determine the credit supply via their liquidity preference and also the interest rate, given a certain credit demand. The interest rate then determines the profit rate. In this model, the central bank can influence available liquidity but can fail to bring interest rates to low levels if wealth-owners hoard any additional liquidity. In this abstract model, the banking system is not analysed.[16] Also it is questionable whether profit rates really go down to the level of the interest rate or whether profit rates are systematically higher. Last but not least, the concept of marginal efficiency of capital is not very clear. Keynes does not explain why marginal efficiency goes down with increasing investment. Is it, for example, due to overcapacities and a lack of demand?

There is a second line of argumentation based on Keynes (1930) Treatise on Money. Kaldor (1955) argues that the share of profits in total income is a function of the ratio of investment to income, given the saving rate of wage income and profit income. This argument is based on the notion that higher net investment leads to an increase in the price level –, higher profits and a higher profit share. Keynes' called this demand driven inflation "profit inflation". In a dynamic context, under the assumption of full capacity utilisation, this argument is correct. It does not, however, satisfy a general explanation of functional income distribution. Keynes also did not follow such an argument and analysed profit inflation or profit deflation as phenomena of disequilibrium. The weakness of this model as a general model can be seen when net investment is assumed to be zero. Under this condition, no profit exists – a completely implausible conclusion for a general model.

[16] In other publications, the analysis of the banking system plays a big role (see for example Keynes 1930).

Modern Keynesian analysis

Modern Keynesian approaches give the banking system a prominent role. The central bank's key policy instrument is it's ability to fix the short-term refinancing rate in the money market. The banking system, together with the influence of wealth owners and credit demand, determines the long-term interest rate for credits to firms. This long-term lending rate is always above the refinancing rate in the money market.

Keynes' (1936) argued that the marginal liquidity premium of wealth owners (l) measures the advantage of keeping liquidity to protect oneself in an uncertain world. It determines, in equilibrium, the interest rate (i), and the latter determines the profit rate (q). Thus we get $l = i = q$.

In a modern version, the interest rate (i) depends on the refinancing rate (i_r), which is dictated by the central bank. An interest rate spread of banks (l_r) is added to the refinancing rate to determine the interest rate relevant for the firm sector, $i = i_r + l_r$. The interest rate spread covers the costs and profits of the finance sector, as well as a risk premium. l_r can also cover the influence of wealth owners, if they have an effect on the interest rates. In most financial systems, wealth owners in this respect are relatively weak.

It is more realistic to argue that the interest rate determines the lower limit of the profit rate. For several reasons, which will be discussed below, the profit rate can be systematically higher than the interest rate. In this more differentiated approach, the profit rate will, in the long-run, be systematically higher than the interest rate. If b, expressed in percent, symbolises this difference, the final determination of the profit rate becomes: $q = i + b$ or $q = i_r + l_r + b$.

The question is now what determines the difference between the profit rate and interest rate. There are two explanations which do not exclude each other. First, there might be a convention that the profit rate should be – to a certain extent – higher than the interest rate, in order to reflect the higher risk and efforts of company owners to manage capital. In principle, remuneration of the management function can be considered as wage. But, as mentioned above, management salaries including bonuses increased to such a level that part of management income must be considered as profit income.. Second, in the Kaleckian tradition, the degree of rent-seeking in oligopolistic or monopolistic markets and union power can explain part of the difference. The higher the possibility of rent-seeking and the lower union power the higher will be the difference between the long-term interest rate and the profit rate.

The profit rate and the capital-to-output ratio (the capital coefficient), as dependent variables, determine the wage share. The capital coefficient depends, among other things, on the technology used and on the relative importance of industries with high or low capital-to-output ratios. An increase in the profit rate and the capital-to-output ratio reduces the wage share. For details see Appendix 2.

In the Keynesian approach, real wages become a dependent variable and are determined by the economy wide labour productivity as well as the profit rate and the capital-to-labour ratio (see Appendix 3). The level of productivity and its development, first and foremost, reflects the level of technological knowledge and the qualification of the workforce. This supports the argument that a higher real wage level in the end can only be achieved if productivity can be

increased. The possibility of trade unions to eke out some of the extra profits of firms is included.

Interpretation of the empirical development

In the tradition of Post-Keynesian thinking, the falling wage share after the 1970s can be explained by several factors.

First, increasing profit rates (and with it falling wage shares) is partially explained by financialisation. According to Gerald Epstein (2005:3), "financialization means the increasing of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies." A good example of financialisation is the corporate governance system. If management in big companies search for a compromise between the different stakeholders, owners, workers, lenders, and stakeholders from the local community, including consumers, then the profit rate will be moderate. If management in a shareholder management system tries to maximise profits in the short-term at all costs and is motivated to do so by bonus payments linked to profits, the profit rate will be higher, independent of the level of the interest rate (the b increases in the formula above). In particular, when comparing the description of corporate governance in the US in Galbraith's (1967) Great Society, in which management organised a compromise between different stakeholders and only got decent salaries, with the shareholder value logic advocated by Alfred Rappaport (1986) and Jack Welch, former CEO of General Electric, the paradigm shift becomes clear.

Second, labour market deregulation, shrinking of industries with high union density, and outsourcing strategies by companies reduced the power of trade unions. This means that the conservative revolution in the 1980s increased the power of the financial system and big companies and, at the same time, weakened the power of trade unions. Following Kalecki's argument, this increased the profits, especially in monopolistic and oligopolistic markets, and brought the wage share down.

Stiglitz (2012), without mentioning Kalecki, puts forward a related argument. He stresses that the increasing excessive rent seeking behaviour by companies during the last decades, i.e. through the creation of bigger and bigger companies, an increasing role of brand names for consumers, more and more sophisticated marketing strategies, artificially created non-transparency, opaque pricing systems, or political acceptance and support for very powerful – usually multinational – firms increased mark-ups for many companies and reduced the wage share.

The proliferation of lean production (Womack et al. 1991), including outsourcing of low-tech, labour intensive, low-value adding and ecologically problematic productions from developed to developing countries, increased rent-seeking possibilities. Lead firms in global value chains specialized in high-value adding activities and used their monopsony or oligopsony power to keep profits in supplier companies at a minimum. At the same time outsourcing possibility weakened trade unions and increased the profits further (Milberg / Winkler 2013).

Third, privatisation which after the conservative revolution has been widespread in many Western countries, also reduces the wage share. The explanation is that productions, which

previously only had to cover costs, for example in the field of public utilities, after privatisation have to earn a profit.

Fourth, Piketty (2014: 113 ff.) states that in Western countries the capital-to-output ratio has been increasing slowly since the end of World War II. Given a profit rate which does not seem to fall, this also brings down the wage share. It is worthwhile mentioning here Marx's (1894: part III) "Law of the Tendency of the Rate of Profit to Fall". In this context, he argued: "If it is further assumed that this gradual change in the composition of capital is not confined only to individual spheres of production, but that it occurs more or less in all, or at least in the key spheres of production, so that it involves changes in the average organic composition of the total capital of a certain society, then the gradual growth of constant capital in relation to variable capital must necessarily lead to *a gradual fall of the general rate of profit*." (Marx 1894: 153) Marx argues that increasing labour productivity, as part of relative value creation, has two effects. First, it increases the rate of exploitation, which implies that the relation between surplus value and variable capital increases. And second, the organic composition of capital (the invested capital in relation to the invested wage sum), increases. He assumed that the increase in the exploitation rate would not be sufficient to compensate the increasing organic composition of capital. Marx was too pessimistic about the effects of productivity increases. In the long-term, average real wages increase substantially under a capitalist system. A different question is the development of wage dispersion and the income distribution within the working class and the question of unemployment and precarious jobs. It is an empirical question whether the organic composition of capital increases along with technological development. Also, certain technical progress is imaginable which does not increase the organic composition of capital. In the Keynesian approach, the profit rate and the organic composition are given independent from each other and an increase in the organic composition reduces the wage share without a tendency to reduce the profit rate (see also Appendix 3).

There are a number of empirical investigations that stress the role of the different factors contributing to the fall in the wage share over the last decades. According to these empirical studies, financialisation of the economy plays an important role as well as weaker bargaining power of labour and globalisation processes, for example, in the field of outsourcing (for an overview see Stockhammer 2015; Hein 2015; Detzer and Hein 2015; Dünhaupt 2017).

5. Neoclassical explanation of functional income distribution

The neoclassical explanation of functional income distribution assumes that capital, land and labour, as factors of production, interact together in the physical production process to produce an output good. Each of the factors then receives its fair share of the income created. Already Marx argued strongly against such a theoretical approach. "In capital-profit, or still better capital-interest, land-rent, labour-wages, in this economic trinity represented as the connection between the component parts of value and wealth in general and its sources, we have the complete mystification of the capitalist mode of production, the conversion of social relations into things, the direct coalescence of the material production relations with their historical and social determination. It is an enchanted, perverted, topsy-turvy world, in which Monsieur le Capital and Madame la Terre do their ghost-walking as social characters and at

the same time directly as mere things. It is the great merit of classical economy to have destroyed this false appearance and illusion." (Marx 1894: 599)

John Bates Clark (1899) presented the modern version of this trinity model in the marginal productivity theory of functional income distribution. Assuming only labour and capital as production factors, firms under perfect competition maximise profits when real wages are equal to the physical marginal product of labour and the rate of return on capital is equal to the physical marginal product of capital. In this approach, there is no exploitation of workers. Each factor of production gets its fair share of output. However, as soon as trade unions realise high wages above the market equilibrium level, there will be unemployment.

To explain the falling wage share over the last decades, a specific technological development that privileges capital is assumed. Insufficient investment in "human capital" also contributes to a falling wage share. For example, the OECD (2012) argues that between 1990 and 2007, around 80% of the within-industry decline of wage shares stems from specific productivity developments. "This is consistent with the idea advanced by many studies that the spread of information and communication technologies (ICTs) has created opportunities … for unprecedented advances in innovation and inventions of new capital goods and production processes, thereby boosting productivity." (OECD 2012: 110)

The neoclassical model of functional income distribution relies on very specific assumptions about technology. It only works under the assumption of smooth physical substitution between the different production factors and constant returns to scale. If the last condition is not fulfilled, the sum of distributed wages plus profits is bigger or smaller than the income created in the economy.

Fundamental inconsistencies of the model were revealed during the Cambridge-Cambridge debate in the 1960s. To calculate the marginal product of capital and labour, the stock of capital has to be known as well as the output produced. In comparison to labour which can be measured in hours, capital and output in a world of heterogeneous goods have to be calculated in values. The value of a given stock of capital and the value of the output depend obviously on the structure of prices of goods. But the structure of prices depends on the functional distribution of income. Here, the model is tangled up in a viscous circle; the stock of capital has to be known to determine distribution and distribution has to be known to calculate the stock of capital. An example can make the problem clearer. Starting at an equilibrium with equal profit rates in all industries, and assuming an increasing profit rate[17], it is obvious that real wages will decrease. What is important here is that prices in capital intensive industries will increase more than in labour intensive industries to realise the higher profit rate. In the 'first round', the structure of prices changes. As outputs of one industry are inputs of others, in subsequent rounds (i.e. second, third, etc.), changes in all prices will be triggered. In the new equilibrium, the whole structure of prices will have changed. The new equilibrium can show a lower or higher value of the capital stock – even if the physical capital stock has not changed – (capital reversing is possible) and a lower or higher value of output. In addition, firms may choose a different profit maximising technology which may be more or less capital intensive. Employment can increase with increasing real wages (re-switching). The

[17] If because of monopolies, oligopolies or monopsonies different profit rates exist, we can assume a general increase in the average profit rate.

neoclassical demand function for labour (combining falling real wages with higher labour demand) and the demand function for capital (combining falling interest rates with increasing capital stocks) evaporates. The neoclassical distribution model breaks down. Paul Samuelson (1966: 582f.), one of the most famous US economists after World War II who first wanted to save the model, wrote: "Reswitching … does alert us to several vital possibilities. Lower interest rates … can involve denial of diminishing returns and entail reverse capital deepening … There often turns out to be no unambiguous way of characterising different processes as more 'capital intensive', more 'mechanised', more 'roundabout'." To sum up: The marginal productivity theory of distribution is theoretically not defendable (see Sraffa 1960; Harcourt 1972; Lazzarini 2011).

There is an interesting parallel to Marx's transformation from values to prices and the neoclassical marginal productivity model. Both fail because of difficulties to aggregate physical capital goods to a sum of value. All these problems disappear if the assumption of the existence of only one capital good is made, in other words, that the capital-to-wages ratio remains the same in all industries. It is an irony of economic history that Marx's transformation from labour values to prices and the neoclassical marginal productivity theory of distribution only work when one capital good (or the same capital-to wages ration) is assumed. However, such an assumption is not legitimate as it defines a key problem in economics away. It is a negative heuristic in terms of Lakatos (1978) to protect the core of the paradigm, but leads to its degeneration

6. Conclusions

Karl Marx, as an economist and a philosopher, asked questions which are as important today as during his lifetime. In the field of functional income distribution, he asked why some people become extremely rich without working. He judged capitalism correctly as a class society in which, as in many societies before, a part of the population works for another part of the population. Capitalism is in many aspects the opposite of a meritocracy. Income distribution, he argued, is fundamentally unfair in capitalist societies. And he was very sceptical whether capitalism was able to survive.

Unfortunately, his theoretical work remains unfinished. Volume II and volume III of his main theoretical work "Capital" were published after his death by Friedrich Engels, based on Marx's manuscripts. This stresses the fact that Marx's work should never be used as a bible, but rather as an important contribution to social science.

Marx's explanation of functional income distribution is not the strongest part of his work. Here he remains a child of the classical paradigm. A basket of goods giving the reproduction needs of the working class is defined, and profits are the remaining part of income creation. Implicitly he assumes, as later do neoclassical economists, that real wages are determined in the labour market. From a Keynesian perspective, only money wages are negotiated in the labour market. The real wage level depends on the productivity level of an economy and the profit rate. Wage negotiations can in case of monopolies, oligopolies and monopsonies, under certain conditions, influence the profit rate, but only when wage developments in certain fields differ from general wage development.

Keynes, following the tradition of Marx, argued that all values are created by labour and profits including rentiers income in the form of interest and dividends are an expression of exploitation. Karl Marx was overly pessimistic. He did not expect that labour could gain much during capitalist development. He thought that much of productivity development would increase profits and living standards of workers could not significantly be improved. He saw revolution as the solution to overcome the negative effects of capitalism.

Keynes was probably overly optimistic. He thought that in a mature capitalist system, clever regulations can bring down real interest rates and profit rates to levels close to zero. In such a vision, only profits based on more than average technological advances or other innovations, can be earned by firms for some time. To bring down the interest rate to zero "would mean the euthanasia of the rentier, and, consequently, the euthanasia of the cumulative oppressive power of the capitalist to exploit the scarcity-value of capital. Interest to-day rewards no genuine sacrifice, any more than does the rent of land. The owner of capital can obtain interest because capital is scarce. But whilst there may be intrinsic reasons for the scarcity of land, there are no intrinsic reasons for the scarcity of capital." (Keynes 1936: 376) And: "I see, therefore, the rentier aspect of capitalism as a transitional phase which will disappear when it has done its work. (...) It will be, moreover, a great advantage of the order of events which I am advocating, that the euthanasia of the rentier, of the functionless investor, will be nothing sudden (...) and will not need a revolution." (Keynes 1936: 376) Keynes had in mind a highly regulated type of capitalism, including a highly regulated national and international financial system, heavy government intervention to control the level of investment, and managed income distribution to guarantee sufficient consumption demand.[18] So far, such a type of capitalism has not been established. Moreover, the New Deal, and the regulated capitalism after World War II, was not able and had not the aim to reduce rentier's income to zero. Periods of low real interest rates became periods of crisis and not periods in favour of labour. This is the case during the crisis period of the 1970s and after the subprime crisis which started in 2007.

Policies in favour of increasing the wage share are possible. There are financial systems conceivable which control interest rates. Such controls existed in the past. Examples are the Regulation Q in the United States.[19] Countries like Japan, South Korea, or China, in their phases of rapid economic development, controlled not only deposit rates of banks, but also lending rates. Of great importance with respect to reducing rentier income would also be a comprehensive control of rent-seeking activities, especially for multinational companies. Rents on land should be kept low. Moreover, the return to a more stakeholder type of corporate governance would be helpful in increasing the wage share.

It should further be mentioned that functional income distribution is only one area which determines household's disposable income. Wage dispersion plays a key role for income distribution. Finally, government redistribution policies and the provision of public goods can substantially modify market income distribution (for these aspects see Gallas et al. 2015).

[18] For an economic system going in this direction see Dullien et al. (2011).
[19] From 1933 until 1986 this regulation imposed maximum rates of interest on various types of bank deposits, for example demand and saving accounts.

Appendixes

Appendix 1: Wages and price in the Keynesian paradigm

From national accounting, in a closed economy it is known that national income (Y) is identical to net domestic product. National income equals the wage sum (Ws) plus the profit sum (Q). The latter comprises all non-labour income.

$\mathrm{Y} = \mathrm{Ws} + \mathrm{Q}.$

Nominal income is by definition Yr·P, with P as price level or price index. It follows the definition of the price level (see Keynes 1930; Herr 2009):

$\mathrm{P} = \frac{\mathrm{Ws}}{\mathrm{Yr}} + \frac{Q}{Yr}$

The term $\frac{\mathrm{Ws}}{\mathrm{Yr}}$ defines wages per unit output or unit labour costs (ULC). If the numerator and denominator are divided by labour input (H) we get $\mathrm{ULC} = \frac{\mathrm{w}}{\pi}$ with $\mathrm{w} = \frac{Ws}{\mathrm{H}}$ as nominal wage per hour and $\pi = \frac{\mathrm{Yr}}{\mathrm{H}}$ as labour productivity. Thus unit labour costs depend on nominal wages per hour and productivity. If, for example, the nominal wage rate increases with the same rate as productivity, unit labour costs do not change.

The term $\frac{Q}{Yr}$ defines profit per output unit. With Kr as the real and P·Kr the nominal stock of capital and with q as the profit rate, profit is defined as: $Q = \mathrm{q} \cdot \mathrm{P} \cdot \mathrm{Kr}$. Profit per unit is $\frac{\mathrm{Q}}{\mathrm{Yr}} = \frac{q \cdot P \cdot Kr}{Yr}$.

For the definition of the price level or the macroeconomic price-setting equation, it follows:

$\mathrm{P} = \frac{\mathrm{w}}{\pi} + \frac{q \cdot P \cdot Kr}{Yr}$

If nominal unit-labour costs increase, the price level will increase in the first round. In the second round, this increase of prices will increase the nominal capital stock P·Kr as P has increased. Assumed is the economically needed valuation of the stock of capita at replacement costs. This leads overall to a proportional development of unit-labour costs and the price level.

It follow that changes in the price level are equal to changes of unit labour costs $\dot{P} = \left(\dot{w}/\pi\right)$or $\dot{P} = \dot{w} - \dot{\pi}$ whereas the dots symbolise changes. When a macroeconomic inflation target $\dot{P}t$ exists, the wage level should increases according to the following formula to realise the inflation target: $\dot{w} = \dot{P}t + \dot{\pi}t$. It is important that wages increase according to trend development of productivity $\dot{\pi}t$, as statistically, productivity is in the short-term influenced by the business cycle.

Appendix 2: Determination of the wage share (Ws/Y)

To explain the functional income distribution in the Keynesian paradigm, national accounting identities can again make the arguments clear. The wage sum in the economy is given by Ws = Y – Q. Using the explanations from Appendix 1 it follows that Ws = Y – q·P·Kr. Dividing both sides of the equation by Y and using the definition of the capital coefficient k $\left(\mathrm{k} = \frac{\mathrm{P{\cdot}Kr}}{\mathrm{Y}}\right)$ provides the follow definition of the wage share:

$$\frac{\mathrm{Ws}}{\mathrm{Y}} = 1 - \mathrm{q} \cdot \mathrm{k}$$

The wage share depends on the profit rate q and the capital coefficient. The latter reflects a certain technology which is used in the economy, including the relative importance of industries with high and low capital coefficients. But it also depends on the functional income distribution as the aggregates, like P·Kr, depend on the structure of prices and these on the profit rate (see Sraffa 1960).

The capital coefficient also can be written as $\mathrm{k} = \frac{\mathrm{P{\cdot}Kr}}{\mathrm{P{\cdot}Yr}} = \frac{\frac{\mathrm{Kr}}{\mathrm{H}}}{\frac{\mathrm{Yr}}{\mathrm{H}}} = \frac{\alpha}{\pi}$ with $\alpha = \frac{\mathrm{Kr}}{\mathrm{H}}$ as capital intensity of production and π as labour productivity. Then we get $\frac{\mathrm{Ws}}{\mathrm{Y}} = 1 - \mathrm{q} \cdot \frac{\alpha}{\pi}$. This shows that different technological processes affect the capital coefficient.

Appendix 3: Determination of the real wage level (w/P)

From the analysis above, we know that the wage share is given by $\frac{\mathrm{Ws}}{\mathrm{Y}} = 1 - \mathrm{q} \cdot \frac{\alpha}{\pi}$. Mathematical transformations of the left side of the equation give $\frac{Ws}{Y} = \frac{w \cdot H}{P \cdot Yr} = \frac{\frac{w}{P}}{\frac{Yr}{H}} = \frac{\frac{w}{P}}{\pi}$. Using the transformations it follows $\frac{\frac{w}{P}}{\pi} = 1 - q \cdot \frac{\alpha}{\pi}$, and finally $\frac{w}{P} = \pi - q \cdot \alpha$.

The real wage level $\frac{w}{P}$ depends on the labour productivity minus the profit rate multiplied by the labour intensity.

Appendix 4: Marx's argument of the falling profit rate

The profit rate $\mathrm{q} = \frac{Q}{Kr \cdot P} = \frac{\frac{Q}{Ws}}{\frac{Kr \cdot P}{Ws}}$. As $\frac{\mathrm{Q}}{\mathrm{Ws}}$ expresses the exploitation rate e and $\frac{Kr \cdot P}{Ws}$ the organic composition of capital OC. It follows $q = \frac{e}{OC}$. Marx argues that OC will increase in such a way that the increase of e cannot compensate this development. Even in Marx own system. this is not necessarily the case. Theoretically OC can also fall.

Appendix 5: The neoclassical marginal productivity theory of distribution

Let us assume a neoclassical real sphere without money. The latter is considered to be neutral. The profit function is $Q = P \cdot Yr(Kr,H) - w \cdot H - q \cdot P \cdot Kr$. The production function is given by $Yr = Yr(Kr,H)$ and total revenues by $P \cdot Yr(Kr,H)$. Wage costs are $w \cdot H$ and profit costs (usually called interest costs) $q \cdot P \cdot Kr$ with $P \cdot Kr$ as the nominal value of capital. With MPL as physical marginal product of labour (first derivative of the production function in respect to labour) and MPC as physical marginal product of capital (first derivative of the production function in respect to capital), a firm under perfect competition maximises profits when $MPL \cdot P = w$ and $MPC \cdot P = P \cdot q$. The profit maximising conditions can also be written as $MPL = w/P$ with w/P as real wage and $MPC = q$. The real income is equal to the real wage sum and real profit (interest) sum $Yr = H \cdot MPL + Kr \cdot MPC$ or $Yr = (w/P) \cdot H + q \cdot Kr$.

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Imprint

Editors:
Sigrid Betzelt Eckhard Hein Martina Metzger Jennifer Pedussel Wu
Martina Sproll Christina Teipen Achim Truger Markus Wissen
Reingard Zimmer

ISSN 1869-6406

Printed by
HWR Berlin

Berlin March 2018