



LUND UNIVERSITY

School of Economics and Management

The Contribution of Profits and Labour Costs to Inflation in Sweden in the Short and Long Run

A breakdown of the GDP deflator into profits and labour costs for 2019-2022
and 1994-2022

by

Celina Cataldi - celina.cataldi@gmail.com

Abstract- 2022 saw a significant increase in global inflation that eroded the purchasing power of many households. Contrastingly, many firms saw an increase in profitability against public dissatisfaction. Stemming from this conflicting development, more research has attempted to test a possible association between profits and inflation. However, much of this research has focused on the U.S. This thesis is focused on Sweden and uses a descriptive statistical method to measure inflation based on movements in the GDP deflator over time. Using Swedish national accounts data, the GDP deflator is broken down into unit profits and unit labour costs to examine their impact on inflationary pressures in the short run between 2019-2022, as well as the long run between 1994-2022. Comparisons are also made to the European Union and the Nordic Countries. The main findings confirm previous research and point to a strong contribution of unit profits to inflationary pressures from 2019-2022. However, in the long run, the impact of each unit cost on the outlook of inflation varies. The findings of this thesis are important by pointing to a revaluation of dominating explanations that usually ascribe labour costs (wages) as the main driver of inflation.

EOSK12

Bachelor's Thesis 15 ECTS

June 2023

Supervisor: Thor Berger

Examiner: Håkan Lobell

Word Count:12038

Acknowledgements

I would like to thank my supervisor Thor Berger for being a great support throughout the process of writing this thesis. Thanks for helping me with clearing out and organizing my thoughts and for being a great source of encouragement. Thank you to Vera, Alex, and Chayada, without you guys I would have let stress get to me a long time ago. I will forever be grateful for our friendship and for the strong spill over effects that your knowledge has had on me.

Table of Contents

1. Introduction.....	7
1.1 Research Problem.....	7
1.2 Aim of the Study and Research Questions.....	8
1.3 Relevance.....	9
1.4 Outline of Thesis.....	10
2. Background.....	10
2.1 Factor Shares and Inequality.....	10
3. Literature Review.....	12
3.1 Drivers of Inflation over Time.....	12
3.2 Current Inflation.....	14
3.2 Previous Research on the Functional Distribution of Inflationary Pressures.....	14
4. Theory.....	16
4.1 The Neoclassical School of Thought: Constant Factor Shares.....	16
4.2 Piketty: Variations in Factor Shares over Time.....	18
5. Methodology.....	20
5.1 National Account Price and Cost Framework.....	20
5.2 GDP Deflator vs CPI.....	22
5.3 Dataset.....	23
5.4 Limitations and Delimitations.....	25
6. Results.....	27
6.1 Factor Shares over Time.....	27
6.2 Increased Contribution of Unit Profits to Inflationary Pressures during 2019-2022	29
6.3 Inflation since 1994: the Long-run Trend.....	33
6.4 Comparison between Sweden and the Nordic Countries.....	36
7. Analysis and Discussion.....	38
7.1 Who Bears the Burden of Inflation? The Functional Distribution of Income and its Impact on the Outlook of Inflation.....	38
7.2 Inflation and Inequality and Fairness.....	40
7.3 The Functional Distribution of Income and Inflation Expectations.....	41
8. Conclusion.....	43
9. References.....	44

List of Figures

Figure 1: Movements in the Consumer Price Index versus the GDP deflator in Sweden 1994-2022.....	23
Figure 2: Factor Shares in Sweden between 1993-2022	27
Figure 3: Factor Shares in the European Union between 1995-2022.....	28
Figure 4: Distribution of Inflation in Sweden by Factor Shares 2019-Q4 to 2022-Q4...	29
Figure 5: Distribution of Inflation in the European Union by Factor Shares 2019-Q4 to 2022-Q4.....	30
Figure 6: Percentage Point Contribution of Unit Profits During Economic Downturns.	31
Figure 7: Percentage Point Contribution of Unit Labor Costs During Economic Downturns	31
Figure 8: Distribution of Annual Inflation in Sweden by Factor Shares 1994-2022	33
Figure 9: Distribution of Annual Inflation on a Quarterly Basis in Sweden by Factor Shares 1994-2022	33
Figure 10: Distribution of Annual Inflation on a Quarterly Basis in the European Union by Factor Shares 1996-2022.....	34
Figure 11: Comparison of the Distribution of Annual inflation on a Quarterly Basis in the Nordic Countries by Factor Shares 1996-2022	35

1. Introduction

1. 1 Research Problem

During 2022, majority of all OECD countries reached inflation levels unprecedented in four decades (OECD, 2022a), with far reaching impacts for individuals and economies on a global scale. According to the OECD (2022a) the cost-of-living crisis brought by higher inflation affected workers at the bottom of the distribution particularly, and the disproportionate effect of inflation on low-income households' points to their vulnerable position in times of rising costs (OECD, 2022a). This demonstrates how economic inequalities intensify when prices are rising, and as demonstrated in (Dousa, 2022; Carlén & Lind, 2023; Persson, 2022) making issues of economic justice a recurrent theme in the public debate.

Again, when prices and living costs increase and the burden of these costs affect households in disproportionate ways, naturally, a renewed focus on economic unfairness and rising demands for improved economic justice may arise. According to the ILO (2022) for the first time in 14 years they report a fall in global monthly wages during the first half of 2022 (p. 54), similarly, the real minimum wage for many OECD countries reported a fall due to inflationary pressures (OECD, 2022a). In Sweden, real wages dropped by five percentages during 2022 (Medlingsinstitutet, 2023). Importantly, when real wages are declining, low-income groups are more vulnerable since they spend a larger share of their income on basic needs (ILO, 2022, p. 55). Thus, this leaves some individuals more exposed to economic strains caused by inflation.

Although the labour force seems to have taken a negative hit from higher inflation (ILO, 2022), dissatisfaction has increased over firms in many industries collecting high profits amid a cost-of-living-crisis. Following, some scholars argue certain firms are taking advantage of rising costs to increase profits, referred to by Stiglitz and Regmi (2022) as a process when "companies are doing more than just passing on cost increases" (p. 39). For instance, data from the U.S demonstrates inflationary pressures since 2019 to deviate from its former historical trend by showing a strong increase in the impact of higher profits on rising prices

(Bivens, 2022). Alike, concerns of opportunistic firm behaviour in the EU area have also been addressed by staff from the European Central Bank (Panetta, 2022). Hence, although higher inflation and higher living costs translates to economic losses for many people, for those firms capable of raising prices above their own costs, volatile markets can be translated into economic wins in terms of higher markups.

Indeed, with more research confirming the contributing effect of higher profits to rising inflation (Bivens, 2022; Glover, Mustre-del-Rio & von Ende-Becker, 2022; Vinod, 2022; Konczal & Lusiani, 2022), and increased costs for the labour force in the form of falling real wages, these conflicting developments resonates with a traditional debate within political economy regarding the distribution of a society's output between labour and capital.

Undoubtedly, the division of national income between labour and capital has gained new relevance during recent decades (Atkinson, 2009), and can be attributed to an observed upsurge in economic inequality in the richer part of the world since the 1970s (Piketty, 2014, p. 25). In this thesis, the attempt is to take a closer look at this traditional debate and apply it to the context of inflation.

Arguably, the issue of distribution impacts the outlook of economic inequality, however, it also has important consequences for the gains and losses created by higher inflation between capital and labour. Indeed, the ability of capital and labour to influence and show resilience in response to increasing price levels depends on the economic power of each factor of production. Moreover, the position of capital and labour in the distribution of output also matter for our perception of fairness (Atkinson, 2009). In Sweden, this has become apparent during current inflationary times, where the distribution issue between capital and labour has gained renewed attention on the background of more people questioning if firms are raising prices more than motivated by increasing input costs.

1. 2 Aim of the Study and Research Questions

The main purpose of this thesis is to investigate to what extent profits and labour costs have contributed to the drastically increase in post-covid-19-inflation in Sweden. This will be done by taking a closer look at quarterly movements in the GDP deflator from 2019 to 2022 broken down by unit profits, unit labour costs and unit taxes. By decomposing inflation into three unit costs the aim is to clarify to what degree profits have contributed to inflationary

pressures compared to labour costs. This is relevant since there seems to have existed a debate on the “losers” and “winners” of inflation between workers and firms.

Again, the aim of this study is to investigate how much profits have contributed to domestic price pressures in Sweden compared to the cost of labour and taxes. However, to be able to interpret these results it is useful to compare them to previous historical trends. Therefore, this study will analyse the years of 2019-2022 in detail, as well as the development and decomposition of inflation from 1994 and onwards. Lastly, although this thesis focuses on inflation in Sweden primarily, comparisons between the European Union and the rest of the Nordic countries will also be included. The research questions of this study are as follows:

RQ 1: *To what extent have profits and labour costs contributed to post covid-19 inflationary pressures in Sweden?*

Sub-research question: *Are there any observed differences in the case of Sweden, compared to the European Union and the Nordic Countries?*

RQ 2: *What is the long-run trend in the contribution of unit labour costs and unit profits to inflationary pressures in Sweden from 1994-2022?*

Sub-research question: *Are there any observed differences in the long run trend for Sweden, compared to the European Union?*

1. 3 Relevance

Although more research has emerged that attempt to clarify the impact of rising profits on inflation (Glover, Mustre-del-Río & Ende-Becker; Konzcal & Lusiani, 2022; Vinod, 2022; Weber & Wesner, 2023), much of this research is focused on the U.S, and is still in its early phase (considering that as of writing, inflation levels are still high in many parts of the world). Moreover, the impact of profits on inflation proposes a “sorting chicken and eggs” issue where causality is difficult to declare (Vinod, 2022). For instance, to clarify to what extent profits are impacting inflation and vice versa has proven difficult (OECD, 2022b; Vinod, 2022). For this thesis, the aim is to complement a growing literature on the impact of profits versus labour costs to domestic inflation by taking a country-specific look at this development in Sweden using the same methodology as previous studies (ECB, 2013, ECB

2006; Macdonald, 2023; Richardsson, Saunder & Deniss, 2022). No former studies exist on this topic in Sweden, which increase the relevance of this thesis. The main purpose has been to examine if criticism towards the role of increasing profits and its possible impact on inflation correspond with the data available. This is important since inflation to a large degree is influenced by people's expectations, and therefore it is valuable to investigate the extent that perceptions of the distributional effects and drivers of inflation match with reality.

1. 4 Outline of Thesis

This thesis starts by taking a closer look at the relationship between factor shares and inequality and how movements in the capital share of national income has played a significant role in the outlook of inequality over time. The Literature Review that follows, will include a brief overview of the determinants of inflation over time, and the main characteristics of post covid-19 inflation. This part will also review previous research on the relationship between inflation and labour costs and profits. The theoretical part of this paper includes theories on the functional distribution of income, which will be applied later to analyse the found results, and to see to what degree the theoretical predictions made of the distribution between capital and labour corresponds with their contribution to inflation. The fifth part of this paper will critically examine its chosen methodology and dataset, as well as giving a brief overview of how the GDP deflator measures inflation. Part six and seven will present and discuss the findings of this study compared to previous research and theories. Lastly, the main findings will be summarized in the conclusion.

2. Background

2. 1 Factor Shares and Inequality

This thesis focuses on a breakdown of inflation into labour costs and profits in a similar way to the functional distribution of income. The functional distribution of income studies the division of national income into capital and labour shares. Indeed, the issue of distribution, or more precisely who is entitled to what in the output of production, has been a central concern

for political economy for centuries. In Ricardo's book *On the Principles of Political Economy and Taxation* (1821) the author states that "to determine the laws which regulate this distribution, is the principal problem in Political Economy" (p. 5). Indeed, the share of output allocated to capital and labour is arguably a reflection and determinant of the economic powers of each factor of production in relation to each other.

The functional distribution of income is important to discussion of economic inequality, since it impacts the personal distribution of income (Glyn, 2011). For instance, Piketty (2017, p. 64) argues inequalities for capital always to be greater than inequalities for labour. This is since the concentration of capital incomes and capital ownership is higher compared to the concentration of labour income. Moreover, since 1970, capital share seems to have increased in rich countries (Piketty & Zucerman, 2014). Arguably, this raise concerns on the outlook of inequality since capital shares which entail a more unequal distribution of income, is on the rise.

There are studies that point to an association between top incomes and capital shares. Bengtsson and Waldenström (2018) found a correlation between functional and personal income distributions for 16 countries during 1900-2010. They conclude that "the capital-labor split is an important determinant of inequality" (Bengtsson & Waldenström, 2018, p. 741). In a similar study focused on Sweden, Roine and Waldenström (2008) showed how for most of the 1900s, capital shares and top incomes have been strongly correlated, however, the correlation is significantly stronger during the first half of the 21st century. Adding to that, Milanovic (2015) argues that the impact of capital shares on interpersonal inequality depends on the social system of a society and the way that assets are distributed. Hence, according to Milanovic (2015) much empirical evidence points to an association between being "capital rich" and "overall income rich".

Arguably, the distribution of national income between capital and labour and the personal income distribution share close ties. Since the 1980s, the top income share in Sweden has drastically increased, although having started off from relatively low levels compared to other countries (Roine, 2014, p. 34). Moreover, over time, capital income has been a crucial driver for movements in top incomes in Sweden. During much of the 1900s, falling capital incomes amongst the top were a strong contributor to drops in overall top incomes. However, since the 1980s top incomes have almost doubled again (Roine, 2014, p. 35). Although Sweden is

known for being an equal country, income inequality is on the rise, and between 1985 and 2015 Sweden came first compared to all OECD countries in terms of fastest growing income inequality (OECD, 2015). Based on these developments, it is no surprise that the functional distribution of income continues to share strong connections to discussions of equality and fairness as argued by Glyn (2011).

3. Literature Review

3.1 Drivers of Inflation over Time

Quantity Theory of Money

The most influential theory explaining the long-run impact of money on the economy, is the Quantity Theory of Money (Mankiw & Taylor, 2016, p. 106). In essence, the Quantity Theory of Money describes how an economy's nominal output is determined by its money supply. Although an economy's real output is determined by its productive capacities (e.g. availability of resources, labour, and knowledge), its nominal output is determined by the money supply set by the Central Bank. This means that changes in the money supply determines changes in the price level. Since nominal output is determined by the supply of money, and real output is determined by the productive capacities of an economy, an increase in the money supply will cause nominal output to increase. When nominal output increases, and real output remains the same (assuming no change in an economy's productive capacities) this will cause the price level to increase. Hence, according to the Quantity Theory of Money, the rate of inflation is determined by the money supply, for which the Central Bank oversees (Mankiw & Taylor, 2016, p. 106).

Other Explanations

Generally, inflation describes an increase in the price level over a period (Mankiw & Taylor, 2020, p. 192). However, prices can rise due to different reasons. Demand-pull inflation is inflation driven on the demand side and stems from high aggregate demand (Mankiw and Taylor, 2016, p. 421), and arises when total demand for goods and services (aggregate demand) exceeds the supply of goods and services (aggregate supply). An increase in

aggregate demand can be caused by higher spendings from consumers, firms, government, or due to an increase in net exports. When aggregate demand exceeds aggregate supply, wages will increase as firms seek to attract more labour. In turn, higher labour costs might get passed on to consumers in the form of higher selling prices. Furthermore, higher wages will increase the purchasing power of households and cause consumer spending to increase (Reserve Bank of Australia, 2022).

Contrastingly, cost-push inflation happens when higher input costs of firms are passed on as higher selling prices (Mankiw & Taylor, 2020, p. 317). This is due to a fall in the total supply of goods and services produced in an economy (aggregate supply). A fall in aggregate supply is often driven by higher costs in production (Reserve Bank of Australia, 2022). If aggregate supply falls and aggregate demand is unchanged, aggregate demand will exceed aggregate supply and this will cause the price level to increase. According to the Reserve Bank of Australia (2022) some common reasons for higher production costs include increasing prices for oil or raw materials, as well as supply disruptions in specific industries. Altogether, events like these tend to push up the price for other goods and services.

Lastly, inflation can stem from expectations. Arguably, the belief amongst firms and households on future inflation can tend to cause a self-fulfilling prophecy, making expectations impact the reality of an economy's price level. Expectations of higher costs in the future might cause a firm to increase its selling price the same way that a worker will demand a higher wage (Reserve Bank of Australia, 2022). Thus, the ability of a central bank to impact inflation expectations through macroeconomic policy is determined by the credibility of the bank (Baumann, 2021). If the credibility is high, inflation expectations in the long term are anchored, and this allows for the central bank to effectively use monetary policy to impact wage and price setting processes (Baumann, 2021). Again, when inflation is anchored to the target, inflationary shocks in the short run, such as a supply disturbance for instance, will draw inflation back to the target in the long run (Reserve Bank of Australia, 2022). Indeed, if people expect the central bank to be credible, their expectations will allow for the central bank to effectively tackle inflation.

3. 2 Current Inflation

In short, the biggest drivers of recent levels of inflation in the euro area have been food and energy related price pressures (Arce, Koester & Nickel, 2023). In this regard Sweden is no exception (National Institute of Economic Research, 2022). Even though energy makes up a relatively small portion of the Swedish consumption basket, its contribution to inflation has been large in comparison (Statistics Sweden, 2022a). Moreover, energy prices have proved to be volatile and have a large pass-through to other prices in the rest of the economy (Statistics Sweden, 2022b). Just as energy prices, food prices have also increased significantly, and reached levels during 2022 unseen since the 1980s (Statistics Sweden, 2022a). Arguably, food and energy has been one of the main drivers of inflationary pressures, both in the euro area and in Sweden.

According to Sweden's National Institute of Economic Research (2022) a combination of post-pandemic demand increases, and global supply disturbances have been important factors to rising energy and food prices. However, for both Sweden and the euro area much attention have been given to the impact of Russia's invasion of Ukraine for food and energy prices (Adolfson et al., 2023; Arce, Koester & Nickel, 2023; Bodnár & Sculer, 2023; National Institute of Economic Research, 2022; Swedish National Bank, 2023). The war gave rise to food supply disturbances related to production of crops and fertilizers, as well as damages in transportation capacities. Importantly, due to a high energy intensity of agricultural production and food processing, these industries were exposed to rising energy costs, and shows the interconnection of many factors in the outlook of inflation. In sum, during 2021 and 2022 global inflation reached levels not seen in decades, and according to the Swedish National Bank (2023) price increases were broad and caused by an inability of supply to keep up with post covid-19 demand. Moreover, Russia's invasion of Ukraine intensified this process by destabilizing energy supplies for Europe that had strong pass-through effects on the rest of the economy.

3. 3 Previous Research on the Functional Distribution of Inflationary Pressures

This section will evaluate previous research on the distribution of factor shares and their contribution to inflationary pressures, as well as research on the relationship between profits and inflation. Most of these studies focuses on post covid-19 inflation.

Pre covid-19 inflation in the euro area show unit profits contributing to one third of increases in the GDP deflator between 1999-2013, whilst unit labour cost amounted to 50% of all domestic price pressures in the region, and the residual belonging to unit taxes (ECB, 2013). Furthermore, accounting for the global financial crisis in 2008, unit profits recovered quicker than unit labour costs after having experienced a strong drop initially. Overall, the ECB (2013) refers to the role of unit profits as a buffer to increasing unit labor costs during the financial crisis and as a stabilizer to the price level. Contrastingly, during recent inflationary pressures, growing attention has been given to the increased role of unit profits to domestic inflation within the Euro area (Panetta, 2022; Schnabel, 2022).

On the background of increasing global inflation, more and more research has made use of the same methodology as the ECB (2013, 2006) to examine domestic price pressures of different countries. For Canada, Macdonald (2023) were able to use data up until September of 2022 to show how increasing inflation and corporate profits mainly have been driven by higher international energy prices benefitting Canadian businesses operating in those related sectors. Moreover, Macdonald (2023) demonstrates that 41% of the money spent between Q3-2020 to Q3-2022 has been allocated to profits, compared to 35% to labour compensation. Overall, the Canadian experience points to a dominating role of unit profits in pushing up business inflation (as measured by the GDP deflator) during 2021 and half of 2022 (Macdonald, 2023).

In a similar study for Australia, Richardsson, Saunder, and Deniss (2022) showed a negative growth in real wages beginning in the first quarter of 2021 and that lasted up until Q1-2022 (their data did not reach longer). Furthermore, their findings point to a dominating role of unit profits in the contribution to domestic inflation since 2020 (Richardsson, Saunder, Deniss, 2022). Actually, “unit labor costs played almost no role in inflation (as measured by the GDP deflator) over the period 2013-2021” (p. 11). Compared to the analysis of Richardsson, Saunder and Deniss (2022), ECB (2013), Panetta (2022), and Schnabel (2022) the main strength of Macdonalds’ (2023) study is a breakdown of the GDP deflator limited to the business sector. This allows for a better analysis of the role of profits in inflation, since the general GDP deflator also includes non-profit making institutions.

Other studies have looked beyond the method used by Panetta (2022), Schnabel (2022), Macdonald (2023), and Richardsson, Saunder and Deniss (2022) to investigate the relationship between profits and increasing inflation. Much of this research is limited to the U.S. According to econometric data presented by Vinod (2022), since the covid-19 pandemic, a causal relationship has existed between higher profits and higher prices. Similarly, Bivens (2022) show how unit profits contributed to 53,9%, of unit price increases in the nonfinancial corporate sector in the U.S between Q2-2020 to Q4-2021, compared to unit labour costs that only amounted to 7,9% of these price changes. Further, Glover, Mustre-del-Río and von Ende-Becker (2022) found evidence on the contribution of higher markups to inflation in 2021, caused by firms raising prices based on expectations of future price increases. However, according to Glover, Mustre-del-Río and von Ende-Becker (2022), firms do not raise prices based on greed to boost profits, but to “smooth price increases they expect in the future” (p. 8). Indeed, different explanations exist on the role of profits to current inflationary pressures, however, as pointed out by the OECD (2022) it is still difficult to distinguish between price increases that are genuinely driven by changes in costs, and those that are driven by higher profits.

4. Theory

The theoretical part of this paper evaluates different frameworks on the long and short run trends in factor shares. This requires taking a closer look at the main theoretical foundation of this paper, namely the neoclassical school of thought and their predictions of constant factor shares. Following this, subsequent paragraphs will include the work by Thomas Piketty (2014) in testing the neoclassical theory through an examination of long reaching historical income data from different countries and time periods across the world.

4. 1 The Neoclassical School of Thought: Constant Factor Shares

The neoclassical theory predicts factor shares to be constant, meaning that the distribution of national income between capital and labour is assumed to be stable over time. This assumption is underpinned by an idea of factors in production earning their marginal products (Biddle, 2020, p. 17). According to Biddle (2020, p. 15; 300) neoclassical theory distinguished itself by having a stronger focus on the use of mathematical frameworks and

statistical data underpinning its theories and assumptions. Hence, an important contribution to the neoclassical theory of factor shares is the Cobb-Douglas production function.

Generally, Carlén (2018) describes production functions to illustrate the maximal output obtained using a given combination of two factors of input: labour and capital. The combination of inputs is given by the price of labour (wage) and the availability of capital (capital stock), as well as the productivity of labour and the rent of capital. Altogether, the combination of inputs in the production process will reflect the producer's will to maximize profits and will therefore be chosen so that the marginal cost of inputs never exceeds its marginal contributions (Carlén, 2018).

Cobb and Douglas (1928) were able to illustrate the prediction of a constant trend in the share of capital and labour in national income through a production function. Based on available U.S manufacturing data between 1899-1922, they compiled indexes that showed a regular pattern in the growth of capital and labour in manufacturing over time, and more importantly, that this pattern in production corresponded with the patterns of distribution in a way so that “the process of distribution follow in large measure the process of production if sufficient time is allowed” (Cobb & Douglas, 1928). Further, the relationship between capital and labour in production was argued to best be described by the production function:

$$F(K,L) = A((K^a))(L^{1-a})$$

$F(K,L)$ = output produced by two available input factors: capital (K) and labour (L)

a = determines the share of national income distributed to capital and labour respectively

A = measures the technological productivity available in an economy

In Cobb and Douglas's original paper (1928) a was estimated to 3/4, and thereby defined a constant relationship between labour and capital with 3/4 of production ascribed to labour and 1/4 to capital (p. 156). Besides showing a constant relationship between factor shares, two important assumptions underpin the Cobb-Douglas Production Function: constant returns to scale in production, and factors involved in production earning their marginal products (Mankiw & Taylor, 2020). Hence, firstly, the Cobb-Douglas Production Function describes a production process where the rate of output is determined by the rate of inputs, meaning that

output changes in proportion to changes in inputs of labour and capital. Therefore, holding everything else constant, an increase in one factor of input (e.g adding one extra hour of labor work) into production will give rise to a proportionate increase in output.

Secondly, the Cobb-Douglas production function assumes factors of production earning their marginal products. According to Biddle (2020, p. 17) this stem from the idea that on a perfectly competitive market with producers driven to maximize profits, the equilibrium price of a factor is determined by the preference of the people on the market, and the available technology used to produce goods and services from each factor. The price of a factor is therefore equal to its marginal product, meaning that the price of a factor is set on a market where prices are determined by the technology available to use in production, and the demand for the product being sold (Biddle, 2020, p. 17). Naturally, a profit maximizing agent will continue to increase inputs of capital and labour up until the point where marginal cost equals marginal productivity, since this is where production is optimal (Carlén, 2018). In conclusion, the Cobb-Douglas production predicts a constant pattern of factor shares, based on the assumption of factors earning their marginal products and constant returns to scale in production.

4. 2 Piketty: Variations in Factor Shares over Time

Unlike the predictions of neoclassical economics, Piketty (2014) argues the long run trend in factor shares to follow a pattern of variation rather than constancy. Instead, Piketty (2014, p. 236) argues the historical reality of the world to be more complex than the relationship described in the Cobb-Douglas production function. For instance, based on long run data from France and the U.K, Piketty (2014) demonstrates how fluctuations in factor shares are part of a long run trend since the 1700s. More importantly, according to Piketty (2014, p. 239) recent decades (1970-2010) have seen a gradual increase in the share of national income ascribed to capital in richer countries, with a possibility of this trend spilling over to other countries in the future.

Two central arguments are made by Piketty in his book *Capital in the Twenty-First Century* (2014) and those regard the development and impact of the capital share and the capital stock on different economies over time. These are referred to as the two fundamental laws of

capitalism (Piketty, 2014), that in many ways relate to each other. According to the first law of capitalism, the capital share of national income is defined as:

$$\alpha = r \times \beta$$

α = capital share of national income

r = rate of return on capital

β = capital stock, presented as a capital/income ratio

It is crucial to understand that there is a difference between the capital share of national income and the capital stock. The capital stock “corresponds to the total wealth owned at a given point in time” (Piketty, 2014, p. 50), and is presented in the most useful way as a country’s capital/income ratio (Piketty, 2014). Hence, the capital stock can be thought of as measuring a country’s quantity of capital in relation to its annual flow of income.

Contrastingly, the capital share of national income depends on the stock of capital available and the rate of return on capital (as described in the function).

The second fundamental law of capitalism describes how the capital stock in the long run relates to the savings rate and the growth rate of national income in a way so that:

$$\beta = s/g$$

s = savings as a percentage of total national income

g = growth rate (dependent on demographic growth and productivity growth)

Hence, according to this function, a country that saves a big share of its national income and simultaneously grows slowly will see a big increase in their capital stock. Thus, this will impact the outlook of the capital/income ratio and the distribution of wealth. This is since in a society where the growth rate is low, which according to Piketty (2014, p.181) is the case for 21st century societies, “wealth accumulated in the past will inevitably acquire disproportionate importance” (Piketty, 2017, p. 166).

Moving on from these two laws, it is important to understand their impact on the outlook of the capital share over time. Based on far reaching data from France and the U.K the capital

share of national income (α) appears to move in a similar U-shape pattern as the capital stock (β) over time, Piketty describes this as (2014, p.217):

More precisely: we find that capital's share of income was on the order of 35-40 percent in both Britain and France in the late eighteenth century and throughout the nineteenth, before falling to 20-25 percent in the middle of the twentieth century, and then rising again to 25-30 percent in the late twentieth and early twenty-first centuries.

Piketty's (2014) findings prove how factor shares indeed have varied over time, and that in the long run, an increase in the capital share has led to an increase in the capital stock and vice versa (p. 239). Recalling that the capital share depends on both the capital stock and the return rate of capital, this means that when the capital stock has been small (for instance after the destructions brought by the second World War) the rate of return of capital has been high (Piketty, 2014, p. 234). This is since the marginal rate of return on capital diminishes as the capital stock increases, Piketty describes this as "too much capital kills the return on capital" (2014, p. 215). Hence, the capital share is determined by movements in the capital stock and the rate of return on capital, in proportion to each other. If the rate of return on capital diminishes stronger in proportion to an increase in the capital stock, the capital share will fall. The opposite is true if the rate of return on capital diminishes slower in proportion to a growing capital stock, this will cause the capital share to grow larger.

In sum, based on Piketty's long run data there are no signs for the capital share or the capital stock to be stable over time. Lastly, according to Piketty (2014, p. 36) the 21st century is likely to see increasing levels of inequality, due to declining growth rates (both demographic and economic) that are matched with an exceeding rate of return on capital, described as $r > g$. In accordance with both the first and second fundamental law of capitalism, when r exceeds g , "inherited wealth grows faster than output and income" (Piketty, 2014, p. 26) which causes wealth inequality to increase.

5. Methodology

This section will present the choice of method used to answer the research questions of this thesis. Furthermore, this section will critically present the limitations of this paper, and the delimitations that have been necessary to take on for the scope of the thesis not to be too wide

and for the research to be conducted successfully within the assigned time frame. Lastly, this segment will discuss and describe the process of data collection and the choice of dataset.

5. 1 The National Account Price and Cost Framework

This thesis primarily focuses on an examination of inflation in Sweden, and secondarily on comparisons made to the European Union and other Nordic countries to enrich the analysis. It replicates the methodology used by the European Central Bank (2006; 2013; Panetta, 2023; Schnabel, 2022), referred to as “the national accounts price and cost framework”, and is used by other researchers examining the relationship between inflation and corporate profits (Richardson, Saunders & Denniss, 2022; Macdonald, 2023). These studies measure inflation through movements in domestic price pressures captured in the GDP deflator over time. This approach allows one to decompose the GDP deflator into three different unit costs; *unit labour costs*, *unit profits* and *unit taxes*. Essentially, this allows one to analyse the extent that labour costs, profits and taxes are contributing to the growth in the GDP deflator.

Indeed, the national accounts price and cost framework relies on the possibility of national accounts data to be decomposed in multiple ways (European Central Bank, 2006). For this study, the Gross Domestic Product (GDP) is decomposed using the income approach. The income approach focuses on the distribution of GDP “among different participants in the production process” (Eurostat, 2016). According to the income approach, GDP can be decomposed into:

$$\mathbf{GDP = compensation\ of\ employees + gross\ operating\ surplus\ [including\ mixed\ income] + net\ taxes\ [taxes\ on\ production\ and\ import\ less\ subsidies\ on\ production]}$$

Hence, the income approach allows for GDP to be divided into three different components. Following, these serve as the basis of a later breakdown of the GDP-deflator into *unit labour costs*, *unit profits* and *unit taxes* using this formula:

$$\mathbf{Unit\ costs = (cost\ of\ X\ in\ year\ t/Real\ GDP\ year\ t)*100}$$

E.g if x=labour costs, the equation will take the form of:

$$\text{unit labor cost} = (\text{cost of labour year } t / \text{Real GDP year } t) * 100$$

Hence, movements in the GDP deflator are ascribed to each unit cost. This is since the GDP deflator is an index measuring the price of GDP per unit of output (European Central Bank, 2013), and how these prices have changed in relation to the base year. In short, the national account and price framework relies on the GDP deflator to capture changes in the “price level” of the domestic economy over time and utilizes the income approach to GDP to explain how these changes in costs are distributed between labour, profits and taxes.

5. 2 GDP Deflator vs CPI

In this paper, inflation is measured as annual percentage point changes in the GDP deflator. The GDP deflator measures the price of goods and services produced in an economy and is an index calculated according to this equation:

$$\text{GDP Deflator} = (\text{Nominal GDP} / \text{Real GDP}) * 100 \quad (\text{Mankiw \& Taylor, 2020, p. 87})$$

The GDP deflator describes movements in Nominal and Real GDP in relation to each other, and can only be constant when Nominal GDP moves in exact proportion to Real GDP (Mankiw & Taylor, 2020, p.78). Indeed, the GDP deflator measures inflation differently compared to the Consumer Price Index that derives an economy’s price level based on a fixed consumption basket. Instead, the GDP deflator measures inflation as price pressures in the domestic economy (ECB, 2006).

Obviously, this means utilizing the GDP deflator comes with certain trade-offs. Mankiw and Taylor (2023, p. 98) explains the main difference between each inflation measurement to be the fact that CPI measures the prices of goods and services *consumed* in an economy, whilst the GDP deflator measures the price of goods and services *produced* domestically in an economy. Adding to that, Macdonald (2023) explains this to allow for changes in export prices to be captured by the GDP deflator. Hence, price movements of imported goods and services are reflected in CPI, whilst price movements of exported goods and services are reflected in the GDP deflator.

Furthermore, since the GDP deflator reflects the price of domestic production over time, the group of goods that make up the GDP deflator changes automatically over time as the economy and consumer behaviour changes unlike CPI which is based on a fixed consumption basket (Mankiw & Taylor, 2020, p. 98). Indeed, this one of the strengths of using the GDP deflator over CPI. Lastly, although the GDP deflator and CPI tend to move in the same direction (Mankiw, 2020, p. 98; Macdonald, 2023; Richardson, Saunder, Deniss, 2022) it is important to understand that they measure inflation slightly differently. However, for this paper, the main advantage of the GDP deflator is explained well by Macdonals (2023) to be its ability to “follow price changes across the entire economy and not just the change in retail prices for consumers” (p. 6) and its ability to be broken down into separate unit costs (labor, profit, taxes) as a “measure of inflationary price changes” (p. 6).

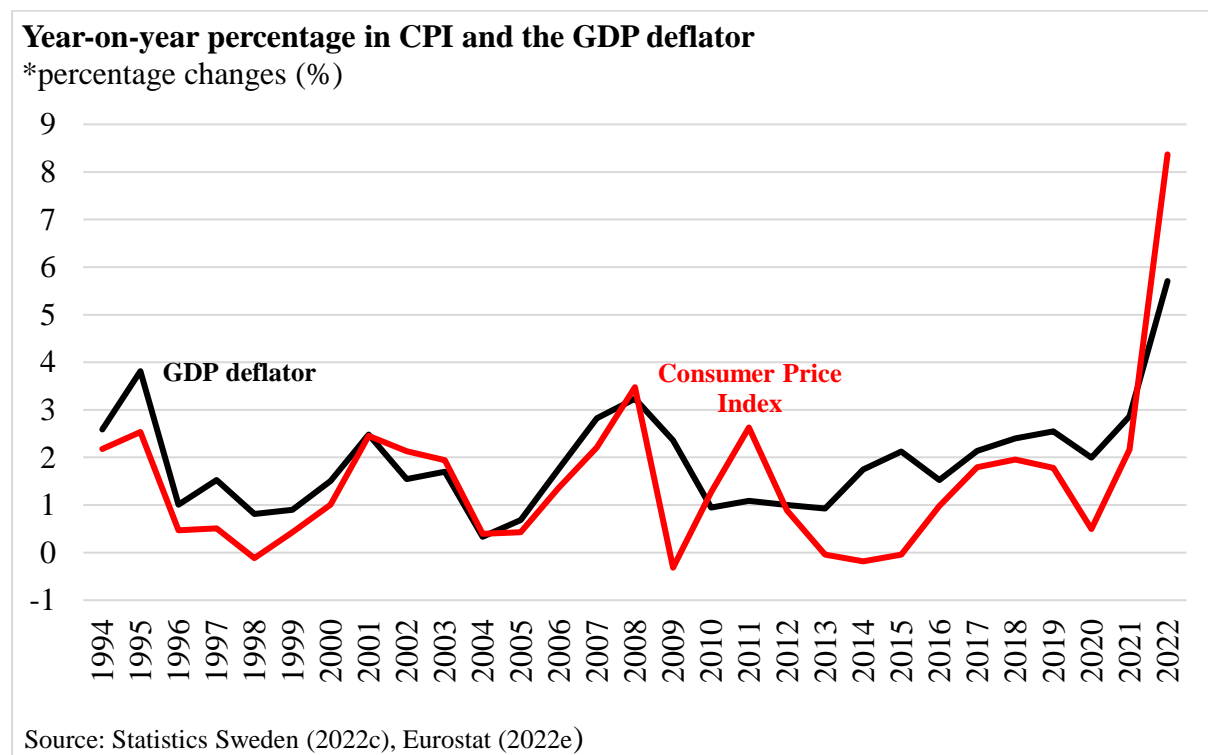


Figure 1: Movements in the Consumer Price Index versus the GDP deflator in Sweden 1994-2022

5. 3 Dataset

This thesis relies on national accounts data from Eurostat that uses the European System of Accounts (ESA) in compiling and categorizing its data. Thus, the ESA serves as the general accounting system for the European Union (EU) and is compatible with other international

accounting frameworks. The ESA 2010 framework uses two types of classification strategies to subdivide the economy. The first one categorizes the economy based on institutional units and sectors. Correspondingly, five sectors in total form the domestic economy and they are labelled: non-financial corporations, financial corporations, general government, and households and non-profit institutions serving households. Additionally, the second strategy divides the total economy into different categories depending on the form of production activity of each institutional unit. These categories are referred to as Local KAUS and are combined to form different industries (Eurostat, 2013). In sum, the ESA 2010 categorizes the domestic economy into industries and sectors that can be subdivided into smaller entities depending on the analytical purpose.

The national accounts data from Eurostat includes data for EU-countries and countries of the Eurozone, as well as data for the entire union combined. As previously mentioned, this study uses the income approach to GDP where GDP is broken down into employee compensation, operating surplus, and taxes less subsidies on production for the whole economy. Employee compensation is the total of wages and salaries and employers' social contributions, whilst operating surplus and mixed income includes the gross surplus of the total economy as well as mixed incomes from unincorporated enterprises and those self-employed (Eurostat, 2023c).

For this study, data on GDP has been derived on a quarterly level using the `t_namq_10gdp` data set and on an annual level using the `t_nama10gdp` data set. Both data sets are labelled as "GDP and main components (output, expenditure and income)" which includes GDP broken down into separate costs (employee compensation, operating surplus, and net taxes). The use of annual data has had the purpose of exploring general trends in inflation over time by taking on a time scope as far back as 1995. Further, quarterly data has been used to allow for a shorter but more detailed examination of inflationary trends during 2019-2022, and for the subsequent quarters following the financial crisis during 2008 and the covid19-pandemic. For instance, although annual data is useful in explaining the overall inflationary trend, it is of special interest to be able to analyse the years of extraordinary high inflation (2022) and the years following a recession and economic downturns (2009, 2020). All quarterly data is seasonally adjusted to correct for effects on GDP brought by seasonal fluctuations (Eurostat, 2023c) and calendar adjusted to correct for effects brought by events such as holidays and changing numbers of weekdays (Eurostat, 2023a). This improves the reliability of the data

and enables for a higher level of accuracy when analysing GDP over time on a quarterly basis.

Regarding the geographical scope of this thesis, data on GDP and its main components and the GDP deflator has been collected for Sweden, Norway, Finland, Denmark, and the European Union. The intention of including other countries other than Sweden has been to broaden the analysis by including the Nordic countries countries that are geographically and economically close to Sweden.

5. 4 Limitations and Delimitations

This section focuses on the limitations related to this thesis, and the delimitations that had to be carried out for the scope not to be too broad. The limitations can be divided into three categories, and concerns: the construction and choice of variables, the generalization of the total economy, and the time frame.

The construction and choice of variables from Eurostat have limitations that are related to the way that each variable is defined, and which costs are included and excluded respectively. As a starting point, the income approach to GDP is only one of three ways to measure GDP (ESA, 2010) and relies on the principle of an economy's total income = total expenditure on goods and services (Mankiw & Taylor, 2020, p. 78). Obviously, this limits the measurement of an economy by not including work performed in the home and volunteer work. Moreover, it also excludes the distribution of income, which makes analysing the “burden” of inflationary pressures more difficult as this depends on the individual level of income within a population. Again, the variable *unit labour costs* is derived from the income approach to GDP, which estimates the unit labour cost of the entire population employed, and does not describe what the distribution of employee compensation looks like for specific individuals.

Another limitation lies in the *gross operating surplus* variable that also includes the costs of mixed income. Gross operating surplus does not include consumption of fixed capital, which otherwise describes an enterprise's decline in fixed assets (Eurostat, 2023a), and therefore excludes the share of operating surplus that is allocated to compensate for the cost of depreciation. Moreover, by also including mixed income, the *operating surplus* variable raises issues of where to draw the line between what is considered a self-employed person's

“employee compensation” and “profit”. Indeed, the line between the two categories can be ambiguous.

The second limitation is related to the choice of including variables that reflect GDP of the entire economy. Again, according to ESA 2010, GDP is made up by institutional units that include non-financial corporations, financial corporations, general government, and households and non-profit institutions serving households. Hence, the inclusion of institutional units belonging to the governmental and non-profit category might not be of optimal relevance when examining the extent that unit profits are driving inflation since these are not profit-making institutions. In this regard, studies such as Macdonald (2023) with GDP delimited to the business sector (excluding financial corporations) likely would answer the research question more accurately by focusing on profitable companies exclusively, especially since the GDP deflator for the business sector in that study proved to be higher than the general GDP deflator. However, due to closeness in time, data on the profitability of Swedish companies that otherwise can be found in datasets like *Företagens ekonomi* (SCB) are only covering 2021 as its latest year. Using this dataset would not be optimal, since it would exclude the year of 2022 with the highest reported rate of inflation in Sweden during recent years. Instead, considering the limitations of the dataset from Eurostat it was easier to make comparisons between countries by using a standardized and comprehensive dataset.

Lastly, this thesis also has limitations concerning its chosen timeframe. The national accounts data is a time series data from Eurostat that covers 1975Q1-2022Q4. However, this is not the case for all countries due to great gaps in the data. This is why a common starting year of 1995 was chosen to account for differences in the statistical coverage between countries. Indeed, it would be valuable to base the analysis on a longer time frame since this would make the results more reliable. Nonetheless, the main strength of this study is still its closeness in time and its ability to cover a time frame including three economic recessions (1993/1994, 2008, 2019/2020). However, another additional limitation that is related to the chosen time frame is the exceptionality of events occurring during 2019-2022. Again, the last three years have witnessed remarkable events that include a global pandemic, and global inflation levels unseen in four decades (OECD, 2022). Arguably, this makes comparisons over time more difficult due the occurrence of these unnormal events and their economic impacts.

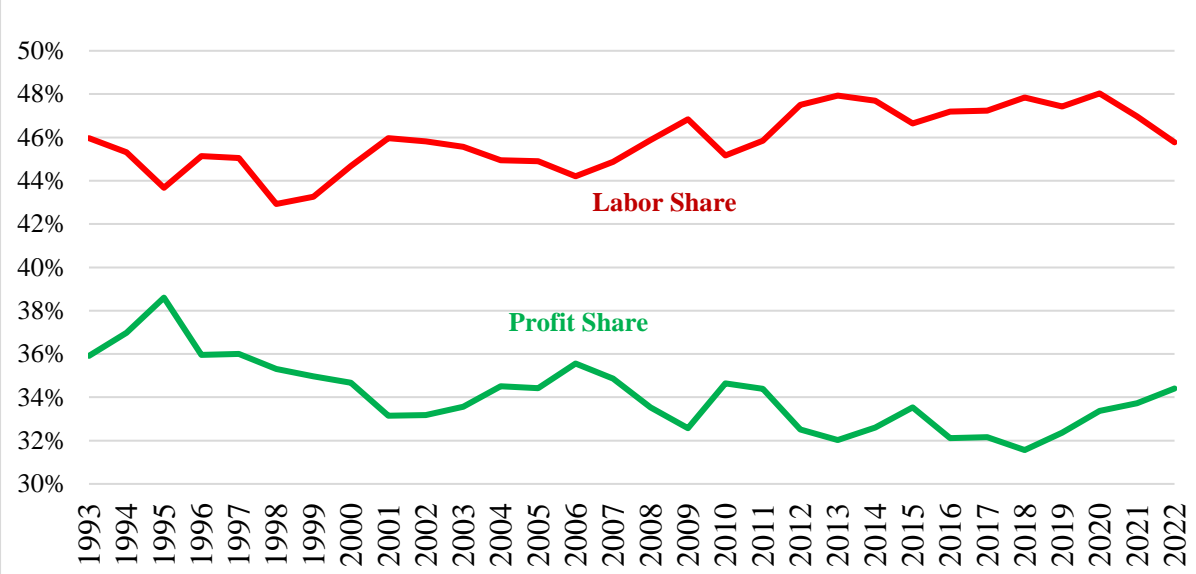
6. Results

6.1 Factor Shares over Time

Figure 2 and 3 displays the evolution of factor shares in Sweden and the European Union over a 29-year and 27-year period. As observed in both figures, factor shares of the European Union and Sweden do not show a constant pattern over an almost three-decade period. For Sweden, the profit share has fluctuated between a 31,6 % to 38,6% interval (Figure 2), whilst for the European Union the profit share has fluctuated between a 40,7% to 42,6% interval and therefore portrays a more stable pattern (Figure 3). Additionally, over time, profits make up a bigger part of national income in the European Union compared to Sweden. This is also true for the labour share (Figure 2, Figure 3). Some years are especially interesting to look at regarding the aim of this thesis, these include 1993/1994 (for Sweden), 2008, and 2019/2020. These are all years of recessions and economic downturns. In Figure 3, the year leading up to and following 1993/1994, 2008 and 2019/2020 seems to follow a pattern of a falling and later rising profit share. The opposite seems to hold true for the labour share (Figure 3). This is especially true for the year surrounding 2008 where the profit share and the labour share seems to move in opposite directions. Interestingly, since 2019/2020 the labour share has been on a downward trend, and the profit share has been moving in the opposite direction (Figure 2). However, the profit share started rising already in 2018 (Figure 2). In Figure 3, the preceding and following years of 2008 show a pattern of a rising and later falling profit share. Between 2007 and 2009, the profit share showed a clear drop, and the labour share moved in the opposite direction. However, after 2009 the profit share started rising slightly, and the labour moved in the opposite direction. Similarly, since 2019/2020 the profit share has been on an upward path, and the labour share has fallen. Compared to previous years these patterns are stronger (Figure 3). Overall, no clear trend appears in the variation of factor shares for neither Sweden nor the European Union, although fluctuations are smaller for the European Union.

Factor Shares of Swedish GDP 1993-2022

*share of employee compensation, and operating surplus and mixed income of total GDP

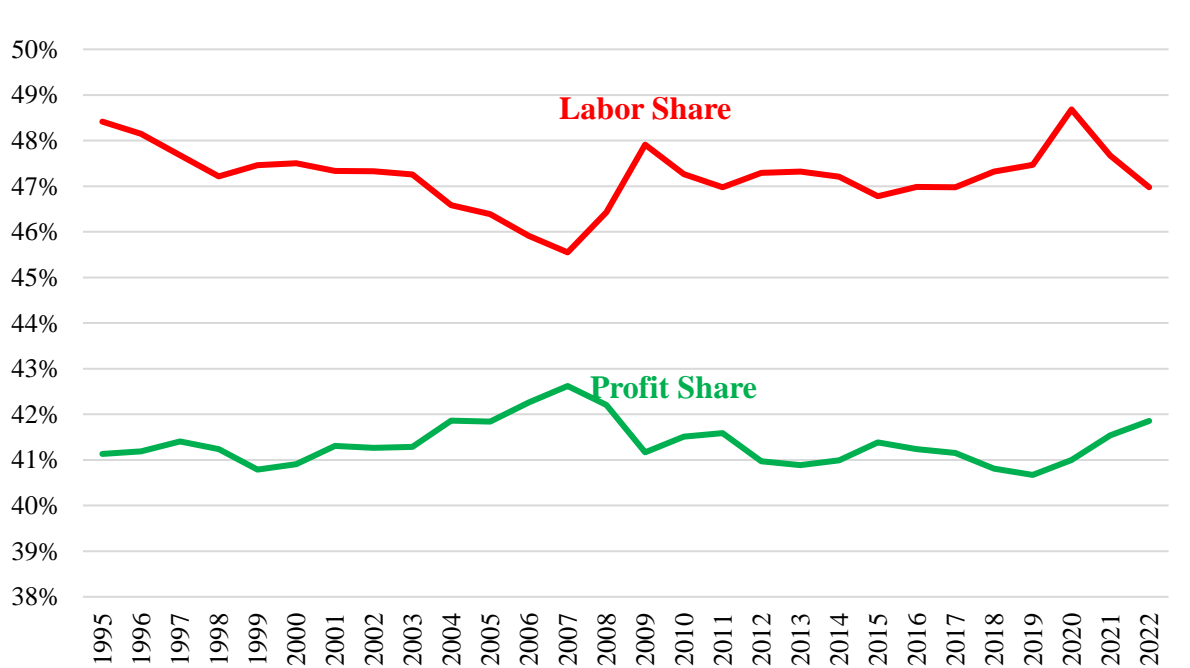


Source: Eurostat (2022e)

Figure 2: Factor Shares in Sweden between 1993-2022

European Union: Factor Shares of GDP 1995-2022

*share of employee compensation, and operating surplus and mixed income of total GDP



Source: Eurostat (2022e)

Figure 3: Factor Shares in the European Union between 1995-2022

6. 2 Increased contribution of unit profits to inflationary pressures during 2019-2022

In Figure 4 and 5, inflation is broken down into unit labour costs, unit profits, and net taxes since the outbreak of the covid-19 pandemic. Firstly, inflation levels between Sweden and the European Union are similar, with inflation increasing at the same time in the first quarter in 2022 (Figure 4) and (Figure 5). Secondly, a general pattern in both figures is an increase in the contribution of unit profits to movements in the deflator during 2022. This is obvious for both figures. Additionally, in Figure 6 and Figure 7 inflationary pressures are examined in relation to previous economic downturns and crises in Sweden. Notably, compared to former financial crises during 1993/1994 and 2008, the post covid19-pandemic economic downturn showed a more resilient contribution of unit profits to inflation (Figure 6). On the other hand, the contribution of unit labour costs to inflationary price pressures were comparatively high in the beginning of 2020, but later dropped substantially and regained its contribution power in the end of 2022 (Figure 7).

Indeed, starting in the third quarter of 2021, unit profits' contribution to inflation has steadily grown larger for the European Union (Figure 5) and the same is true for Sweden up until the third quarter of 2022 (Figure 4). Hence, during 2022, when inflation reached its highest, unit profits made up a big part of inflationary price pressures in both Sweden and the European Union. Before 2022, the contribution of unit labour costs and unit profits was more evenly distributed for Sweden (Figure 4), and the same can be said for the European Union except for the second quarter of 2021 where unit labour costs show a negative percentage point change (Figure 5). One difference between both figures is that unit profits are more resilient in the European Union compared to Sweden. By the end of 2022 (Q4) unit profits contribution to inflation had shrunk in Sweden in proportion to other unit costs, whilst in the European Union they still made up over 50% of the contribution to inflation.

Sweden: Decomposition of the GDP deflator at market prices by unit labor costs, unit profits and net taxes 2019-2022

*Percentage point changes from previous year's quarter;
percentage point contributions in unit costs

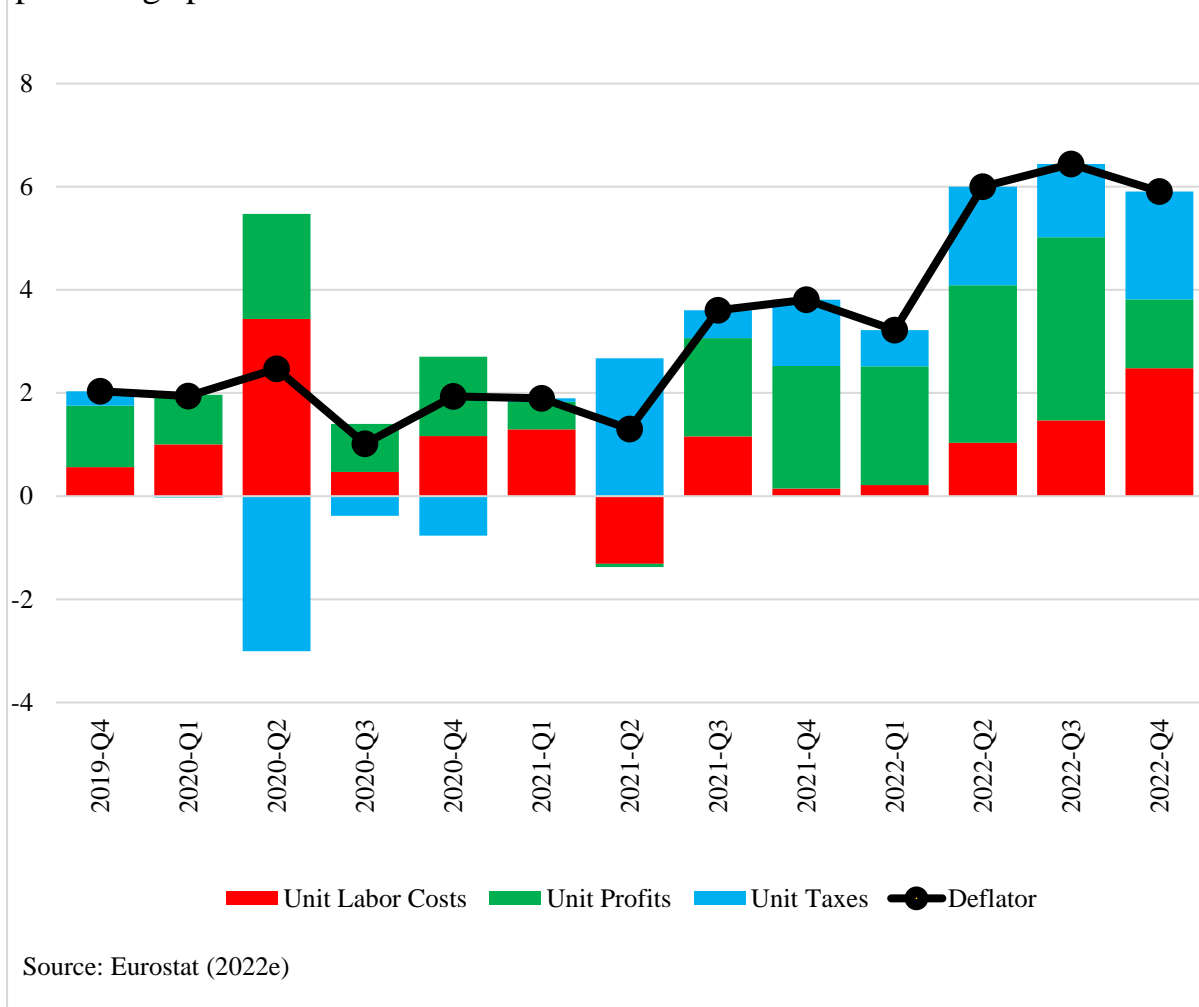
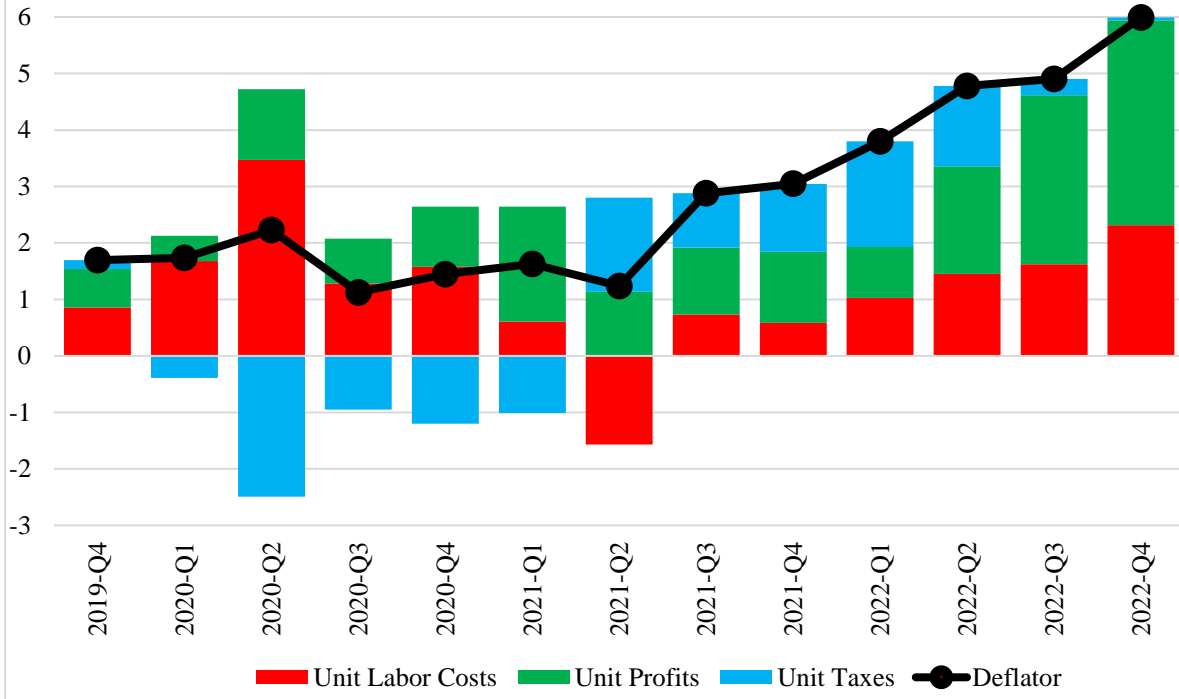


Figure 4: Distribution of Inflation in Sweden by Factor Shares 2019-Q4 to 2022-Q4

European Union: Decomposition of the GDP deflator at market prices by unit labor costs, unit profits and net taxes 2019-2022

*Percentage point changes from previous year's quarter;
percentage point contributions in unit costs



Source: Eurostat (2022e)

Figure 5: Distribution of Inflation in the European Union by Factor Shares 2019-Q4 to 2022-Q4

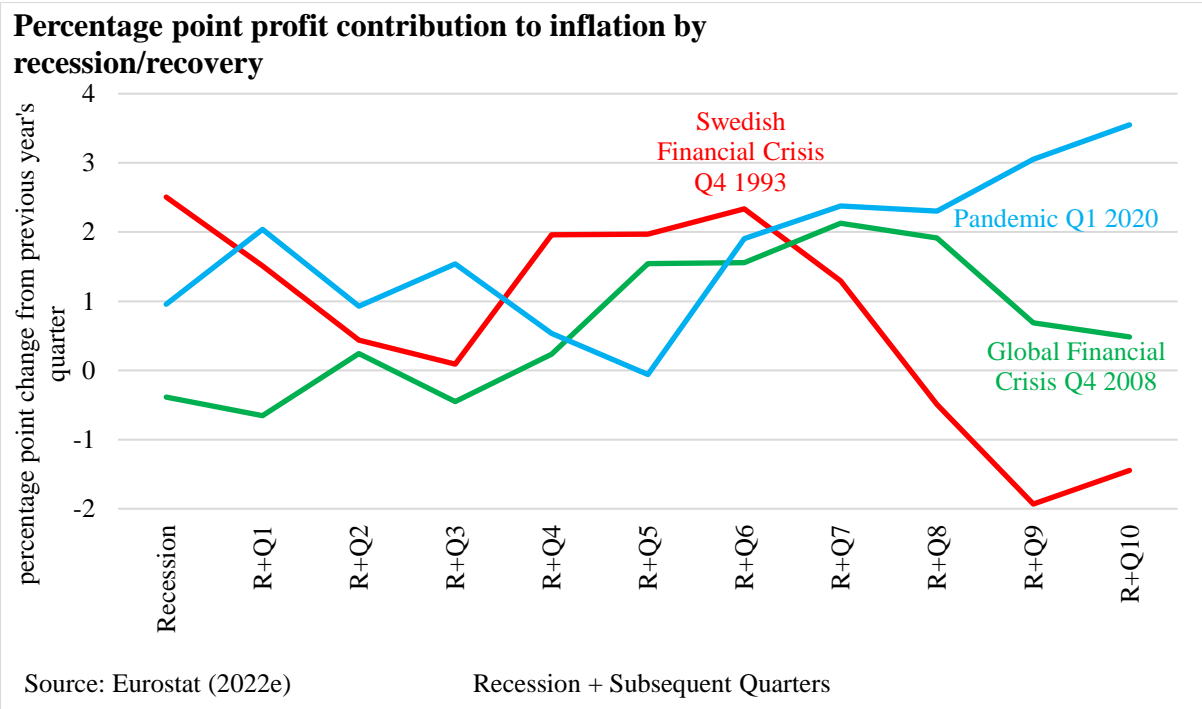


Figure 6: Percentage Point Contribution of Unit Profits During Economic Downturns

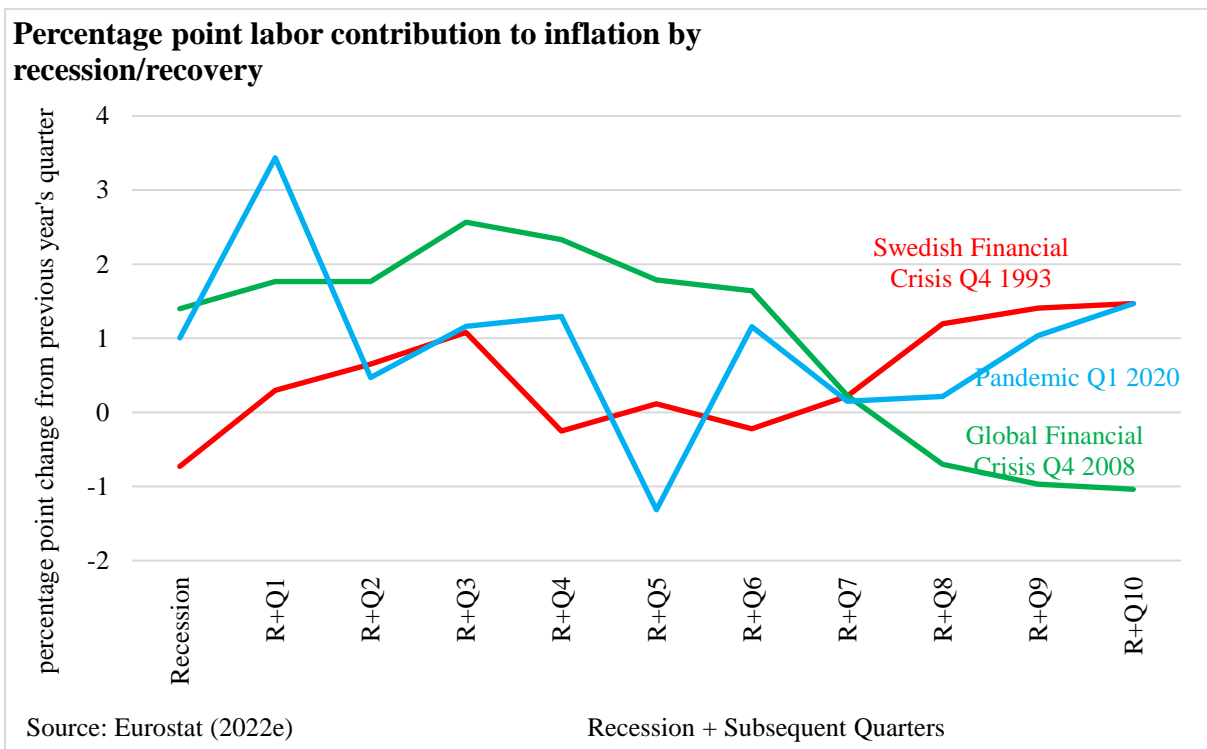


Figure 7: Percentage Point Contribution of Profits During Economic Downturns

6. 3 Inflation since 1994: the long-run trend

Although post covid-19 inflation appears to be driven by unit profits to a large part for Sweden (Figure 4), it is difficult to clarify if this pattern is different to the long run trend of inflation from 1994 and onwards. For instance, in Figure 8, the contribution of unit profits to movements in the GDP deflator is high in relative to unit labour costs and unit taxes for 1994, 1995, 2006, and even for 2014 and 2015. However, an important point to make is that inflation is significantly higher in 2022 compared to previous years, which can make the effect of inflation more recognizable for the public.

Over time it is also interesting to see that unit profits report negative percentage point contributions more times than unit labour costs. This can be interpreted as a “shrink in unit profits” stabilizing the price level. Unlike the economic downturn of 2019/2020 the global financial crisis of 2008 was accompanied by a dominating contribution of unit labour costs to inflation (Figure 8), that followed up until 2010. At this point unit profits made a return and unit labour cost showed a negative percentage point contribution. By the end of the financial crisis in Sweden around 1994, unit profits were the main contributor to inflation up until 1996, and never regained its strong position in relation to unit labour costs and unit taxes before 2010.

Figure 9 entails a more detailed breakdown of the GDP deflator by including quarterly movements in the GDP deflator. Just like in Figure 8, it is difficult to observe a general pattern of the contribution of each unit cost to inflation. Both unit labour costs and unit profits prove a volatile pattern that appears even stronger in the quarterly GDP deflator. Again, the only clear pattern is the strong contribution of unit profits to the high levels of inflation observed during 2022. However, by the last quarter of 2022, unit labour cost seems to be making a comeback at the expense of unit profits.

Figure 10 allows for a comparison between inflationary pressures in Sweden and the European Union to be made. Just like in Sweden, no clear trend can be observed. However, both unit profits and unit labour costs are more “stable” compared to Sweden and do not report as many negative percentage point contributions over time. The proportions between the contribution of unit profits and unit labour costs are also more stable. During the global

financial crisis of 2008, unit labour costs remained quite stable in their contribution to inflation, whilst unit profits and unit taxes took a negative percentage point hit. This is different to what can be observed for the economic downturn of 2019/2020, where unit labour costs still contributed to inflationary pressures in a larger proportion than unit profits up until 2021. Overall, Sweden and the European Union show similar inflation levels over time, with no clear tendency for one unit cost to dominate underlying price pressures. However, unit profits and unit labour costs appear less volatile in the European Union compared to Sweden.

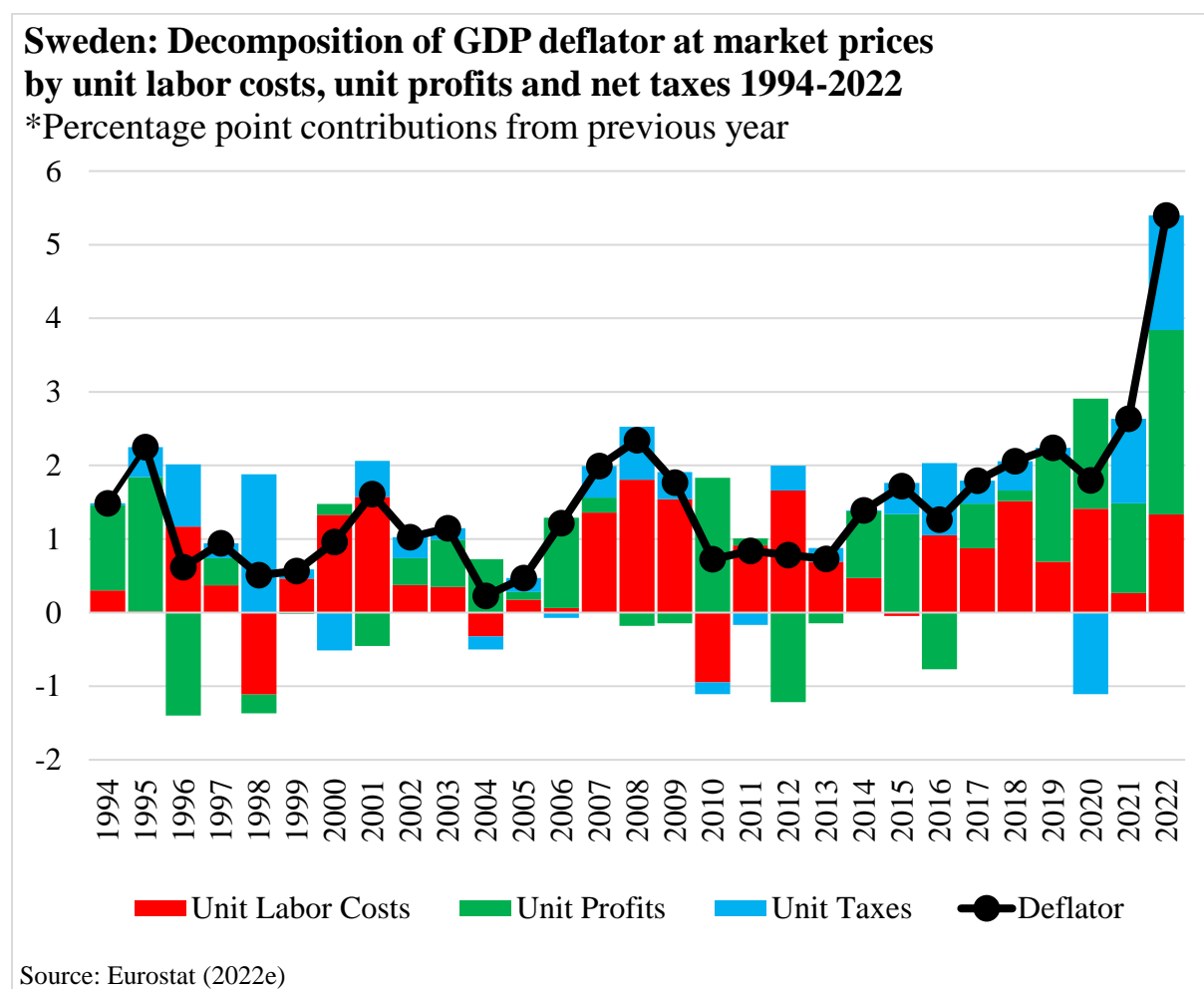
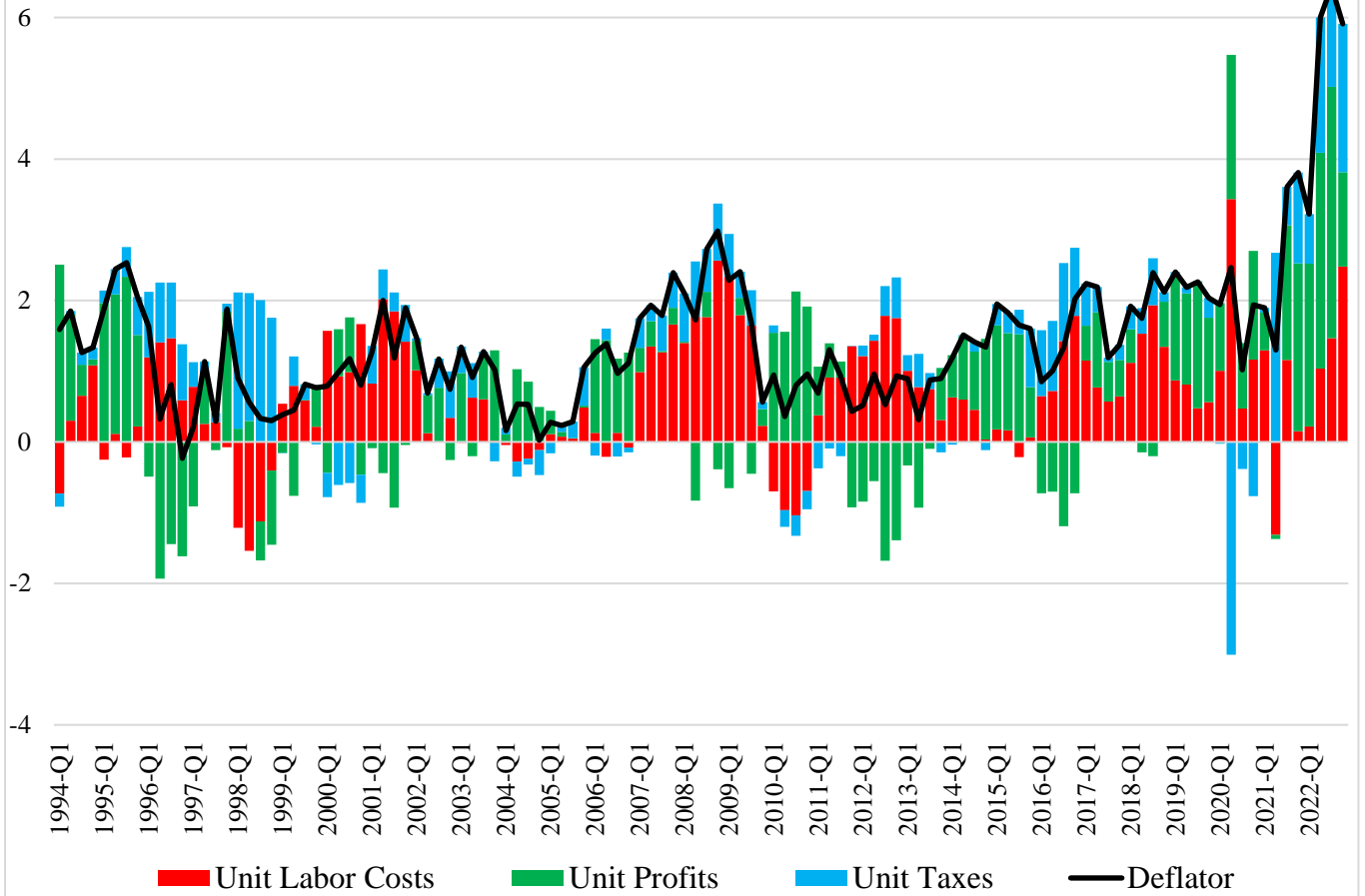


Figure 8: Distribution of Inflation in Sweden by Factor Shares 1994-2022

Sweden: Decomposition of quarterly GDP deflator at market prices by unit labor costs, unit profits and net taxes 1994-2022
 *Percentage point changes from previous year's quarter; percentage point contributions in unit costs

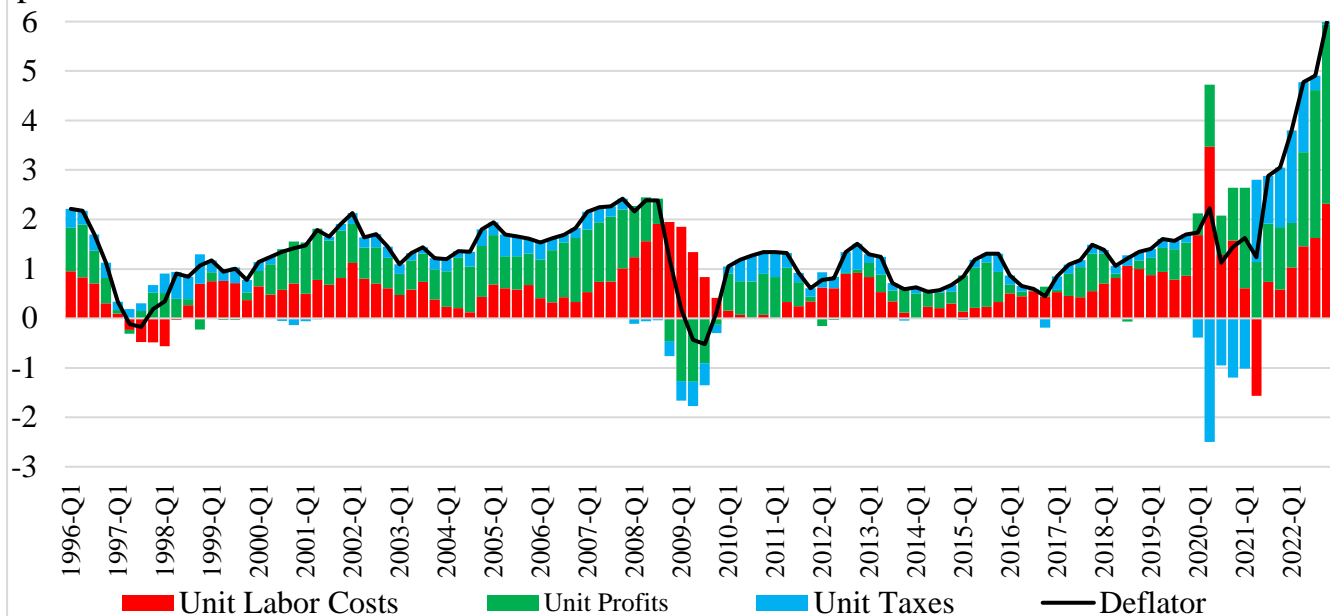


Source: Eurostat (2022e)

Figure 9: Distribution of Annual Inflation on a Quarterly Basis in Sweden by Factor Shares 1994-2022

European Union: Decomposition of the quarterly GDP deflator at market prices by unit labor costs, unit profits and net taxes 1996-2022

*Percentage point changes from previous year's quarter; percentage point contributions in unit costs



Source: Eurostat (2022e)

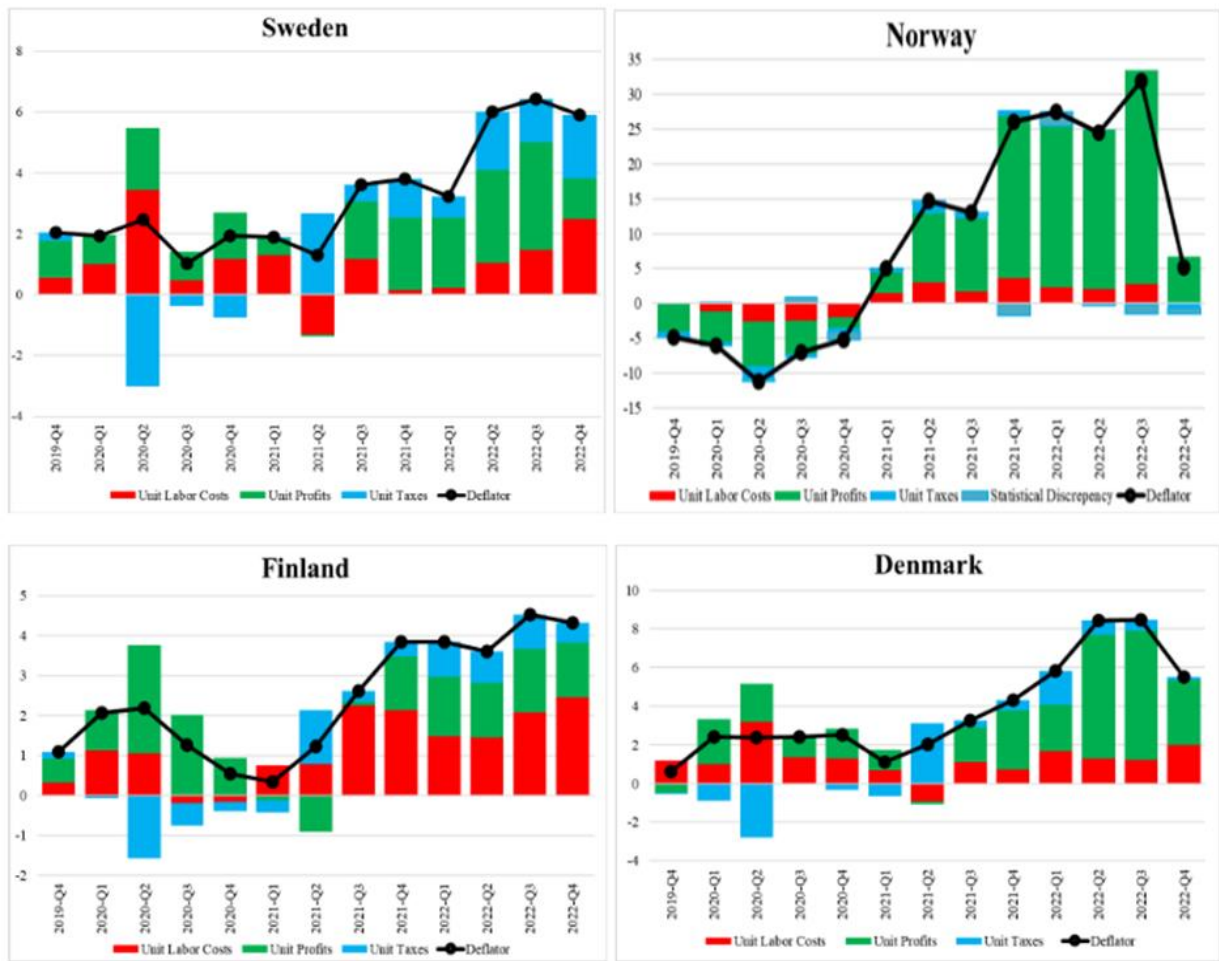
Figure 10: Distribution of Annual Inflation on a Quarterly Basis in the European Union by Factor Shares 1996-2022

6. 4 Comparison between Sweden and the Nordic Countries

Overall, the results presented in previous paragraphs point to a clear contribution of unit profits to domestic price pressures in Sweden, although the long run trend from 1994-2022 shows no clear pattern in the contribution of each factor share to the evolution of inflation.

Compared to its neighbouring countries, Swedish inflation levels are close to Finland and Denmark. Norway deviates strongly from inflation levels with swings in inflation several percentage points higher (Figure 11). Regarding the contribution of unit profits to inflationary pressures Norway also stands out. Although unit profits have played a big role in the contribution to inflation during 2022, this has been especially true for Norway. In the last quarter of 2022, unit profits compared to unit labor costs dominated underlying price pressures. In Finland, inflation has on average been lower and so also the contribution of unit profits. Moreover, the distribution of unit costs and their contributions to inflation has been

more even. Unlike all other Nordic countries unit labour costs have had a stronger impact than unit profits on the outlook of inflation for Finland.



Source: Eurostat (2022e)

Figure 11: Comparison of the Distribution of Annual inflation on a quarterly Basis in the Nordic Countries by Factor Shares 2019-2022 1996-2022

7. Analysis and Discussion

7.1 Who Bears the Burden of Inflation? The Functional Distribution of Income and its Impact on the Outlook of Inflation

In this thesis, the GDP deflator has been decomposed into unit profits, unit labour costs, and unit taxes. The most important findings of this study related to its research questions include the strong contribution of unit profits to post covid-19 inflation in Sweden and the found difficulties in proving an obvious long run trend in the movements of underlying price pressures between profits and labour costs over time. Post covid-19 inflation in Sweden has to a large degree been like inflation in the Nordic Countries and the European Union regarding the contribution of unit profits to underlying price pressures. However, as previously noted, inflation in Norway has been exceptionally high, and unit profits is a big contributor to this. An explanation to this could be that Norway is a known oil exporter and that volatile energy markets caused oil export related profits to increase. In this regard, Norway might replicate Canada, who as pointed out by Macdonald (2023) saw most profits ending up in oil related industries. Overall, an important insight is that the contributing role of unit profits to inflation is not a unique Swedish experience compared to the European Union and its neighbouring countries.

In many ways, the findings of this thesis relate back to the theoretical part of this paper and show a predicted outlook of the contribution of unit labour costs and unit profits to inflation corresponding to Piketty's claims on varying factor shares over time, which again can be noted in Figure 2 and 3. In essence, the distribution of underlying price pressures is to a high degree a reflection of the outlook of factor shares in an economy. If factor shares are varying, this should mean that their influence on inflationary pressures should mirror this. Indeed, this has been the case for both Sweden and the European Union found in the results. No constant distribution between unit labour costs and unit profits is observed in Figure 9 or 10. If one would apply the theoretical predictions made by neoclassical economics to the outlook of inflation, this would mean that the contribution of each factor share should be stable over time. This has not been the case. Another way to interpret the neoclassical assumption of $\frac{3}{4}$ of national income ascribed to labour, is that the labour share should have a stronger contributing power to movements in the GDP deflator, compared to the capital share. In the

findings of this thesis, the percentage point contribution to changes in the GDP deflator has been big for unit profits relative to unit labour costs (Figure 2 & 3) especially in proportion its claim of national income (Figure 4 & 5). This means that as the price level has increased, the profit share of national income has grown larger, which further confirms an inconstant pattern in factor shares.

Although factor shares for both Sweden and the European Union did prove to fluctuate over time, this variation is not drastic. However, as noted, inflation during the last two-to-three years, compared to the last three decades, has been high, therefore probably making rising costs more recognizable to the public. Indeed, if inflationary pressures are higher, and so also living costs, the distributional effects between capital and labour might appear more obvious than if the price level is increasing in a more moderate rate.

Although this study is descriptive, and does not establish a clear association between variables, the results presented allow for interpretations of where the burden of inflation has fallen during 2022. The outcome of most price increases during 2022 have been allocated to the profit share of national income. This is clear in the growing proportional size of unit profits between Q3-2021 to Q3-2022 (Figure 4 & 5). As the rate of inflation has increased, the capital share of income has grown larger (Figure 2 & 3). However, the capital share started growing already in 2018, whilst the labour share started falling in 2020 for both the European Union and Sweden. If factor shares are interpreted as the grade of economic power in relation to each other, the capital share entered the pandemic with its economic power having gradually increased the period before, whilst the labour share only saw a mildly increase in its share of national income, before eventually started dropping in 2020 (Figure 4 & 5). This means that the capital share entered the pandemic with its claim of national income growing and has been on an upward trend since then.

Lastly, one interesting point stands out in regard to the impact that factor shares have on the outlook of labour's and profit's contribution to underlying price pressures. In theory, the contribution of each factor share to inflationary pressure should reflect their relative stance towards each other. However, although factor shares and underlying price pressures appears

to vary over time, it is difficult to know the causality between these changes. For instance, during 2022, unit profits contribution to inflationary pressures in relationship to unit labour costs was greater than their share of national income compared to labour (compare Figure 3 & 4 with 5 & 6). In theory, since the labour share is bigger than the capital share, their impact on inflation should be in the same proportion. Notably, this has not been the case. Potentially, there might be a lag in the capital share so that when the contribution of unit profits to inflation is increasing over time, eventually the capital share will follow. However, this would mean that unit profits are growing larger from “inflationary shocks” in the economy that causes more money to be allocated to profits rather than labour costs. This could possibly be true based on the current economic landscape. The global economy notably has been experiencing multiple inflationary shocks in the form of Ukraine war, supply disturbances, rapidly increasing post covid-19 demand, and rising energy costs with large pass-through effects on the rest of the economy. It is therefore difficult to know for how long unit profits will continue to have a strong influence on inflationary pressures, or if the distribution between each factor share will stabilize. However, as current inflation has been the result of both cost-push and demand-pull factors working together in raising the price level, more money has gradually been allocated to the profit share.

7. 2 Inflation and Inequality and Fairness

Again, unit profits seem to have played a substantial role in the contribution to inflationary pressures in Sweden, the European Union and the Nordic countries. For Sweden, growth in profits have happened simultaneously as inflationary negative pressures on the purchasing power for households and a substantial drop in real wages. Indeed, these developments are important for how fair the “tackling” of inflation is perceived to be, and how equal the distribution of economic outputs is believed to be by a society’s citizens. Although increasing profit shares can arise from different sources, they signify a stronger concentration of economic gains amongst capital owners. This is especially concerning since capital income and ownership already is more concentrated than labour income. A continued growing profit share can therefore be interpreted as an intensification of income inequality as long as capital ownership and income remains concentrated, which is described as the usual case according to both Milanovic (2015) and Piketty (2014).

Based on the development of factor shares during the last four to three years, a redistribution of national income in favour of profits is noticeable in Sweden. Again, when inflation reaches levels seen in 2022, this development becomes even more obvious. Public dissatisfaction with rising profits during a cost-of-living crisis points to the fragility of the distributional system and how quickly it can lose its legitimacy. Moreover, growing criticism towards the legitimacy of firms pricing power might spill over to a broader view of markets that will hurt their efficiency. Moreover, these developments points to a relevance of the debate on distributional issues that has, and likely will continue to be important throughout history.

If compared to previous economic downturns, and inflation over time, unit profits have showed stronger resilience than unit labour costs. Recalling that the ECB referred to unit profits as a buffer to stabilize price pressures during the last financial crisis of 2008-2009, for 2019-2022, unit labour costs seem to have taken on a similar role. In this regard, negative real growth rates, and a slow growth in unit labour costs in proportion to labour's share of national income, can be argued to have worked as a dampening effect on inflation. It is difficult to find a clear answer to the fairness of this development, but it is still noteworthy that most income takers, those who receive their income through employee compensation, are paying the price for the richness's achieved by a minority during rising costs. Moreover, negative real wage growth might cause greater inequality between those who derive most of their household income from labour and those who derive it from capital when the profit share is increasing.

7. 3 The Functional Distribution of Income and Inflation Expectations

Although decreasing inequality and economic fairness can have negative effects on the economy through increased instability and distrusts in markets, it is also interesting to consider the effects that a disproportionate distribution of inflationary pressures between capital and labour can have on inflation expectations. Indeed, inflation expectations are a key factor in the outlook of actual inflation. Hence, factor shares can be useful in describing the relative bargaining power of each factor of production and how these impact price and wage negotiations. For instance, the economic influence between capital and labour, and their price

and wage setting powers, can be mirrored by their claimed share of national income. These insights are especially interesting to the formation of inflation expectations. If the distribution of underlying price pressures is perceived to be unfair, this might cause the “losing” side to demand revenge in the form of higher wage increases in the future to make up for their lost purchasing power. Indeed, if the labour force expects for prices to increase, and for firms to continue to make profits in the future, this will possibly impact wage negotiations as demands for proportionately higher wages may arise. Ultimately, this might cause the price level to increase even further. This process is likely to intensify when the fairness of the outcome of inflation is threatened. If more and more people expect for an unequal distribution of inflationary pressures to continue, this can cause inflationary expectations to drive up actual inflation even higher or make attempts of stabilizing the price level more difficult when profits and prices are believed to continue to increase in the future.

In essence, what is described above is a situation where higher demands from the labour force for wage increases is argued to drive up other costs in the economy much like a wage-price-spiral. Throughout 2022, this does not seem likely based on the data presented in this thesis from neither Sweden, the Nordic countries (although Finland display a more balanced distribution between labour and profits throughout the period) (Figure 11), nor the European Union (Figure 10). However, for Sweden and all Nordic countries except for Norway, the contribution of unit labour costs to inflationary pressures is increasing by the fourth quarter of 2022. For Sweden, growing unit labour costs are accompanied by shrinking unit profits which could mean that the distribution between capital and labour is becoming more even in their impact on inflation. Another way to interpret this development is the possibility that unit labour cost will continue to increase in the future and that this will make regaining price stability more difficult when higher wages are pressuring the price level further, instead of profits. Although it still is soon to make any reliable predictions about the possibility of this phenomenon, they point to the important role of inflation expectations on the outlook of actual inflation.

8. Conclusion

In accordance with the aims of this thesis, post covid-19 inflation, as well as inflation since 1994, have been examined through a breakdown of the GDP deflator into unit costs. 2022 has witnessed remarkably high levels of inflation on a global level, with more concerns raised on a potential difference in impact of rising costs between workers and firms. The result of this thesis points to a strong contribution of unit profits, relative to unit labour costs, on the outlook of inflation during 2019-2022. This is not only the case for Sweden, but for the Nordic Countries (except for Finland), and the European Union. Hence, Sweden is not unique in this regard. Although unit labour cost has played a lesser role during last three years of inflation, during the global financial crisis of 2008, unit labour costs were a bigger contributing factor to price pressures than unit profits. This makes the current economic downturn different from the previous one.

Over the longer run, the distributional impact of unit profits and unit labour costs on inflation have varied, and no clear pattern can be depicted in the movements of each unit cost. This is true for both Sweden, and the entirety of the European Union. This could be explained as the outcome of varying factor shares over time. Between the years of 1993-2022, factor shares for both Sweden and the European Union have varied, which is mirrored in the outlook of inflationary pressures that are not constant between labour and capital. The fact that factor shares has varied over time contradicts neoclassical claims of constant factor shares traditionally ascribing $\frac{3}{4}$ of national income to labour and $\frac{1}{4}$ of national income to capitals as is described in the Cobb-Douglas Production Function.

The main findings of this thesis confirm claims that have been made by more scholars on the need to re-evaluate some of the most common frameworks used to explain the rise of inflation, and to give the relationship between increasing profits and increasing inflation more attention. Frameworks often used that claim wages, rather than profits, to drive up inflation does not seem to optimally capture the reality of current inflation that are causing real wages to drop in many parts of the world. Instead, closer detail should be given to explore other explanations of contributions to such drastic increases in the price level as has been witnessed during 2022. Lastly, the immense impact that inflation has had on the everyday life of people

globally has been almost impossible to ignore. As higher price levels continue to hurt economically vulnerable households disproportionately, more research should be devoted to investigating the role that increasing profits potentially have on the outlook of inflation.

REFERENCES

Arce, O., Koester, G., & Nickel, C. (2023). One year since Russia's invasion of Ukraine - the effects on euro area inflation, web blog post, Available at:

<https://www.ecb.europa.eu/press/blog/date/2023/html/ecb.blog20230224~3b75362af3.en.htm> [Accessed 13 May 2023]

Atkinson, A. (2009). Factor shares: the principal problem of political economy?, *Oxford Review of Economics*, vol. 25, no. 1, pp. 3-16, Available online:

<https://academic.oup.com/oxrep/article/25/1/3/359627> [Accessed 10 April 2023]

Atkinson, A., Piketty, T., & Saez, E. (2011). Top Incomes in the Long Run of History, *Journal of Economic Literature*, vol. 49, no. 1, pp. 3-71, Available online:

<https://eml.berkeley.edu/~saez/atkinson-piketty-saezJEL10.pdf> [Accessed 22 April 2023]

Autor, D., Dorn, D., Katz, L., Patterson, C., & Van Reenen, J. (2020). *The Quarterly Journal of Economics*, vol. 135, issue. 2, pp. 645-709, Available online:

<https://academic.oup.com/qje/article/135/2/645/5721266> [Accessed 15 April 2023]

Barkai, S. (2020). Declining Labor and Capital Shares, *The Journal of Finance*, vol. 175, issue. 5, pp. 2421-2463, Available online:

<https://onlinelibrary.wiley.com/doi/full/10.1111/jofi.12909> [Accessed 3 March 2023]

Bauman, U., Westerman, T., Darraq Paries, M., & Riggi, M. (2021). Inflation expectations and their role in Eurosystem forecasting, Occasion Paper Series, no 264, European Central Bank, Available online

<https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op264~c8a3ee35b5.en.pdf> [Accessed 12 May 2023]

Bengtsson, E., & Waldenström, D. (2018). Capital Shares and Income Inequality: Evidence from the Long Run, *The Journal of Economic History*, vol. 78, issue 3, pp. 712-743, Available online: <https://www.cambridge.org/core/journals/journal-of-economic-history/article/capital-shares-and-income-inequality-evidence-from-the-long-run/CA36D0F50F1AA476A44A0E43F8096639> [Accessed 10 April 2023]

Blaikie, N. (2003). *Analyzing Quantitative Data: from Description to Explanation*, London: Sage Publications Ltd

Biddle, J. (2020). *Progress Through Regressions: the Life Story of the Empirical Cobb-Douglas Production Function*, [e-book] Cambridge: Cambridge University Press, Available through: <https://lubcat.lub.lu.se/cgi-bin/koha/opac-detail.pl?biblionumber=7371897> [Accessed 28 April 2023]

Bivens, J. (2022). Corporate profits have contributed disproportionately to inflation. How should policymakers respond?, web blog post, Available at: <https://www.epi.org/blog/corporate-profits-have-contributed-disproportionately-to-inflation-how-should-policymakers-respond/> [Accessed 29 January 2023]

Carlén, T. (2018). Löneledd tillväxt Vad säger forskningen? [pdf], Available at: [https://lo.se/home/lo/res.nsf/vRes/lo_fakta_1366027478784_loneledd_tillvaxt_pdf/\\$File/Loneledd_tillvaxt.pdf](https://lo.se/home/lo/res.nsf/vRes/lo_fakta_1366027478784_loneledd_tillvaxt_pdf/$File/Loneledd_tillvaxt.pdf) [Accessed 23 March 2022]

Carlén, S., & Lind, D. (2023). Årets fattiga dag - men handlarna slår rekord, *Arbetsvärlden*, 23 January, Available online: <https://www.arbetsvarlden.se/debatt/arets-fattigaste-dag-men-handlarna-slar-rekord/> [Accessed 10 May 2023]

Cobb, C., & Douglas, P. (1928). A Theory of Production, *The American Economic Review*, vol. 18, no. 1, pp. 139-165, Available online: <https://www.jstor.org/stable/1811556> [Accessed 27 April 2023]

Creswell, J. (2014). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*, California: SAGE Publications Inc

Charpe, M., Bridji, S., & McAdam, P. (2019). Labor share and growth in the long run, European Central Bank, working paper, no.2251,

Dimova, D. (2019). The Structural Determinants of the Labor Share in Europe,

Dousa, B. (2022). LO och Riksbanken har fel om greedflation, *Dagens Industri*, 14 juli 2022, Available online: <https://www.di.se/ledare/lo-och-riksbanken-har-fel-om-greedflation/> [Accessed 10 May 2023]

European Central Bank. (2013). The Role of Profits in Shaping Domestic Price Pressures in the Euro Area, the *Monthly Economic Bulletin*, Issue 2, pp. 51-56, Available online: <https://www.ecb.europa.eu/pub/pdf/mobu/mb201303en.pdf> [Accessed 10 March 2023]

European Central Bank. (2006). Using National Accounts to Gauge Price Pressure in the Euro Area, the *Monthly Economic Bulletin*, Issue 8, p. 52-64, Available online: <https://www.ecb.europa.eu/pub/pdf/mobu/mb200612en.pdf> [Accessed 5 March 2023]

Eurostat. (2013). European system of accounts [pdf], Available at: <https://ec.europa.eu/eurostat/documents/3859598/5925693/KS-02-13-269-EN.PDF/44cd9d01-bc64-40e5-bd40-d17df0c69334> [Accessed 10 April 2023]

Eurostat. (2023a). Glossary: Consumption of fixed capital, Available online: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Consumption_of_fixed_capital_\(CFC\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Consumption_of_fixed_capital_(CFC)) [Accessed 10 April 2023]

Eurostat. (2023b). Glossary: Calendar adjustment, Available online: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Calendar_adjustment [Accessed 20 April 2023]

Eurostat. (2023c). Glossary: Gross Operating Surplus, Available online: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_operating_surplus_\(GOS\)_-_NA](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_operating_surplus_(GOS)_-_NA) [Accessed 10 April 2023]

Eurostat. (2023d). Research and Methodology - Methodology - Seasonal Adjustment, Available online: <https://ec.europa.eu/eurostat/web/research-methodology/seasonal-adjustment> [Accessed 25 April 2023]

Eurostat. (2023e). *Quarterly National Accounts Data* GDP and main components (output, expenditure and income), Available online at: https://ec.europa.eu/eurostat/databrowser/view/NAMQ_10_GDP/default/table?lang=en [Accessed 29 March 2023]

Giovannoni, O. (2014). What Do We Know About the Labor Share and the Profit Share? Part III: Measures and Structural Factors, Levy Economics Institute, working paper, no. 805, Bard College

Glover, A., Mustre-del-Río., & Ende-Becker, A. (2022). How Much Have Record Corporate Profits Contributed to Recent Inflation?, *Economic Review*, Available online: <https://www.kansascityfed.org/research/economic-review/how-much-have-record-corporate-profits-contributed-to-recent-inflation/> [Accessed 8 February 2023]

Glyn, A. (2011). Functional Distribution and Inequality, in Nolan, B., Salverda, W., & Smeeding (eds), *The Oxford Handbook of Economic Inequality*, Oxford University Press, pp. 101-126

Guerreiro, M. (2012). The Labour Share of Income around the World. Evidence from a Panel Dataset, Economic Development International Conference of GREThA/GRES, working , Available online: <http://piketty.pse.ens.fr/files/Guerreiro2012.pdf> [Accessed 10 April 2023]

International Labor Organization. (2023), Global Wage Report 2022-23, Available online: <https://www.ilo.org/digitalguides/en-gb/story/globalwagereport2022-23> [Accessed 18 March 2023]

Konczal, M., & Lusiani, N. (2022). Prices, Profits, and Power: An Analysis of 2021 Firm-Level Markups, *Roosevelt Institute*, Available online: https://rooseveltinstitute.org/wp-content/uploads/2022/06/RI_PricesProfitsPower_202206.pdf [Accessed 10 February 2023]

Medlingsinsitutet. (2023). Löneutvecklingen i Sverige till och med februari 2023 [pdf], Available at: <https://www.mi.se/lonestatistik/konjunkturlonestatistik/> [Accessed 21 May 2023]

Macdonald, D. (2023). Where are your inflationary dollars going?, Available online: <https://monitormag.ca/reports/where-are-your-inflation-dollars-going/> [Accessed 10 april 2023]

Mankiw, G., & Taylor, P. (2020). *Macroeconomics*, Singapore: Seng Lee Press

Mankiw, G., & Taylor, P. (2016). *Macroeconomics*, New York: Worth Publishers

Milanovic, B. (2015). Increasing Capital Income Share and Its Effect on Personal Income Inequality, MRPA Paper 67611, Available online: <https://ideas.repec.org/p/pramprapa/67661.html> [Accessed 12 May 2023]

National Institute of Economic Research. (2022). Konjunkturläget December 2022, Available online: <https://www.konj.se/download/18.1d35c93d1852997ae3212bb4/1671547869607/KLDec2022.pdf> [Accessed 3 May 2023]

OECD. (2022a). Minimum wages in times of rising inflation, *Policy Briefs Coping with the Cost of Living Crisis*, Available online: <https://www.oecd.org/social/coping-with-the-cost-of-living-crisis.htm> [Accessed 10 March 2023]

OECD. (2022b). Competition and inflation, *OECD Competition Policy Roundtable Background Note*, Available online: <https://www.oecd.org/competition/competition-and-inflation.htm> [Accessed 4 April 2023]

Panetta, F. (2023). Everything everywhere all at once: responding to multiple global shocks, Available online: https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230322_2~af38beedf3.en.html

Persson, I. (2022). Girighet höjer priser här i Sverige också företagen passar på att höja marginalen, *Aftonbladet*, 14 November, Available online: <https://www.aftonbladet.se/ledare/a/gEwVz1/girighet-hojer-priser-har-i-sverige-ocksa> [Accessed 10 May 2023]

Piketty, T. (2017). *Kapitalet i tjugoförsta århundradet*, Falun: Scandbook AB

Piketty, T. (2014). *Capital in the Twenty-First Century*, Cambridge: Harvard University Press

Piketty, T., & Zucman, G. (2014). Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010, *The Quarterly Journal of Economics*, vol. 129, issue 3, pp. 1255-1310, Available online: <https://academic.oup.com/qje/article/129/3/1255/1818714> [Accessed 10 May 2023]

Reserve Bank of Australia. (2022). Causes of Inflation. Available online: <https://www.rba.gov.au/education/resources/explainers/causes-of-inflation.html> [Accessed 10 May 2023]

Ricardo, D. (1821). *On the Principles of Political Economy and Taxation*, [e-book], Kitchener: Batoche Books, Available online:

[https://www.academia.edu/9590527/On the Principles of Political Economy and Taxation](https://www.academia.edu/9590527/On_the_Principles_of_Political_Economy_and_Taxation) [Accessed 30 April 2023]

Roine, J., & Waldenström, D. (2008). The evolution of top income in an egalitarian society: Sweden, 1903-2004, *Journal of Public Economics*, vol. 92, no.1-2, pp. 366-387, Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1300564 [Accessed 1 May 2023]

Roine, J. (2014). *Thomas Piketty's Kapitalet I det tjugoförsta århundradet sammanfattning svenskt perspektiv*, Stockholm: Volante

Schnabel, I. (2022). Lecture: the globalisation of inflation, presentation slides, Conference organized by the Österreichische Vereinigung für Finanzanalyse und Asset Management, 11 May 2022

Statistics Sweden. (2022a). Matpriser stiger lika kraftigt som på 1980-talet, Available online: <https://www.scb.se/hitta-statistik/redaktionellt/matpriser-stiger-lika-kraftigt-som-pa-80-talet/> [Accessed 19 march 2023]

Statistics Sweden. (2022b). Svängande elpriser påverkar KPI, Available online: https://www.scb.se/hitta-statistik/temaomraden/sveriges-ekonomi/fordjupningsartiklar/Sveriges_ekonomi/svangande-energipriser-paverkar-kpi/ [Accessed 19 march 2023]

Statistics Sweden. (2022c). Consumer Price Index, Available online at: <https://www.scb.se/hitta-statistik/statistik-efter-amne/priser-och-konsumtion/konsumentprisindex/konsumentprisindex-kpi/pong/tabell-och-diagram/konsumentprisindex-kpi/inflationstakten-enligt-kpi/> [Accessed 29 march 2023]

Stiglitz, J., & Regmi, I. (2022). The Causes of and Responses to Today's Inflation, *Roosevelt Policy Institute*, Available online: <https://rooseveltinstitute.org/publications/the-causes-of-and-responses-to-todays-inflation/> [Accessed 1 May 2023]

Syverson, C. (2019). Macroeconomics and Market Power, *The Journal of Economic Perspectives*, vol. 33, no. 3, pp. 23-43, Available online: <https://www.aeaweb.org/articles?id=10.1257/jep.33.3.23> [Accessed 10 March 2023]

Swedish National Bank. (2022). Penningpolitisk rapport Februari, Available online: <https://www.riksbank.se/sv/penningpolitik/penningpolitisk-rapport/2023/penningpolitisk-rapport-februari-2023/> [Accessed 2 April 2023]

Vinod, H. (2022). Greedflation from Causal Paths between Profits and Inflation, pp. 1-22, Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4134413 [Accessed 10 February 2023]

Weber, I., & Wasner, E. (2023). Sellers' inflation, Profits and Conflict: Why can Large Firms Hike Prices in an Emergence?, Economics Department, Working Paper, no 343, University of Massachusetts Amherst [Accessed 10 April 2023]