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WAR INFLATION AND TAXATION

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Title: War inflation and taxation

Abstract:

Warfare has been commonly associated with increasing levels of inflation, with important implications for tax systems. In this chapter, we first review the literature on war finance and inflation, considering both the fiscal causes of inflation during wartimes and the effects of inflation on tax revenues. Second, we focus on developments in the income tax during the World Wars, building upon our previous work (Torregrosa-Hetland and Sabaté, 2022). We describe the mechanisms through which inflation affected progressivity and redistribution, by reducing the real value of exemptions, brackets and deductions ("bracket creep"). This led to the incorporation of new taxpayers into the income tax system and increased significantly the tax burden of those already included. Third, we study the issue of income tax legitimacy in the face of war inflation using a novel dataset of parliamentary debates and press articles in the United Kingdom. Other episodes of bracket creep have been associated with legitimacy challenges. We use natural language processing techniques to examine whether the effects of inflation on tax progressivity were a topic of discussion in national parliaments and the press, and the extent to which MPs and journalists identified inflation as a challenge to income tax legitimacy.

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Introduction

Wartime inflation has been a preoccupation of policymakers and scholars alike for a long time. It has profound economic implications, from lowering the cost of servicing debt to decreasing the real value of social transfers, all of which have acute consequences in the economic agents' incentives and, ultimately, on macroeconomic fundamentals such as economic growth and inequality. It can also have serious political consequences, even eroding war legitimacy, to the extent that the prime minister of the United Kingdom, William Pitt, reportedly conceded during the Napoleonic Wars that "he was more afraid of high prices than he was of the enemy".[i] In this chapter we review the literature on war inflation and fiscal policies, with an emphasis on the effects that rising prices have on taxation, and present novel evidence regarding the attitudes of policymakers and the public on these issues during the World Wars in the United Kingdom.

In the literature review we stress the importance of the effects that inflation has on fiscal policies, something that has not received the attention it probably deserves. Taxes will be affected by inflation depending on how sensitive they are to nominal prices, and to this effect we differentiate between taxes collected as a specific money amount, ad valorem taxes, and taxes with progressive schemes. While focusing on income taxes, we pay special attention to the two channels through which inflation can alter their redistributive effects, namely the size of the tax and its level of progressivity. Both have a positive impact on tax redistribution, and this might result in the rather counterintuitive scenario of an income tax scheme being less progressive over time but more redistributive (as long as the amount of revenue collected increases and the tax remains at least mildly progressive).

This is precisely what happened with the income tax in Sweden, the United Kingdom, and the United States during the World Wars. Revisiting the results of Torregrosa-Hetland and Sabaté (2022), we describe how wartime inflation reduced the progressivity of income taxes in these countries (in some cases by a relevant margin) but increased nonetheless their redistributive effect. These changes were of a significant relevance, as a large portion of income tax revenue was effectively raised by inflation (as much as 80% in Sweden, 64% in the United Kingdom, or 57% in the United States, by the end of World War I).

The last section of the chapter employs natural language processing techniques and a qualitative analysis of British parliamentary debates and editorials and letters to the editor of The Economist to examine the extent to which policymakers and the public were aware of this redistributive impact of inflation, and whether they were concerned about the potential erosion of tax legitimacy. We do find peaks of attention to inflation and the cost of living in debates about income tax reform during the two military conflicts (precisely when inflation was more acute), while attitudes towards inflation seem to grow particularly negative. However, our qualitative revision of the debates does not suggest that policymakers were fully aware of the effects of inflation on tax redistribution. Most discussions revolve around the impact of fiscal policies on inflation, as well as the difficulties of paying taxes and making ends meet due to rising prices. Even the concept of real prices is rarely considered, with the notable exception of the end of World War I, when several MPs discuss the implications of the erosion of the real value of exemption limits. The issues brought up in the editorials and the letters to the editor are largely coherent with what was being discussed in Parliament, with the editors being particularly strong proponents of financing the war through taxes and concerned about the need to prevent inflation and to divert private consumption to the war effort.

Our revision and results attest to the historical importance of inflation in the operation of taxes and their redistributive effects, and identifies relevant gaps in our knowledge on these issues. Most notably, future research should delve into the extent to which policymakers and the public have a good grasp of the economic and social implications of inflation, and whether their knowledge (or lack thereof) has informed (and informs) their fiscal policy decisions. Our qualitative analysis of the British case suggests that this was the case in certain policy issues (i.e., the inflationary pressures of financing the war through monetary expansion), but at the same time we have detected important blind spots that left some matters (i.e., the impact of inflation on the redistributive effects of income taxes) largely unattended by policymakers and the public alike.

War finance and inflation

Inflation has been a common feature of contemporary wars. According to Capella Zielinski (2016, 22), the average level of inflation during wars that lasted over six months long since 1800 has been almost 30% for primary belligerents, while in 41% of them inflation exceeded 10%. According to Daly and Chankova (2021), this was also common in early modern Europe, as the median level of inflation in the biggest 12 wars since 1300s (those with more than 2 million deaths rescaled to today's global population) peaked at 8% one year after the wars ended. In some countries, such as the United States, most periods of high inflation during the 19th and early 20th centuries were in fact driven by warfare (Rockoff, 2016).

Wars have spurred inflationary pressures largely through two different channels. First, as production is reoriented to meet the military demands and governments increase consumption, supply shortages of civilian goods and services can bring about generalized price rises. Second, and due to the sometimes explosive need for additional public resources, states might be financed through expansions of the monetary base, with additional inflationary effects.

Regarding the war production channel, this was certainly the case during the World Wars, where the principal belligerent countries geared their economies towards the war effort. For instance, during the mid-years of World War II, Germany, the USSR and the United Kingdom devoted more than half of their GNP to the military effort (Harrison, 1998). This was partially accomplished by mobilizing previously inactive resources, but also by diverting manpower and capital from civilian to military production. In the British case, employment diminished in all sectors expect for military services and munitions until 1943-44 (Broadberry and Howlett, 1998). Similarly, consumption per head in Germany fell significantly during the early years of the war, as consumer goods industries devoted as much as 40 to 50 percent of their output to the army. The mismatch between supply and demand resulted in a generalized increase in the prices of consumer goods, even though they were effectively constrained by rationing and price controls (Abelshauser, 1998).

The inflationary effects of supply shortages can be also observed in lower-scale wars, for example the Russian intervention in the Crimean War. As the Russian Empire was fighting in the Black Sea, prices of staples rose more in those provinces that were closer to the military operations (and therefore more exposed to supply disruptions). For instance, the price of rye flour increased nearly 200 percent in some of the southern and western provinces, whereas barely 10-20 percent in the further away provinces in the north, east and center. Similar patterns were found in other items, such as wheat and hay, albeit with different intensities (Pintner, 1959).

Supply shortages can also trigger inflationary pressures beyond the borders of belligerent countries. A clear example is the current war in Ukraine, which disrupted supply and made the global prices of energy and agricultural products soar during the first months of the conflict (Artuc et al. 2022, Ferriani and Gazzani, 2023). Even though prices had been rising in many countries well before the outbreak of the war due to the lifting of covid-19 restrictions, disruptions in the supply of gas and oil to highly dependent European countries, as well as in wheat and corn exports (of which Russia and Ukraine are major producers) exacerbated the tensions in international markets.

Beyond these cost-push inflation dynamics, fiscal and monetary policies also play a relevant role in the course of inflation during wartimes. On the one hand, financing military conflicts through taxes can contain the inflationary gap that arises from an overheated economy by reducing the purchasing power of consumers, as Keynes asserted in the early months of World War II (Keynes, 1940). Similarly, domestic bonds can mitigate inflationary pressures by postponing the spending power of consumers until the war ends (Rockoff, 2012), albeit, to a certain extent, this might simply defer such pressures to a further point in time. Wars, however, are rarely paid for by taxes or domestic loans alone. Money printing has been a common alternative in the financial toolkit of belligerent countries, which is widely understood as a key source of inflation (Taylor, 2021; Bordo and Levy, 2021). Seigniorage revenue has thus been named as a tax on cash balances or “inflation tax” (Cagan, 1956; Dornbusch and Fischer, 1991). This “inflation tax” may be actively pursued by governments (Reinhart and Rogoff, 2009), among other reasons because it allows to obtain additional public funds without raising taxes, which tend to make the population aware of the costs of war and erode war legitimacy (Flores-Macías and Kreps, 2017).[ii]

The experience of the World Wars is again particularly telling. While most countries increased taxation (Scheve and Stasavage, 2016), a significant portion of the war cost was funded through monetary expansion. This was clearly the case in Germany during World War I, where around three quarters of the floating debt issued until the end of 1916 was held by the Reichsbank (falling to 41% in early 1918), which resulted in an increase in the money supply of about 285 percent from December 1913 to December 1918 (Balderston, 1989). Even in countries with sounder wartime fiscal policies, money printing played a relevant role. For instance, Rockoff (2012) calculates that direct money creation (e.g., purchases of government debt by the central bank) and indirect money creation (e.g., bank loans derived from higher reserves) in the United States accounted for 30% and 23% of war finance in World War I and World War II respectively. As a result of these policies, the stock of money increased by more than 100% from 1939 to 1944, and inflation reached double digits in 1941-1942.

The Korean War and the Vietnam War provide a compelling contrast of different fiscal and monetary policies. The former was entirely financed by taxation in a context of a restrictive monetary policy implemented by the Federal Reserve (Rockoff, 2012). Already in September 1950, Congress enacted with an overwhelming majority an increase in income taxes, corporate taxes and excises, which were complemented by an excess profits tax in January 1951 and further tax increases under the Revenue Act of 1951. Prices soared nonetheless during the first year of the military conflict, as not-so-distant memories of wartime inflation rushed consumers to buy new consumer goods en masse. This was, in fact, an illustration of demand-pull inflation triggered by an initial consumption panic, rather than a trade-off between civilian and military production. In any case, the aforementioned tax increases, together with restrictive monetary policies and a price freeze introduced in January 1951, moderated inflation thereafter (in fact, as measured by the Producer Price Index, prices even decreased until the end of the war).

In a well-known turn of events, the Vietnam War was largely financed through printing money. During the first months of the US military intervention, the Johnson administration did not expect inflation to soar as the economy was supposed to absorb the new defense expenditure. Amid fears of economic recession and popular opposition to war, the government relied entirely on public debt to finance the first military operations (Capella Zielinski, 2016). Already in spring 1966, talks were held within the administration about the need to increase taxes to contain inflation, but a comprehensive fiscal package was not enacted until June 1968, when inflation had reached higher levels and amidst an escalation in the war. In this context, the administration was able to convince Congress to implement a temporary 10% surcharge on individual and corporate taxes and higher excises, while at the same time reducing expenditure. This timid and delayed fiscal reaction, as well as a persistent increase in the monetary base owing to the Federal Reserve's purchase of public debt (only counteracted with an increase in the discount rate and price controls), led to a period of substantial inflation lasting until 1980 (Rockoff, 2009, 2012, 2016).

An additional benefit of inflation for public finance is the reduction in the level of public debt and debt service in real terms (Reinhart and Sbrancia, 2015). Crafts (2016) has explored this effect during different post-war episodes in the United Kingdom. He shows that the debt to GDP ratio fell rapidly after World War II, in a context of relatively high inflation combined with financial repression.[iii] However, the experiences after World War I (with price deflation) or the Napoleonic wars (without consistent inflation) were much more difficult and contentious. During the nineteenth century, debt charges required over 50% of the gross expenditure of central government for several decades (Daunton, 2001, pp. 47-49), while the World War I public debt remained at high levels even until after 1933.

The monetization of wartime public debt and the ensuing inflationary pressures were also very much present in regions outside Europe and the US. In Latin America, for instance, inflationary tax resulting from outright money printing was widely used to pay for war during the nineteenth century. In Brazil during the War of the Triple Alliance, the amount of *milreis* in circulation increased from 29 million in 1864 to 151 million in 1870 (Centeno, 2002, 132). In fact, some have argued that political instability (Aisen and Veiga, 2006) and autocratic institutions (Narayan et al., 2011), which have characterized the institutional framework of some developing countries, exacerbate inflation due to low fiscal capacity and the subsequent tendency to rely on seigniorage as a source of public revenue.

In a nutshell, wartime inflation has been largely the result of supply shortages and fiscal and monetary policies. In the rest of the chapter, we will shift our attention to the *consequences* of wartime inflation on tax systems, and particularly to its redistributive effects, which remain less well understood.

Effects of inflation on taxation

A thriving literature has emerged in the last decades trying to unpack the redistributive effects of inflation, including its impact on the operation of tax systems (e.g., Doepke and Schneider, 2006; Süssmuth and Wieschemeyer, 2022; Ferreira et al., 2023; Moriana-Armendáriz, 2023). In a context of high inflation, such as during major wars, the erosion of the real value of tax thresholds can significantly shape the amount of revenue collected and the level of tax progressivity. This is relevant in terms of the capacity of the state to finance the war effort (which matters for military performance and war legitimacy) and in terms of its redistributive implications, as taxation is one of the most important tools available to the state to mitigate (or exacerbate) income and wealth inequality.

Before delving into the experience of wartimes, let us briefly discuss the channels through which inflation can affect tax systems. The effects of inflation will depend to a large extent on how sensitive different taxes are to changes in nominal prices. To this effect, we can differentiate between three types of taxes. First, taxes collected as a specific money amount, such as excises on tobacco, can be strongly affected by inflation in the absence of adjusting mechanisms, as their real value diminishes while nominal prices rise. Hence, the real tax yield decreases in the presence of inflation even without regulatory changes. By contrast, ad valorem taxes, which are calculated as a percentage of the tax base (for instance, sales taxes), are largely unaffected by inflation as tax revenue rises in line with price increases. Finally, in taxes with progressive schemes, such as the income tax, public revenue grows more than the tax base, as some taxpayers at the upper-end of a tax bracket fall into higher tax brackets due to increases in their nominal income. This phenomenon is known as "bracket creep", and it results in higher average tax rates and, consequently, higher tax yields.[iv]

Because of the combination of these different effects, inflation is expected to increase the income tax / consumption tax ratio (Nowotny, 1980), which points towards a positive impact on the overall level of progressivity. The result in terms of tax revenue over GDP will in turn depend on the extent to which the system relies on taxes with positive, null, or negative responses to inflation. Beyond these static effects, inflation will also shape the composition of public revenues through its impact on macroeconomic fundamentals. A rise in nominal prices influences the incentives to engage in economic activities and thus magnitudes like income, consumption, investment, or savings. For instance, since inflation erodes the real value of savings and renders consumption more expensive over time, consumers might decide to purchase as many goods and services as possible in the short-term and postpone savings, which would increase the relative importance of consumption taxes. The impact of these changes in the overall level of public revenue collection and tax progressivity will depend on the yield and progressivity of each type of tax.

Additionally, and especially in a situation of hyperinflation, the lag in assessing and collecting tax revenue might also erode the real value of the amount raised (Nowotny, 1980). Of course, this depends crucially on the administrative procedures in play (e.g., the extent of pay-as-you-earn schemes). In some elements of the tax system, long periods of determination of the tax base might also exacerbate the effects of inflation on the tax burden. This would be the case of taxes on capital gains (e.g., taxes on the changes in value of real estate) and profits (e.g., through insufficient depreciation allowances).

We will now concentrate on income taxes, which are affected by inflation through three channels. To begin with the most obvious one, a generalized increase in nominal incomes will affect the amount of revenue collected, as we have already discussed in the previous paragraphs. Beyond the size of the tax, inflation can also alter the level of tax progressivity, by eroding the real value of exempted thresholds, bracket limits, and deductions. The direction of this effect will depend largely on the tax scheme and the underlying income distribution. For instance, if most deductions are meant to alleviate the tax burden of high incomes (such as deductions contingent on certain types of investment), and the income tax has many brackets in the upper tail of the distribution, we would expect high income-earners to pay higher effective tax rates as the real value of allowances diminishes and their rising nominal salaries bring them to higher tax brackets. In this situation, the level of progressivity would increase as inflation kicks in (Nowotny, 1980). By contrast, in the presence of a substantial stock of tax units closely below the exemption limit, a rise in nominal incomes would bring formerly excluded tax units into the tax net, which would increase the tax burden of those in the lower end of the income distribution and wear down progressivity (all the more if deductions tend to benefit low and middle incomes). The fact that the taxpayers at the top tax bracket are not affected by bracket creep (there are no upper brackets where to land) also limits the progressive impact of inflation (Nowotny, 1980). This regressive effect of inflation is precisely what most previous empirical research has found, for instance Smith (2001) on Australia in the 1950s and 1960s, or Immervoll (2015) on Germany, the Netherlands and United Kingdom in 1998.

Finally, the combination of the size (i.e., the amount of tax revenue) and progressivity of an income tax yields its redistributive effect, which might therefore also be affected by inflation. Tax redistribution is measured as the change in inequality between before-tax and after-tax income, and it is positively related to both progressivity and size (i.e., the amount of tax revenue). A very progressive tax can be barely redistributive if its size is very limited. This can be clearly seen when looking at the origins of modern income taxes. In the United States, for instance, the tax was introduced in 1913 with a very high exemption limit (3,000$) and relatively low marginal tax rates (the maximum was set at 7%), which meant that only a very small fraction of total income was taxed. According to our estimations for 1917 (when the top marginal tax rate had already doubled), less than 1% of all tax units paid the income tax at the time, and the average effective tax rate was a meager 0.6%. Even though the level of progressivity was relatively high (above that of the post-WWII period), the tax barely had any incidence on income inequality as it only affected a tiny portion of total income (Torregrosa-Hetland and Sabaté, 2021a).

Inflation hence can affect redistribution through these two channels. The result will depend on which of them prevails, and in some cases might appear counter-intuitive at a first glance. For instance, the aforementioned study by Immervoll (2015) finds that inflation reduced income tax progressivity through bracket creep, but at the same time increased the amount of revenue that entered the income tax system (which still remained progressive after all). According to his estimations, the higher size of the tax trumped the regressive effect and increased the overall level of redistribution. Süssmuth and Wieschemeyer (2022) argue that inflation increased the redistributive effect of the tax system in United States between 1962 and 2016, which they attribute to incomplete indexation of the income tax.[v]

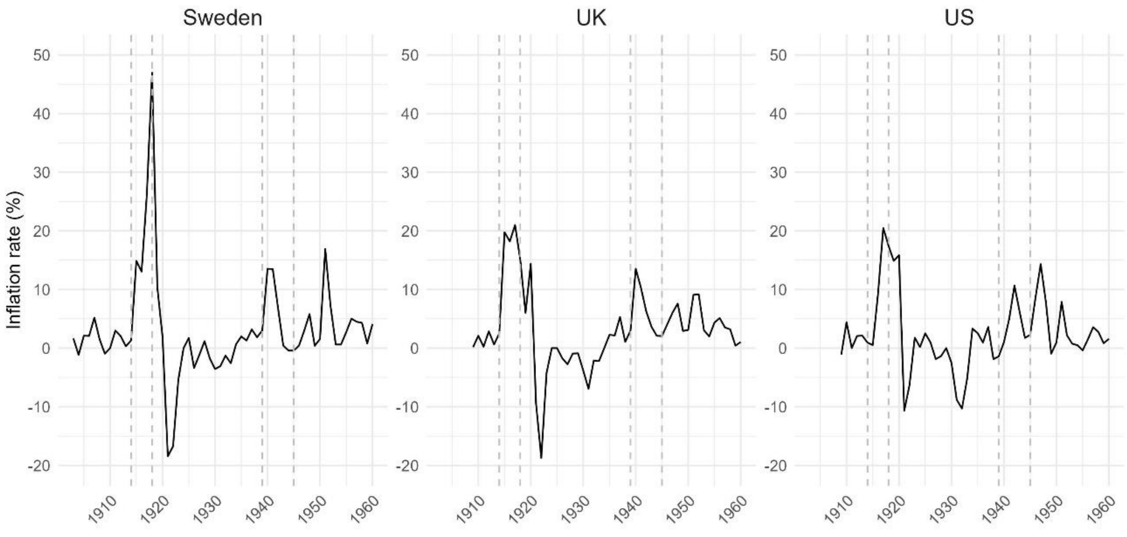
Wartime inflation and personal income taxes

The literature on the effects of inflation on taxation has mostly focused on advanced economies during the post-WWII period, so we lack a systematic body of academic work that examines this topic during wartimes. To the best of our knowledge, most of what we know is based on scattered references and qualitative assessments. For instance, Rockoff (2012) mentions that, during the Vietnam War, inflation brought US income taxpayers into higher tax brackets due to bracket creep. Similarly, Broadberry and Howlett (1998, 2005) argue that inflation expanded the income tax to lower incomes in the United Kingdom during the World Wars, while Brownlee (1996) refers to the effect of inflation in rising effective tax rates.

Inflation was indeed acute during the World Wars period, particularly during World War I, when governments were still learning how to cope with such price increases. Figure 1 shows the yearly inflation rate for three countries which we have studied in previous work: Sweden, the United Kingdom, and the United States (Torregrosa-Hetland and Sabaté, 2022). Nominal prices would have risen even more in the absence of anti-inflationary measures, such as price controls. This can be clearly seen, for instance, in the US case during World War II. When the war began in Europe, the US government tried to contain prices with appeals to cooperation from firms. In face of an initial upsurge in inflation, the administration imposed explicit price controls over certain strategic items (steel, rubber, etc.) in April 1941, only to enact general price rules on all products a year later. The final step was to freeze prices from April 1943 to April 1946. The gradual lifting of these measures in the aftermath of the conflict led to a renewed spike in prices, which in practice served as a deferred inflation tax on the holders of money and bonds (Rockoff, 2012).

In our previous study, we estimated the effect of inflation on the size, progressivity and redistributive effects of income taxes in these three countries. We did this through micro-simulation of different inflation scenarios, and comparing between them the size of the tax (i.e., number of income tax payers, tax revenue and effective tax rates) and synthetic measures of progressivity and redistribution. The calculations used original data on the distribution of taxpayers and reported income for the earliest post-war year with available data in each country. A synthetic distribution of income of all tax units was created from the original grouped data, and tax payments were imputed according to the tax regulations in place (considering the most important deductions).[vi]

Figure 1. Yearly inflation rate (1900–60)

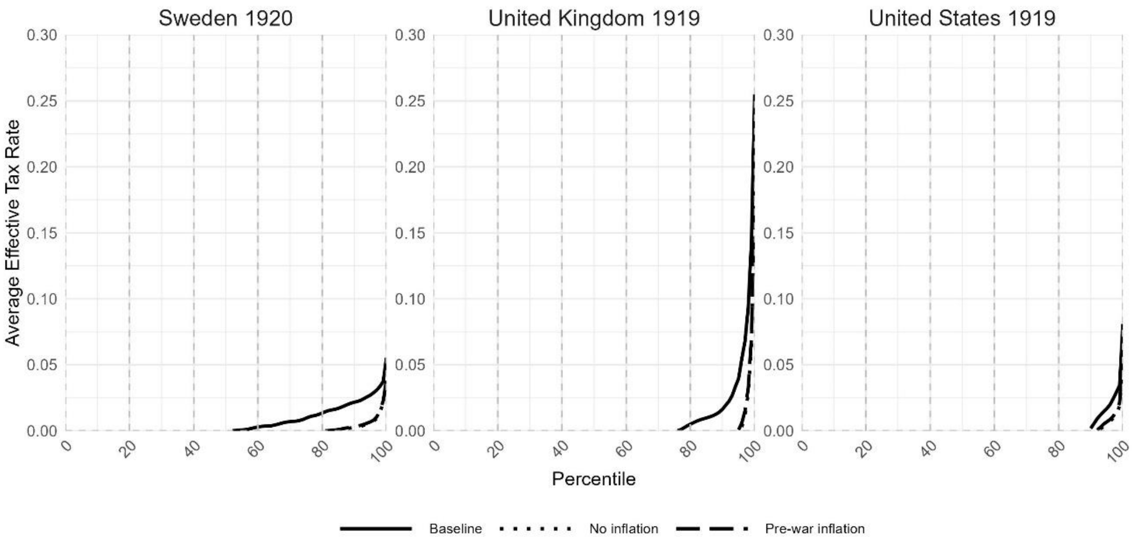


Sources: Torregrosa-Hetland and Sabaté (2022).

Note: the vertical dotted lines represent the World Wars.

Our results indicate that inflation had a significant effect on the operation of income taxes during both World Wars. On the one hand, it was a major contributor to the growth of the tax. For instance, as much as 80% of income tax revenue in Sweden in 1920 was raised by inflation (64% and 57% in the UK and US respectively, in 1919). This was the result of two combined effects. First, nearly 70% of income tax payers in Sweden (75% in the UK and 40% in the US) were brought into the tax due to the erosion of the real value of exemption limits, tax brackets and deductions. Second, high- and middle-income taxpayers were also pushed to higher income tax brackets for the same reason. Consequently, both marginal and effective tax rates would have been lower across the income distribution in the absence of extraordinary price increases, and the amount of public revenue raised by the tax would have been smaller. This can be seen in Figures 2 and 3, which show effective tax rates during the two wars in our different inflation scenarios. In all cases, effective tax rates would have been lower in the absence of inflation (scenario called “No inflation”) or in a context of pre-war inflation levels (“Pre-war inflation”) compared to the actual operation of the tax (“Baseline”). It is also evident how low- and middle-incomes would have not paid the tax without the rise in nominal incomes, especially during World War I.

Figure 2. Average effective tax rates under different inflation scenarios in the aftermath of World War I



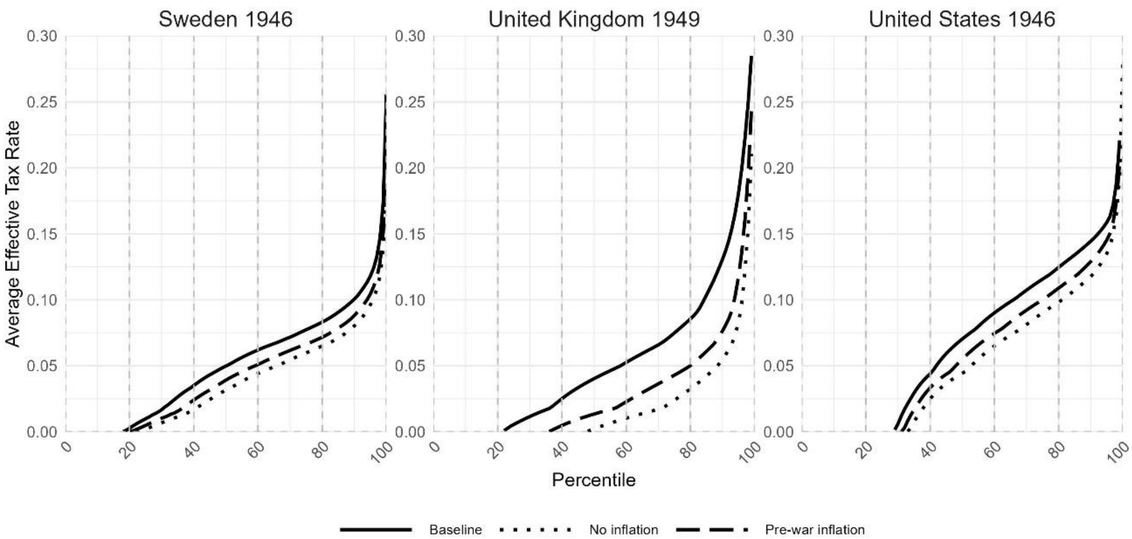
Source: Torregrosa-Hetland and Sabaté (2022).

Notes: the graphs display the average effective tax rates along the entire income distribution. The line 'baseline' shows the actual rates paid, whereas the next two lines present those estimated in the absence of inflation ('no inflation') and in a context of pre-war inflation levels ('pre-war inflation'). The two lines representing alternative inflation scenarios overlap to a large degree in the three countries.

This inflation-related expansion of the tax also affected progressivity and redistribution. On the one hand, the mentioned downward expansion made the income tax less progressive. For instance, the British tax would have been 15% more progressive during World War II without excess war inflation. However, despite the loss of progressivity, it became more redistributive due to the increased size of an overall progressive tax (in the case of the UK during World War II, around 20% of the redistributive impact of the tax was due to inflation).[vii]

Previous research shows that policymakers were aware of the fiscal causes of inflation, and this was widely debated and strongly influenced fiscal policy. But there is not much evidence to suggest that they were aware of and acted upon these effects of inflation on income taxes. To this we turn now.

Figure 3. Average effective tax rates under different inflation scenarios in the aftermath of World War II



Source: Torregrosa-Hetland and Sabaté (2022).

Notes: see Figure 2 for a description of the three different scenarios.

Inflation and taxes in the political debate

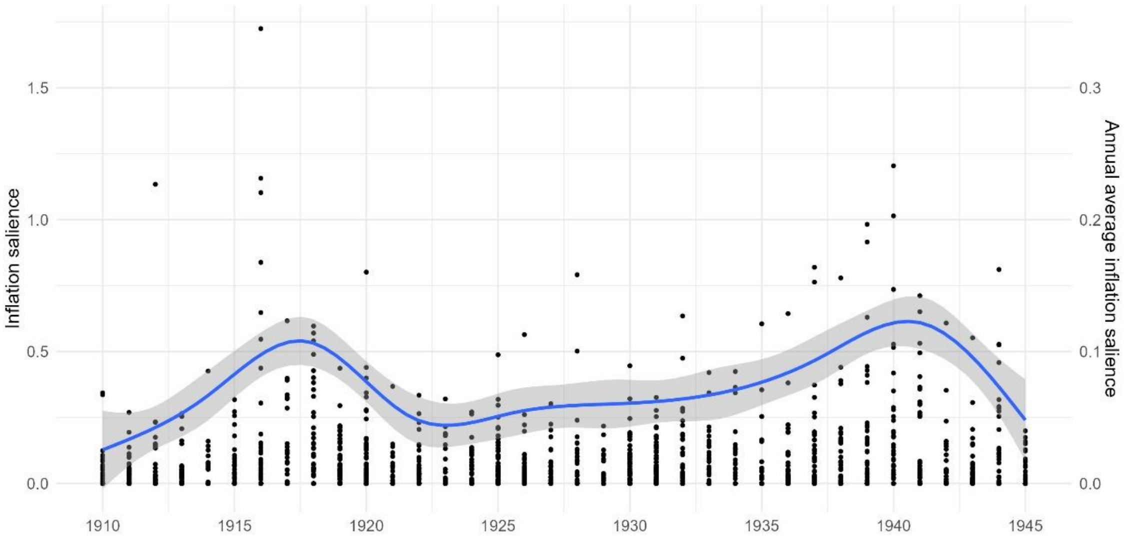
In the previous section we have seen how inflation contributed to a large extent to the downward expansion of the British income tax and increased its redistributive impact during the World Wars (although it also decreased its level of progressivity). In this section, we examine the extent to which policymakers were aware of these redistributive effects of inflation and what were their policy positions. Relying on a dataset of all parliamentary debates in the United Kingdom from 1910 to 1945 (Goenaga and Sabaté, 2020), we employ automated text analysis to revise the salience and tone of issues related to inflation in debates about the income tax. We follow a three-step procedure: first, we measure the salience of inflation and income taxes in parliamentary debates to assess the extent to which inflation was part of the discussions around income tax reform; second, we use word embedding techniques to assess the importance of redistributive concerns in these discussions; third, we identify and analyse some of the most relevant debates. In the following paragraphs we present the dataset, the methods and results of each of these three steps.

The dataset comes from Goenaga and Sabaté (2020) and contains over 1.77 million speeches by Members of Parliament (from now on, MPs) in the House of Commons and the House of Lords from 1910 to 1945. Each of these speeches is linked to a unique identifier, the date and chamber of the intervention, the name of the actor speaking, the text of the speech, the total number of words mentioned, and a battery of variables that count the number of times certain keywords appear in the text. The speeches are also grouped by debates (225,685 in total), the titles of which have been assigned by Hansard.[viii]

Salience of inflation in income tax debates

We begin by examining whether MPs were concerned about inflation when they discussed income tax reform. Our first step is to identify the salience of income taxation in the parliamentary debates. We calculate issue salience as the proportion of keywords related to a certain issue over the total number of words in a debate (see also Goenaga and Sabaté, 2020).[ix] This measure assumes that an issue is more salient when its keywords appear more often in the text. For instance, the keyword "income tax" is expected to be more frequently mentioned in debates about income taxation than in debates about other issues. As a second step, we select the debates in the top 2% of the income tax salience distribution to focus only on debates that featured income taxation prominently.[x] Finally, we measure the salience of inflation in this group of debates, which reflects the importance of this issue in debates that revolved largely around income tax reform. We restrict our initial sample to large debates (i.e., with a total number of words and interventions above the median) to avoid short interactions in Parliament.[xi]

Figure 4. Salience of inflation in large income tax debates (in %)



Notes: each dot represents a parliamentary debate (the inflation salience of which is shown in the left axis), while the blue line depicts the smoothed yearly average of the inflation salience (right axis). The two axes have different scales. We only take into account debates in the top 2% of the income tax salience distribution and with a total number of words and interventions above the median.

Sources: our own estimates based on Goenaga and Sabaté (2020).

Figure 4 presents the annual average of our inflation salience indicator. The topic was particularly salient in income tax debates during the wars, mainly in the late years of World War I and the early years of World War II. This timing is largely consistent with the evolution of price increases throughout the period. Inflation during World War I peaked in 1917 (21%), soon after the government decided to take action by imposing price caps on a wide range of consumption items (Broadberry and Howlett, 2005). The lessons of the first war spurred a more rapid reaction during World War II: as early as in mid-November 1939, Parliament passed price control legislation on clothing and household goods, which was further extended in 1941. Additional price controls on food and rents, together with subsidized foodstuff (and matched with a system of rationing that kept demand stable), were also enacted during the first years of the war and contributed to mitigate inflationary pressures (Capie and Wood, 2002). As a result, inflation was contained to moderate levels quite early in the war (below 2% after 1942) despite a two-fold increase in broad money supply (Broadberry and Howlett, 1998). Correspondingly, concern about inflationary pressures in the context of income tax debates was particularly acute during these early years.

The fact that inflation was frequently mentioned in income tax debates (particularly when price levels were higher) suggests that MPs were paying attention to the role that inflation played in the operation of income taxation. In the next subsection, we take a first look at the nature of these concerns by examining the usage of inflation-related keywords, specifically the extent to which they were related to redistributive matters. To do so, we employ word embedding.

Distributive concerns about inflation in income tax debates

Word embedding is a computational text analysis technique that aims to reveal the meaning of words by examining the properties of its context in the text. It is based on the Distributional Hypothesis in Linguistics, according to which the distribution of words nearby a given word provides substantive information about the meaning of the latter

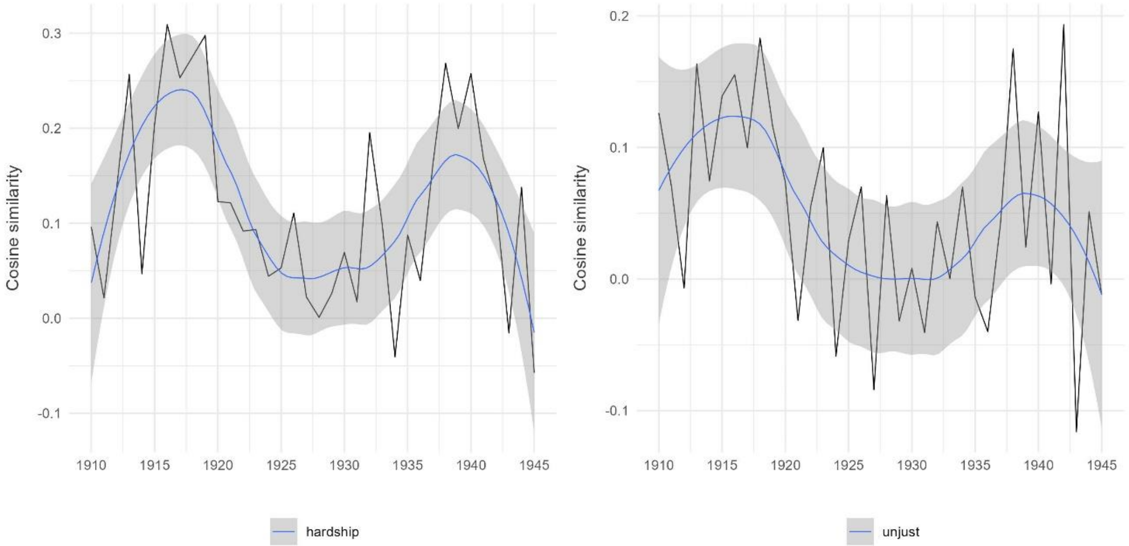
(Rodman, 2019; Rodriguez and Spirling, 2021). Beyond the study of equivalent words (two synonyms will have very similar contexts), we can apply this technique to study more subtle relationships between words that unveil biases (Garg et al., 2018), partisan differences (Rodriguez et al., 2023), or emotions (Osnabrügge et al., 2021).

In this chapter, we aim to discern whether policymakers were concerned about redistributive issues when talking about inflation. To this effect, we use word embedding to compare the context of words related to inflation with that of words related to redistributive concerns. The closer the contexts, the stronger the association between these two sets of words. This is generally measured using the cosine similarity score, which measures the similarity in the usage of words and ranges from -1 to 1 (being 1 the highest possible level). We specifically rely on the recent application developed by Rodriguez et al. (2023), which allows us to compare embedding vectors over time with a significant gain in computing efficiency.[xii]

Figure 5 shows the similarity score between the contextual information of our preferred keyword for inflation, "cost of living" (which is the most common inflation-related keyword in our corpus), and the contextual information of two keywords related to distributional concerns (also common in our corpus), "hardship" and "unjust". The level of similarity between these two sets of keywords was higher during the last years of World War I and the early years of World War II, precisely when inflation was most salient in income tax debates. This suggests that the usage of the expression "cost of living" was more influenced by perceptions of injustice during these periods than in other points in time.[xiii]

All in all, these results suggest that, first, inflation was present in income tax debates during the World Wars, particularly when price levels were at their peaks and state intervention was trying to contain the inflationary spiral. Secondly, inflation was most related to redistributive concerns precisely during these periods. In the next section we complement these findings with a qualitative analysis of the parliamentary debates, examining the type of redistributive concerns that were being voiced.

Figure 5. Cosine similarity between "cost of living" and selected keywords



Notes: Cosine similarity between "cost of living" and "hardship" (left panel) and "unjust" (right panel). Only debates in the top 2% of the income tax salience distribution.

Sources: our own estimates based on Goenaga and Sabaté (2020).

Qualitative assessment of the debates

In our last step, we identify and qualitatively analyze a sample of the income tax debates included in Figure 4. We concentrate on those that had high levels of inflation salience (i.e., that featured inflation keywords prominently) during the world wars. Specifically, we have first selected 10 debates with some of the highest levels of inflation salience for each war and then augmented this initial sample with 25 additional debates to ensure coverage of the entire war periods. For example, in World War II the initial selection concentrated on the years 1940-41 (when inflation salience was higher – see Figure 4); debates from missing years were added to make sure we would not miss important aspects about how the relation between income taxes and inflation were treated through the wars.

Based on our reading of the debates, we can draw four main conclusions. On the one hand, the debates include extensive considerations about 1) the influence of taxes on inflation (or, to be more precise, about the need to limit inflation), and 2) the influence of inflation on the income tax (implications of increased wages and the level of the exemption limits). We can also perceive very clearly the existence of different positions between the political parties when it comes to the redistributive impact of inflation (3). Finally, we will place some attention on what was said about tax morale, to see if there are signs that inflation affected negatively the legitimacy of the income tax (4).

MPs worried deeply about inflation, as it hurt the poor and infringed disruption on the economy. The trend towards price increases was presented in the debates as the result of *both* war dislocation and economic management. That is, it was generally acknowledged that an excess of public spending over revenue, bridged by borrowing, would drive up inflation. The fact that the initial war budgets were indecisive and featured an excessive potential "gap" (deficit) featured prominently in the 1940 debates, with frequent mentions to Keynes. Both chambers criticized this, for example in the words of Lord Arnold on 21 August 1940 in the Chamber of Lords:

> "How does the gap arise? It arises, of course, because of the difference in total expenditure in the current year and the total amount which the Government are likely to have at their disposal. […] The question is, how is the gap going to be bridged? I think that is a point on which we are entitled

to some information from the Government. Unless something substantial is done by increasing taxation and decreasing consumption—and the latter would mean that more money would be diverted into savings—it is difficult to see how the Chancellor of the Exchequer can balance his accounts except by inflation" (Hansard, 1940a, column 333).

During World War II, the MPs could draw from the experience of the previous war, and often urged to avoid the mistakes made in the past (the explosive inflation and also the deflationary post-war period); some examples are the speeches of Conservative MP Pierse Loftus on 9 April 1941, and of Labour MP Frederick Pethick-Lawrence on 22 May of the same year, who complained about the government's tardiness in implementing wartime tax reforms. The general position was that a vigorous increase in tax revenue was to be obtained as soon as practicable, and that taxation should be also used as a means to reduce the purchasing power of the population (through both direct and indirect taxes). As the Chancellor of the Exchequer, Kingsley Wood, put it on 22 May 1941, "the function of taxation in war-time is not merely to defray from revenue as much as possible of the current expenditure of the Government but to check the development of an excess of purchasing power over the available supply of goods and services" (Hansard, 1941a, column 1607). These arguments had also been made during World War I, even though concerns about the inflationary pressures of fiscal policies were most prominent in the latest years of the conflict. For instance, Liberal MP Thomas Whittaker urged on 1 May 1919 that "as soon as possible we ought to stop borrowing for current expenditure. Borrowing for current expenditure means inflation, and all the evils that follow from it" (Hansard, 1919, column 423).

The impact of inflation on the income tax was also in the minds of the MPs. However, the effects of inflation on tax revenue and progressivity that we have exposed previously (Torregrosa-Hetland and Sabaté, 2022) were *not* discussed directly in a formal manner. That is, we have not found references to the fact that inflation would make the tax less progressive by contributing to the incorporation of new low- and middle-income taxpayers, or that bracket creep would drive increases in income tax revenue (let alone that redistribution through the tax would increase nonetheless). In fact, there is rarely any use of the idea of real incomes. When MPs used quantitative information in their argumentation, be it aggregate quantities or examples of tax due at given levels of income, they usually did it without consideration of the different value of these quantities through time. For example, Labour MP George Benson argued that the 1940 income tax was insufficient by comparing the tax due paid with that of the year 1916: "The same man whom the Chancellor now proposes to tax £15 16s. 8d. would have paid £25 in 1915 and £31 10s., exactly double the Chancellor's present taxation, away back in 1916. What is the use of pretending that our taxation is reasonable when, at the £400 level, which is by no means near the poverty level, the taxation to-day is only half of what it was in 1916?" (Hansard, 1940b, column 112).[xiv]

References to the impact of inflation on the income tax were generally confined to the difficulties in making ends meet. An example of this can be found in the argumentation of Conservative MP John James Craik Henderson on 9 April 1941. When discussing the income tax, Henderson assumed a worker with double his (nominal) income would be spending the same amount as before the war: "Take the case of a man with two children and a pre-war wage of £3 whose wage to-day is £8. If we assume no change in his standard of living he will have an expenditure to meet of under £4 and is left with a surplus of £4", but he very soon acknowledged the impact of an increased cost of living when referring to the man whose income had not increased: “On the other hand, a man with two children, whose income before the war was £8 a week and who now finds himself with this additional taxation, is placed under a severe burden because he has the increased cost of living and the new taxation to meet” (Hansard, 1941b, column 1629). These examples show how the idea of the real value of income was not generally used, but cost of living arguments were made when they were in the interest of the speaker.

Interestingly, by the end of World War I we do find a few debates in which the concept of real incomes enters the discussion, even though they remain devoid of any explicit references to bracket creep. This can be clearly seen in the debates of 1918 and 1919 to increase exemption limits and abatements. For instance, in the context of the discussion of the financial statement submitted to the House of Commons by the Chancellor of Exchequer Bonar Law on 22 April 1918, the Labour MP James Henry Thomas argued that the exemption limit in force at that time, £130, was “equivalent” to only £65 in pre-war prices, and hence had to be restored to its previous level (Hansard, 1918a, column 729). Liberal MP Charles Seely made an even clearer use of real values when he supported a motion introduced by Labour MP William Adamson on 4 June 1918 to restore the exemption limit to the pre-war level. After the Labour MP contended that the increasing cost of living put a serious strain on low-income taxpayers to make ends meet, Seely noticed that “the old £160 which is proposed in this Clause is really now only the equivalent of the £120 to which it was reduced when the reduction was made” (Hansard, 1918b, column 1512).[xv] This line of argumentation became generalized in the analogous debates that took place in May and July 1919, when comparisons of the real value of exemptions before and after the war were commonplace.

Hence, even if MPs did not consistently use modern arguments when expressing their concerns about inflationary pressures, they were clearly not unaware of some of its effects on the tax. This played a relevant role in the efforts by many MPs to roll back wartime tax reforms in the post-war periods. The exemption threshold (and, in World War II, deductions for spouse and children) were reduced during the two conflicts to obtain additional tax revenue. However, the difficulties that people were facing to pay the income tax, precisely because of the acute increases in the cost of living, ultimately resulted in the readjustment to higher levels in the immediate postwar.

This brings us to our third conclusion, namely that redistributive concerns varied significantly across parties in both episodes. The arguments put forward by the Conservatives on one hand, and by Labour and, to a lesser extent, Liberal MPs on the other, are in line with what we would expect. Conservatives often depicted the tax burden at the top as unbearably high (referring to both the income tax and the excess profits tax). The levels which it had attained were putting a great strain on the upper class, and would negatively affect the needed investments for post-war reconstruction. MP Maurice Hely-Hutchinson claimed on 8 April 1941 to represent the general feeling of surtax payers when exposing, as he had also done in press: “After I have paid my taxes and the money I have promised, under contract, to pay for the education of my children, insurance for my wife and children after I die, rent, rates and maintenance of the London house I cannot live in, and my political expenses, I am left with about £1 a week a head for each of the persons dependent on me.” He made the argument that these surtax payers “carry considerable responsibilities” in social and economic life, and that high levels of taxation would oblige them to stop honoring them: “What ways are there in which a man in that position can deal with the situation? He can repudiate some of his contracts. If he does that, his honour is involved. […] Secondly, he can sell some of the savings put aside for his wife and children. We have to make the assumption that he has such savings; he may not have them." (Hansard, 1941c, columns 1464 and 1465).

Additionally, it was argued that taxation on the rich was not enough to win the war: an increased contribution from the lower classes was also necessary. This need for increased taxation at the bottom was recognized by MPs on the left as well. Labour supported the increase in direct taxation, which was seen as a better means for funding the state than indirect taxes (which were also raised during the wars). Frederick Pethick-Lawrence said on 8 April 1941 that "it is true that if the Chancellor wants to get the purchasing power for the prosecution of the war, he has to go to where purchasing power exists. Taking it in the broad, he has to go to the large bulk of the receivers of income if he wants to find enough purchasing power to meet his case"(Hansard, 1941c, column 1445). George Schuster from the Liberal National Party held a similar position:

> "when we turn to consider the results, the fact is that, however heavy the burden which is put on the higher classes of the community, they cannot really make a serious contribution to raising the revenue which is needed. […] If the total incomes of everyone in excess of £2,000 a year were confiscated, that would only produce something like £70,000,000 a year. A large sum perhaps, but nothing in relation to the scale of our total requirements" (Hansard, 1941c, column 1486).

Conservatives argued that the working class should pay a higher tax not just because it was necessary to win the war, but also because it was fair. On the one hand, the argument went that the working class was enjoying higher wages. MP Frederick George Banbury expressed on 22 April 1918 that "The working classes are in a far better position now than before the War", because of "the enormous increases in wages that have been given" (Hansard, 1918a, column 735). The same perception was expressed on 6 August 1940 by Craik Henderson: "A great many workmen have not got increased wages, or only small increases of wages, but in many cases wages have considerably increased" (Hansard, 1940b, column 108). Others, such as Liberal MP Thomas Whittaker went further by contending that "The working class income has doubled, but the people above the £8,000 a year income have not got this advantage," and that after discounting the payment of what he considered voluntary taxes (mainly on tobacco and alcohol), and considering the subsidy on bread, "the working-man who does not pay Income Tax does not pay any taxation at all"; in fact, he concluded, "One result of the War has been a great redistribution of wealth. It is a redistribution that you could not in ordinary circumstances have brought about in a couple of generations. The holders of invested capital have suffered very heavily indeed, while the working people have gained enormously" (Hansard, 1919a, column 430).

Indeed, during World War II, the conservative side took this idea further and argued repeatedly for the introduction of an "excess income tax", which would mirror the excess profits tax. Companies were made to pay taxes on their excess profit, defined as a difference with respect to a normal, pre-war situation.[xvi] The purpose behind this tax was not only to obtain revenue, but also to oppose war profiteering. Similarly, it was argued that workers who had seen their wages increase (mostly, in war-related industries) should also pay taxes on the difference. They had been made better-off by the war and this should be avoided. This proposal, however, clearly violated the principle of horizontal equity, and was not taken up by the government.

On the other side of the political spectrum, Labour MPs used arguments of equality of sacrifice and ability to pay to argue for steeply progressive schemes (in addition to a capital levy). MP George Benson put it forward with the following words: "One thing is quite certain, that the burdens and the sacrifices imposed by total war are so great that they will not be borne unless they are borne with a great degree of equality, a far greater degree of equality than the burdens borne before the war" (Hansard, 1941d, column 1284). According to him, there was no equality of sacrifice, because, despite the considerable graduation in income tax rates, the rich kept being able to live in luxury. Similarly, Labour MPs during the late years of World War I reminded their peers of the unjust burden that, in their view, the income tax was imposing on low-income earners. This was clearly worded by MP Clynes when defending a motion to increase exemption limits, as he argued it was "unfair and unreasonable to tax any class which is limited to an income affording only the bare necessities of existence" (Hansard, 1919b, column 1173).

Lastly, we turn to the relationship between inflation and tax morale. Tax morale is normally defined as the intrinsic motivation to pay tax, independently of coercion. According to Levi (1988), this willingness to pay can arise as part of a fiscal contract, where the taxpayers believe there is a fair exchange between their efforts, those of their fellow citizens, and the government. Because wars would promote social identification, tax morale has been found to be positively affected by wars (Feldman and Slemrod, 2009). Inflation, however, could negatively affect tax morale, both through economic hardship and by making the income tax system less progressive (even though this last impact, as we have seen, was hardly acknowledged).

In the modern literature, tax morale has been measured with individual survey responses to questions about whether it can sometimes be justifiable to evade taxes. Using these, some studies have shown a negative correlation between inflation rates and tax morale in recent decades (Martínez-Vázquez and Torgler, 2009; Doerrenberg and Peichl, 2013).[xvii] Here, we approach the issue with the parliamentary debates. What was said about tax morale in Parliament? Were there changes during the wars? Are there indications that inflation had any role in it?

The high willingness of the Brisith public to pay taxes for the war was brought up by several speeches. Early in World War II, this idea was used both to criticize the insufficiency of the 1940 budget measures and to congratulate the Chancellor of the Exchequer on the increase in tax revenue for 1941. Labour MP George Benson expressed on 6 August 1940 that: “People were expecting really heavy taxation. They were expecting very heavy burdens to be placed upon them. They were expecting it, not with fear but with the realisation that it was the only sound method of financing the war. The country was ready for the taxation” (Hansard, 1940b, column 115). On 8 April 1941, the appreciation of Pethick-Lawrence was that the extension of the income tax, even though it would be hard to pay for some, “especially by those in the lower ranges of income”, would be met with acceptance: “The Chancellor is, in effect, saying to the people, ‘I am asking you to give until it hurts’, but I believe there will be a response of which this country can be proud” (Hansard, 1941c, columns 1443 and 1444). This attitude was shared by the Liberal Henry Graham-White: “The country will, I believe, stand up to any burden that it is asked to face, provided it is satisfied that the maximum effort is being made and that the burdens are being distributed equitably and justly” (Hansard, 1941, columns 1455 and 1456). The Financial Secretary to the Treasury, Conservative Harry Crookshank, stated similarly in the summer of 1941 that “The most striking thing, though, of course, one would have expected it, is that one has not heard a single criticism of the heavy weight of taxation” (Hansard, 1941d, column 1282).

Some years later, however, references were made to a not-so-high tax morale. The extension of income tax to the working class led to difficulties, particularly with respect to weekly or monthly variation in earnings, which withholding of the tax at source was not properly adjusted for. During 1943, several MPs from both sides of the political spectrum voiced complaints about this. According to John Wilmot (Labour), “Men feel a sense of injustice at having to pay a big tax out of a small wage” (Hansard, 1943, column 1304), and MPs worried about industrial unrest. In fact, taxes were withheld at source based on the earnings from the previous year, which according to Conservative MP Oscar Guest “It is hard on all classes of the community [to be taxed on assessments for the previous year], but it is, of course, much harder on those who are not so well off” and would be very unsettling in a post-war adjustment context. He therefore continued: “The classes which have accepted direct taxation have accepted it willingly, and I hope the Chancellor will make an early effort to see whether this taxation cannot be on the wage packet as it is received and adjustments made afterwards” (Hansard, 1943, columns 1279 and 1280). At this point, the British government was studying the possible implementation of a pay-as-you-earn scheme, which was finally introduced in 1944 (Sabine, 1966, p. 201 ff.) and which can therefore be related to the need to improve income tax legitimacy.

Insights from The Economist’s opinion section

In this final section we examine the editorials and letters to the editor of the British newspaper The Economist that featured our fiscal and inflation-related keywords in their texts during the World Wars. In total we have identified 21 editorials and 17 letters to the editor during World War I, and 40 editorials and 4 letters during World War II. Both editorials and letters allude repeatedly to the same topics that were discussed in Parliament, particularly the need to finance the war through taxation to avoid inflationary pressures and the unequal effects of inflation, with some vague references to tax legitimacy.

Regarding the former, the editors of The Economist were very active advocates of the need to increase taxes (particularly income and excess profits taxes) and contain inflation. This was their editorial line throughout wartimes, albeit knowing that it was not always a popular policy among their readers.[xviii] Even at the end of World War I (10 August 1918), after the unprecedented tax increases that had been implemented during the previous years, the editors complained that “Even now we are only raising 842 millions by revenue, against 200 before the war. When we remember that, largely thanks to our Government's inflationary finance, the general level of prices has been more than doubled, it follows that we are only handing over to Government for taxes and State services rather more than twice the amount of actual buying power that we paid it before the war”, to conclude that “much more might be done by an income-tax properly devised to put the weight on the right shoulders” (The Economist, 1918a). It was with this in mind that the editorials in the early months of World War II (for instance, 6 January 1940) urged “the community” to come to terms with the need of “increasing its burden of taxes”, as it was “surely the lesson to be drawn from the financial and social history of the last war and its aftermath that the inevitable degree of inflation should be kept as small as is humanly possible” (The Economist, 1940a).

The importance of financing the war through taxation and of preventing inflation was justified in similar ways to what we have seen in the previous section. On the one hand, taxes were simply necessary to meet the war needs, as the editors made clear on the eve of World War II (13 May 1939), when they argued that “Great Britain's strength in war depends on the fact that we can, if need be, devote a higher proportion of our national income to the waging of war than any other European nation” (The Economist, 1939a). To this effect, private and public consumption had to be readjusted and diverted to military expenditure, as the editors put blatantly already on 9 December 1916, when arguing that “every reduction that can be made in our present rate of luxurious extravagance sets free men and women to work for the war” (The Economist, 1916). Taxation was deemed the best financial tool to do so, as clearly illustrated by the editorial of 5 May 1917, when the editors concluded in a rather blunt manner that “Extravagance and inflation are the two evils from which our economic health now suffers” and that “For those evils the cure is taxation, or compulsory borrowing, which alone can take out of the hands of thoughtless and ignorant people the power to warp our economic energy from the war work on which it ought to be concentrated” (The Economist, 1917).

Higher taxation was also defended on the grounds of the unequal effects of inflation and the economic imbalances that it entailed. Examples of this line of reasoning are numerous. In the aforementioned piece of 13 May 1939, the editors conceded that inflation was one of the options to finance the war and limit consumption, but this was deemed as “indirect, inefficient and grossly inequitable”, and taxes were preferred (not only to inflation, but also to loans) because “they do not leave behind them the onerous legacy of a vastly inflated national debt. Indeed, the higher taxes are during the war the less high will they need to be after the war is over.” A few months later (13 January 1940) they summarized their position in the following words:

> “By one means or another the State is going to lay its hands on half, or more, of the resources of goods and labour annually available to the British

> public. It will do this by taxation, by borrowing the savings of the people or by driving up prices through inflationary methods. The choice of method or the precise degree in which the three methods are combined will make no difference to the volume of goods and labour absorbed by the Government or to the dimensions of the public's sacrifice. The only thing that financial policy can do is to distribute the burden equitably and limit the social disturbance that its imposition involves. There is almost universal agreement that equity is at a minimum and disturbance at a maximum if the inflationary method is chosen" (The Economist, 1940b).

Important to our purposes, the editorials were quite aware of the effects that inflation had on war legitimacy, but we have not found explicit references to its impact on tax legitimacy in particular. Issues related to willingness to pay were generally brought in by the editors simply to argue that the British population was ready to bear the cost of taxation. For instance, on 27 April 27 1940 they criticized the budget introduced by the Chancellor of the Exchequer John Simon on the basis that it was a missed opportunity to implement a more resolute tax proposal that would have been "an instrument by which the people could demonstrate their passionate desire to serve the State" (The Economist, 1940c). Similarly, on 4 January 1941, the editorial speaks in favor of strong tax increases and contends that failure to do so "cannot have been fear of frightening the public, since in financial as in other matters the public has clamoured from the start to be told the worst and to be given its burdens to bear." Nevertheless, they acknowledge that "The man in the street knows that taxes hurt, and that fact limits the possibilities of what can be done" (The Economist, 1941). In this regard, some editorials emphasized the need to design tax policies that were perceived as fair in the eyes of the population. For example, the editorial on 14 January 1940 proposes to increase the tax burden on the middle class while it emphatically defends the fairness of their tax proposals and states that “it is essential that they should be seen to form part of an equitable whole” (The Economist, 1940b). The editors warned against insensitive tax reforms: simply raising the standard rate “would be interpreted as a piece of fiscal terrorism,” even though it was actually only paid by a minority; reforms therefore needed to be both cautious and more profound (The Economist, 1940d).

Finally, and consistent with our previous findings, no references have been found about the interplay between inflation, bracket creep and tax legitimacy. The closer to the issue of inflation and redistribution of the tax burden across different levels of income emerges in a commentary on the parliamentary debates of early-June 1918 (mentioned in the previous section) around the need to restore the exemption limit to the pre-war level (The Economist, 1918b). However, the editorial merely reports on the argument put forward by Labor MP William Adamson, who pointed out that those citizens that were brought into the income tax system as a result of the lowering of the exemption limit were facing a higher tax burden than before the war due to the increased cost of living.

The letters to the editor that we have revised align with the policy orientations outlined above, with some of them explicitly supporting higher taxation (particularly on middle incomes) and a firm policy to cut down private purchasing power to free resources for the war. In one of the clearest examples of such alignment, Hugh Gaitskell, member of the Labor Party, writes on the eve of World War II that “I am in entire agreement with you that every effort must be made to avoid the financing of the war by inflation. I also agree that it should be possible to increase taxation to a far greater level than most people care at present to contemplate” (The Economist, 1939b). To the best of our knowledge, only one of these letters refers to the negative impact of inflation on tax legitimacy, as the author warns that “our revenue authorities in their methods of securing taxes ignore human nature” and that “The advance in cost of living suggests that instead of 130 per annum, 200 might be the figure at which income-tax should commence, and that would eliminate a vast army of rightly discontented taxpayers” (The Economist, 1918c).

All in all, these results suggest that at least some of the published opinion was debating and considering the role that inflation played in fiscal policies, but most attention was driven to the pernicious economic impacts of inflation rather than the role that it played in tax redistribution or legitimacy. This is coherent with our revisions of parliamentary debates, that with some notable exceptions sidelined the issue of inflation and tax redistribution. Further work could broaden the picture by incorporating sources illustrating other segments of public opinion.

Conclusions

In this chapter we review the literature on war inflation and fiscal policies, focusing on the fiscal causes of inflation and the effects that rising prices have on taxation. We pay special attention to the channels through which inflation shapes the redistributive effects of income taxes. Finally, we present novel evidence on the extent to which policymakers and the public were aware of the redistributive implications of inflation in the context of debates on income tax reform.

Overall, our study suggests that inflation has been a constant and looming presence during wartimes, with profound interrelations with fiscal policies. While the literature has stressed the fiscal causes of inflation, we argue that the effects of inflation on fiscal policies are equally important, as the results of our estimations for the World

Wars periods attest. Nevertheless, our analysis of parliamentary debates and editorials of The Economist suggest that policymakers and the public had a limited grasp of how rising prices affected tax progressivity and redistribution. While they were clearly wary of the pernicious economic consequences of uncontrolled inflation, the specific implications in terms of fiscal policies were only vaguely recognized. This leaves us with the worrisome thought that a significant phenomenon with profound economic and social repercussions remained largely unnoticed, and thus left unattended. Future research should examine whether these and other blind spots are common in other contexts and what the economic, social, and political consequences have been.

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[i] Quoted by Labor MP Adamson in the House of Commons on July 5th, 1917 (see also section 3).

[ii] Moreover, inflation might be preferred to taxation in a context of shrinking economies, as it expands the money supply and contributes to economic growth (Capella Zielinski, 2016).

[iii] Financial repression can be defined as a policy reducing the nominal interest rate on public debt below what would prevail on the free market.

[iv] Several Western countries adopted systems of income tax indexation in response to these effects during the 1970s, while others have applied discretionary measures. See OECD (1976).

[v] It is important to note that their calculations include the effects of inflation on pre-tax incomes, and thus are different from most of the other cited works.

[vi] Further details can be found in the paper and in the methodological notes (Torregrosa-Hetland and Sabaté 2021b).

[vii] In the paper we present some robustness tests and additional calculations, and show that fiscal regulation and inflation reinforced each other by reducing the value of tax thresholds and bracket limits, and increasing tax rates.

[viii] Hansard is the official record of parliamentary debates in the United Kingdom. It was first introduced in 1803, although it formally became the official report of parliament in 1909. https://hansard.parliament.uk/about

[ix] The list of income tax keywords is: "income tax", "income taxes", "income taxation", "tax on income", "taxes on income", "taxation on income", "tax on incomes", "taxes on incomes", "taxation on incomes", "duty on income", "duties on income", "duty on incomes", "duties on incomes", "excise on income", "excises on income", "excise on incomes", "excises on incomes", "levy on income", "levies on income", "levy on incomes", "levies on incomes", "impost on income", "imposts on income", "impost on incomes", "imposts on incomes", "super tax", "super taxes", "sur tax", "sur taxes", "peoples tax" and "peoples taxes".

[x] The results presented below do not differ much when using other thresholds (such as 10% or 5%), but the 2% threshold ensures that all selected debates contain a significant number of relevant keywords. We also find similar results when selecting the debates based on the titles assigned by Hansard. However, many titles are not very informative (for instance, some debates that featured prominent discussions on income taxes during World War II were simply named "Amendment of law"), so we prefer our original selection based on the income tax salience distribution.

[xi] Our conclusions hold if we consider the entire corpus of speeches.

[xii] Without delving into the details, Rodriguez et al.'s method uses a pre-existing set of embeddings (i.e., a matrix of relationships between words) to estimate the average context of the words that surround the focal word. That is to say, instead of estimating the context of our preferred keyword (for instance, "cost of living") in our corpus of text (as it is customary in these techniques), it estimates the average of the context of the words that surround "cost of living" in a larger corpus (in our case, GloVe). This measure is then multiplied by a transformation matrix (obtained from our corpus of British parliamentary debates) that downweighs common but uninformative words.

[xiii] Similar patterns emerge when using other comparable keywords such as "prejudice", "sacrifice", or "ability", but they are not found when using more neutral keywords such as "motion" or "parliament".

xiv MP George Benson was immediately corrected by Andrew MacLaren (Independent Labour Party), as he reminded the House that "The cost of living was different."

[xv] This appreciation fell actually a bit short. Using our inflation data, the real value of the abatement in 1914 prices was 92, and 104 in 1915 prices (inflation had been around 20% in 1915-17 and 15% in 1918).

xvi This tax was initially set at 60% and raised to 100% in 1940.

[xvii] Both studies used data from the World Values Survey from the 1980s and 1990s; the first for comparing across Spanish regions and the second for 19 OECD countries.

[xviii] For instance, on 1 September 1917 they acknowledged the controversial nature of their position when they concluded that "Our correspondents who have criticised our view on this important matter do not seem to us to have made any effective breach in the fortifications of our argument."