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Antonio Granese[1], Barbara Pistoresi[2], Francesco Salsano[3]

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[1] University of Modena and Reggio Emilia, Department of Economics "Marco Biagi", and RECent
Email: antonio.granese@unimore.it
[2] University of Modena and Reggio Emilia, Department of Economics "Marco Biagi", and RECent
Email: barbara.pistoresi@unimore.it
[3] University of Milan and Birkbeck Centre for Applied Macroeconomics, University of London, UK
Email: francesco.salsano@unimi.it

Post-WWII Redistribution in the US: the Role of the Boom Cycle*

Antonio Granese [1]   Barbara Pistoresi[2]   Francesco Salsano[3]

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Abstract

This paper explores the impact of wartime military spending on post-war U.S. fiscal policy, with a particular focus on the "ratchet effect" in taxes and transfers. Through econometric analysis, we investigate how changes in defense spending during and after conflicts shape long-term federal transfer and tax policies, emphasizing the asymmetric influence of economic growth cycles on defense budgets. Our findings challenge conventional perspectives, showing that economic booms reinforce the fiscal structures established in wartime, resulting in sustained increases in federal transfers and tax revenues. Conversely, during economic downturns, we observe a "reverse ratchet" effect, where increases in defense spending lead to higher transfers and decreased revenues, as fiscal resources are reallocated to stabilize household incomes.

JEL subject classification: E65, H50, H56, N12, N42.
Keywords: War, Ratchet, Defense spending, Transfers, Taxes, GDP growth.

[1]antonio.granese@unimore.it – Dipartimento di Economia "Marco Biagi" and RECent,Università degli studi di Modena e Reggio Emilia, Italy.
[2]barbara.pistoresi@unimore.it – Dipartimento di Economia "Marco Biagi" and RECent,Università degli studi di Modena e Reggio Emilia, Italy.
[3]francesco.salsano@unimi.it – Dipartimento di Scienze Giuridiche "Cesare Beccaria", Università di Milano, Italy and Birkbeck Centre for Applied Macroeconomics, University of London, UK.

1. INTRODUCTION

There are theoretical reasons to believe that war could increase the size of government. Peacock and Wiseman (1961), Bird (1972), Higgs (1987) argued that, in normal times, government spending generally rises alongside income and tax revenues. However, during major crises—such as wars, severe economic depressions, epidemics, or natural disasters—governments need to significantly increase spending, often requiring higher taxes. These extraordinary events lead to a temporary public acceptance of increased taxes and government intervention, allowing the state to expand its role. Once the crisis is over, citizens often become accustomed to the new tax levels and are reluctant to give up the public services introduced during the crisis. Consequently, government spending and tax revenue may return to their normal growth paths but from a higher baseline than before, resulting in a lasting shift from the private to the public sector. This phenomenon is commonly referred to as the "ratchet effect".

Recent empirical and theoretical research[1] has focused on the potentially long-lasting effects of wars on the composition of public spending, as these shifts can significantly influence resource allocation and therefore merit serious investigation. Ramey (2011) demonstrates that the timing and nature of government spending shocks, particularly during wartime, can profoundly impact fiscal policy structure well beyond the crisis period (see also Ramey, 2016). Beetsma et al. (2016) (BCG henceforth) provide legislative, historical, theoretical, and statistical evidence identifying substantial "upward ratchet effects" in federal transfers and tax revenues following World War II. Their primary finding is that post-war reductions in defense spending led to a larger increase in transfers (per unit change in defense share) than the initial decrease observed when defense spending rose at the start of the war. This suggests that cuts in military spending after major conflicts lead to sustained or elevated levels of federal transfers and tax revenues, creating a "one-way" increase in spending and revenue that doesn't fully revert to pre-war levels once the conflict ends.

The authors provide a political economy perspective on these findings. The outbreak and persistence of the Great Depression, combined with previous expansions of general suffrage, significantly increased the median voter's demand

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[1]See, for example Beetsma et al. (2007), O'Reilly and Powell (2015), Facchini (2018) and Aghion et al. (2019). Pistoresi et al. (2024) demonstrate how military expenditures during Italy's state-building period not only expanded fiscal capacity but also influenced redistributive policies such as education and social transfers.

for redistributive policies. However, political leaders in the U.S. Congress managed to partially limit this demand, preventing it from fully translating into active public policies. Later, World War II expanded fiscal capacity by raising tax rates and strengthening direct tax collection. Consequently, the post-war decline in defense spending created a political equilibrium where part of the "peace dividend" was oredirected toward greater redistribution, raising the baseline for social spending and tax collection.

However, understanding the relationship between military spending and redistribution requires considering how economic cycles influence military spending and overall fiscal dynamics.

Cappella Zielinski et al. (2017) examine this interplay, highlighting that economic growth and contraction have asymmetric effects on military budgets. Through a cross-national analysis of military spending since WWII, the authors show that economic downturns have a greater impact on military spending than economic growth. Economic contraction will reduce government revenues[2] leading to cuts in military budgets in favor of civilian spending. Recessions often result in increased demand for civilian programs, such as unemployment benefits, making military spending a likely target for reduction.[3]

In contrast, economic expansions do not have a correspondingly strong effect on military budgets since defense is a public good that does not require proportional increases with GDP. These insights reveal an asymmetric relationship, where GDP declines impact military budgets more significantly than GDP growth[4],potentially introducing a critical dimension missing from Beetsma et al.'s model.

In this paper, we examine whether the approach by Beetsma et al. (2016) can provide reliable estimates of the ratchet effect on transfers and taxes in the U.S. after World War II, given the asymmetric effects of economic cycles on

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[2]Mostly in the presence of a counter-cyclical tax cut to stimulate the economy.

[3]Moreover, the most frequent criticism of governments with high military spending is that deriving from the current known as military Keynesianism, according to which defense spending distracts national resources in favor of defense, neglecting other forms of social spending. Military spending is referred to as warfare State; it is easy to see the contrast with the welfare state.

[4]An earlier study by Aizenman and Glick (2006) highlighted this asymmetric relationship, showing that military spending's effect on growth is non-linear: it promotes growth under external threats but hinders it in contexts of corruption and rent-seeking. Aizenman and Glick empirically evaluated these dynamics, incorporating factors like external threats, corruption, and military spending, and explained the non-linearities through an extension of the Barro and Sala-i Martin (1995) model, where growth depends on threat severity and related military expenditure. This analysis suggests that the economic impact of military spending varies significantly with domestic political and economic conditions.

military spending identified by Cappella Zielinski et al. (2017) Our objective is to test the robustness of Beetsma et al.'s findings by exploring whether the ratchet effect holds when we consider these cyclical asymmetries. Specifically, if we incorporate the effects of economic cycles into the framework, does the upward ratchet in defense spending's impact on transfers and taxes still apply?

In BCG, the relationship between the business cycle and military spending is controlled for but not explored in terms of its asymmetrical effects on defense expenditures. Econometrically, we extend the framework of BCG by introducing non-linear relationships between defense spending and economic growth. Specifically, we introduce interactions between past business cycles and changes in defense spending—both positive and negative—to assess potential asymmetries during periods of economic expansion and contraction. This approach enables us to provide a comprehensive understanding of post-war fiscal dynamics in the U.S.

Our findings confirm the presence of an upward ratchet effect on federal transfers, as described by BCG, but reveal that this effect is deeply influenced by economic conditions. During economic booms, reductions in defense spending lead to sustained increases in federal transfers and revenues, amplifying the upward ratchet effect. Conversely, in economic downturns, we observe a reverse ratchet: increases in defense spending are associated with rises in transfers and declines in revenues, as fiscal resources shift to support household incomes under economic strain. This reverse ratchet suggests that in recessions, transfers do not decline in line with reduced fiscal capacity; instead, they play a crucial stabilizing role. Thus, economic cycles significantly shape the ratchet effect on transfers.

As a result, our study extends the picture provided by BCG. By accounting for the asymmetric impact of economic cycles on military spending, our approach reveals how economic downturns intensify the stabilizing role of transfers when defense spending rises, while economic booms enhance the upward ratchet effect following reductions in defense spending. This nuanced perspective provides a more comprehensive understanding of post-war fiscal policy dynamics, capturing both the upward and reverse ratchet effects that shape long-term federal spending patterns.

The rest of the paper is structured as follows: Section 2 presents the stylized facts, Section 3 outlines the econometric framework and data, while Section 4 discusses the empirical results. Finally, Section 5 concludes the study.

2. Stylized Facts

The U.S. economy underwent profound transformations during the 20th century, driven largely by wartime events, business cycles, and fiscal policies. Figure 1 highlights some of these dynamics, using time series from the dataset employed by BCG,[5] that analyze the fiscal and economic impact of government interventions during periods of war, focusing on the ratchet effect in defense spending.

(a) Real GDP growth per capita
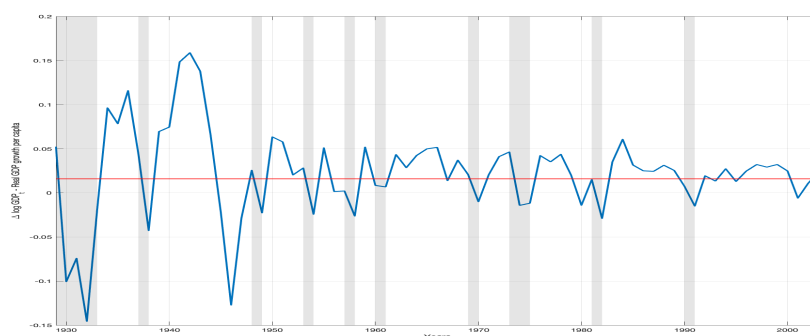
(b) GDP shares of federal transfer, defense spending, taxes and revenue
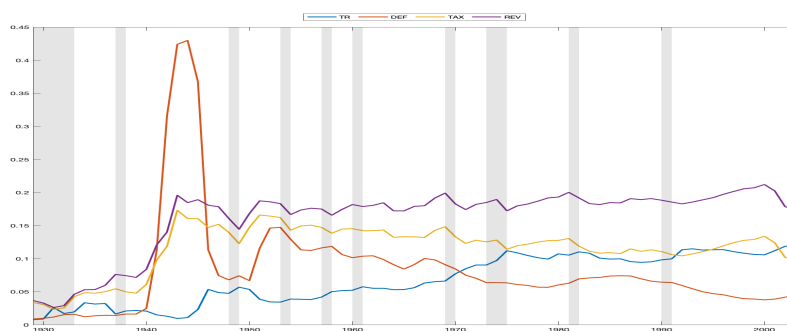
Figure 1: Panel (a) shows the per capita real GDP growth from 1928 to 2005. The red line represents the threshold of 0.0158, as specified in the analysis, which distinguishes periods of economic expansion and contraction. Gray shaded areas indicate recession periods as designated by the NBER. Panel (b) displays the GDP shares of federal transfer spending, defense spending, tax revenues, and total federal revenues over the same period.

The top panel of the figure shows per capita real GDP growth from 1930 to 2005, alongside recessions designated by the NBER[6] The bottom panel depicts

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changes in defense spending, household transfers, and tax revenue as percentages of GDP. Recessions are indicated by gray vertical bands in both panels.

In 1931, during the Great Depression, the economy was in severe distress. New Deal policies introduced the first state transfers to households, but these measures were insufficient to ensure sustained recovery. Transfers remained limited at 2.61% of GDP, while tax revenues accounted for about 2.35% of GDP, highlighting the government's limited capacity to intervene on a large scale. During this period, the recession from 1937 to 1938 further deepened the economic crisis, lasting from May 1937 to June 1938. This recessionary cycle underscored the persistent economic fragilities despite New Deal efforts. Although fiscal policies contributed to the recovery, a combination of economic factors and political decisions led to a renewed downturn. Monetary policy, in particular, played a crucial role during this recession. The Federal Reserve, fearing inflation, decided to increase reserve requirements for banks in 1936 and 1937. This monetary tightening reduced the amount of money available for lending, slowing growth and exacerbating the recession.

With the U.S. entry into World War II, defense spending skyrocketed, rising from 11.3% of GDP in 1941 to 43% in 1944. This unprecedented increase in defense spending marked a turning point in the country's economic mobilization, acting as a catalyst for economic expansion and helping to overcome the challenges of the Great Depression. Milward (1979) observes that the U.S. economy transformed into a "war machine", with industrial production driving economic expansion. This period saw significant advancements in the aerospace industry, communications, and mass production, which continued to shape the American economy in the postwar era. The war also led to a sharp decline in unemployment, as millions of Americans found employment in arms factories, further accelerating GDP growth. At the same time, civilian spending gradually decreased, dropping from 3.94% of GDP in 1940 to 1.09% in 1944, as public resources were almost entirely allocated in the war effort. Transfers to households also remained relatively low as a percentage of GDP during the war, accounting for about 1.09% in 1944. To finance this massive effort, tax revenues increased dramatically. The Revenue Act of 1942, which significantly expanded the tax base, pushed tax revenues from 9.79% of GDP in 1941 to 17.3% in 1943. Total government revenues reached 19.6% of GDP in 1943, supported by both higher

stlouisfed.org/series/USRECD), they largely correspond to ours, which are derived through a dummy variable. This supports the idea that our data can capture a recession where one is actually occurring.

taxes and the issuance of War Bonds, which allowed the government to raise funds with less impact on public debt costs. During this period, U.S. public debt grew significantly, from about $45 billion in 1940 to approximately $258 billion in 1946. This debt growth was primarily driven by the need to finance the war effort, and although it represented a burden on future public finances, the rapid increase in economic activity during and after the war helped make the debt sustainable in the long term.

After the war, in 1946, transfers to households rose significantly, reaching 5.35% of GDP, supported by programs like the G.I. Bill, which provided support to war veterans, helping to stabilize consumption and sustaining domestic demand. Tax revenues also remained high, around 14.7% of GDP in 1946, due to tax reforms and the expansion of the tax base.

In the aftermath of World War II, a recession occurred in 1945, beginning in February and ending in May. This brief recessionary period was marked by a rapid economic contraction as the country transitioned from a wartime to a peacetime economy. However, postwar recessions were brief, thanks to an economic recovery driven by reconstruction and public investment. The 1948-49 recession marked a significant slowdown, as the U.S. economy experienced contraction despite continued growth in defense spending and transfers reaching 5.69% of GDP in 1949. This increase reflected a strategic government response aimed at mitigating the effect of the downturn, supporting household income and maintaining a certain level of social stability. The 1953 recession, though more moderate, signaled the U.S. economy's transition from a period of high defense spending to a phase of stabilization and growth. During this recession, transfers to households remained relatively stable at 3.43% of GDP, while tax revenues accounted for 16.2% of GDP. This highlights the government's commitment to providing essential support to households, helping to sustain purchasing power and stabilize the economy during uncertain times.

The economic expansion of the 1950s was sustained by continued defense spending, with the Korean War helping to keep demand high. Defense spending reached 39.3% of GDP in 1951, reflecting the persistence of a wartime economy even in peacetime. By 1955, at the end of the Korean War, transfers represented about 3.86% of GDP, signaling the emergence of a more robust welfare system. The 1957-58 recession marked another critical moment, characterized by a significant decline in industrial production and rising unemployment, due to a combination of factors, including the Federal Reserve's interest rate hikes

aimed at curbing inflation. Transfers to households helped to mitigate the impact of the recession. Despite this slowdown, the 1950s ended with a moderate recovery, thanks in part to the growing role of the state in supporting consumption through social policies. This phase marked the beginning of a period in which public intervention in the economy became increasingly relevant, setting the stage for the economic transformations of the 1960s.

The 1960-1961 recession marked a brief but significant economic slowdown, characterized by a decline in industrial production and rising unemployment. Although the economy recovered relatively quickly, this period underscored the need for more robust state intervention to stabilize the economic cycle. It was in this context that, during the 1960s and with the expansion of the Great Society's social policies, transfers continued to grow, reaching about 5.2% of GDP by 1965.

During the Vietnam War, military spending remained high, reaching 9% of GDP in 1969, while transfers and tax revenues continued to expand. However, the tension between defense and welfare needs began to create pressures on public budgets. In the 1970s, with rising inflation and economic stagnation, the phenomenon of stagflation posed new challenges. The recessions of 1970 and 1973-75 marked a slowdown in growth, while the costs of war and social spending continued to exert pressure on the public budget.

The U.S. has experienced numerous recessions and boom, as shown in Figure 1, underscoring the importance of modelling the ratchet effect on the defense spending, including economic states. Specifically, BCG analyse the ratchet effect in defense spending, but their analysis does not consider the economic states that are highly relevant in other periods, such as peacetime recessions or post-war recoveries.

3. Econometric Approach and data

Coming to the empirical application, we use a similar econometric framework and the same dataset provided by BCG. However, to econometrically model the link between defense spending and the business cycle, including the possibility that the ratchet effect may manifest differently during periods of recession and expansion, we introduce non-linear relationships between defense spending and economic growth. To this aim we will interact a dummy variable indicating whether the lagged economic growth was more or less than 1.58 percent (on

annual basis)[7] with two variables: one representing the positive changes in defense expenditures and the other capturing the negative changes, as outlined by BCG. Positive and negative changes in defense represent proxies for periods of military investment during wars or international tensions, and for reductions or disinvestment in military spending during post-war periods or times of peace, respectively.

The regressions are done for annual variables expressed as shares of GDP. Estimation is by OLS with a Newey-West correction for heteroskedasticity and serial correlation. All regressions are based on an AR(1) error structure[8]. The basic model is thus:

$$
\begin{aligned}
\Delta Y_t = \beta_0 &+ \beta_1 \Delta DEF_{Ut} + \beta_2 \Delta DEF_{Dt} + \beta_3 BOOM \\
&+ \beta_4 (BOOM \times \Delta DEF_{Ut}) + \beta_5 (BOOM \times \Delta DEF_{Dt}) \\
&+ \beta_6 \Delta POP65_{t-1} + \beta_7 \Delta u_{t-1} + \epsilon_t
\end{aligned} \tag{1}
$$

where Y_t represent, federal transfers, federal tax rates and federal revenues in different specifications. BOOM is a dummy variable coded 1 when the lagged difference in log of real per capita GDP, $\Delta \log GDP_{t-1}$, is greater than 0.0158, and zero otherwise. ΔDEF_{Ut} is equal to the change in the share of defense expenditures when this variable is positive and zero otherwise and ΔDEF_{Dt} is equal to the change in this share when it is negative and zero otherwise, in order to test for the possible existence of ratchets. $\Delta POP65_{t-1}$ is the share population of 65 and older, Δu_{t-1} is the lagged change in unemployment rate. These last two variables are introduced in order to control for the autonomous forces that drive the take-up of transfers.

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[7]BCG use a threshold of 0.01586 to distinguish between "growth" and "decline" in the economy. Similarly, Cappella Zielinski et al. (2017) suggest that economic decline, as it relates to military spending changes, may not begin at zero, finding significant results at a 2 percent threshold. During periods of slow economic growth, pressure to reduce military expenditures may rise due to competing demands, particularly for essential government services like education and healthcare, which grow with the population. Consequently, if GDP growth is insufficient to meet these demands, the military budget may struggle to secure a stable share of resources.

[8]Tre regressions include a constant, of which for brevity we do not report the estimate

4. Empirical Results

4.1. Transfers and Defense Spending

Table 1 presents several regression models examining the effect of changes in defense spending on changes in federal transfers, with and without controls for potential non-linear relationships between military spending and economic growth, as specified in equation (1).

	ΔTR (1)	ΔTR (2)	ΔTR (3)	ΔTR (4)	ΔTR (5)	ΔTR (6)
Period	1931-2002	1931-2002	1931-2002	1931-2002	1937-2002	1937-2002
$\Delta\mathrm{DEF}_t$	-0.076					
	(-2.76)					
$\Delta\mathrm{DEF}_{Ut}$		-0.026	0.199	0.583	0.855	0.999
		(-1.21)	(0.31)	(1.18)	(1.74)	(2.47)
$\Delta\mathrm{DEF}_{Dt}$		-0.112	-0.099	-0.110	-0.114	-0.117
		(-13.33)	(-8.23)	(-15.47)	(-13.26)	(-19.08)
$BOOM$			-0.002		-0.001	
			(-1.17)		(-0.47)	
$BOOM * \Delta\mathrm{DEF}_{Ut}$			-0.227	-0.608	-0.883	-1.025
			(-0.35)	(-1.24)	(-1.80)	(-2.52)
$BOOM * \Delta\mathrm{DEF}_{Dt}$			-0.120	-0.079	-0.090	-0.078
			(-3.00)	(-2.50)	(-2.57)	(-2.34)
$\Delta\mathrm{POP65}_{t-1}$	0.609	-0.049	-0.142	-0.155	-0.358	-0.355
	(0.52)	(-0.04)	(-0.13)	(-0.14)	(-0.29)	(-0.28)
$\Delta\mathrm{u}_{t-1}$	0.009	0.036	-0.004	0.030	-0.002	0.014
	(0.22)	(0.97)	(-0.09)	(0.81)	(-0.02)	(0.18)
R^2	0.24	0.30	0.33	0.32	0.39	0.39
$\bar{R}^2$	0.20	0.25	0.25	0.24	0.31	0.32
DW	1.89	1.91	1.93	1.92	1.81	1.81
H_0 : no ratchet		$p = 0.00$	$p = 0.65$	$p = 0.17$	$p = 0.06$	$p = 0.01$

Table 1: ΔTR= change in GDP share of transfers; $\Delta\mathrm{DEF}_U$= change in share of defense spending when change is positive and zero otherwise; $\Delta\mathrm{DEF}_D$= idem, when this is negative and zero otherwise; $BOOM$ is a dummy variable coded 1 when the difference in log of real per capita GDP is positive and zero otherwise; $\Delta\mathrm{u}(-1)$= the lagged change in unemployment rate. Numbers in parenthesis are t-statistics, DW= Durbin-Watson test statistic. The last row provides the p-value of the F-test statistic of the null hypothesis that there is no ratchet in the effect of defense expenditures on total government expenditures.

Column 1 reports the results excluding the potential ratchet effect. Defense spending has a statistically significant negative effect on transfers: as the share of defense spending in GDP increases, the share of transfers in GDP decreases.

Column 2, which takes into account the potential ratchet effect and mirrors the regression of column 1 in all other respects, shows a significantly negative coefficient on defense spending when its share declines ($\Delta\mathrm{DEF}_D$), suggesting an increase in the share of federal transfers. Conversely, there is no significant effect on the share of transfers when the share of defense spending increases ($\Delta\mathrm{DEF}_U$). The F-test rejects the hypothesis that the coefficients for increases and decreases

in the share of defense spending are equal at the 1% level, supporting the existence of a significant ratchet effect in the impact of defense spending on federal transfers. This result is consistent with the findings of Beetsma et al. (2016).

The remaining columns of Table 1 test our hypothesis regarding the non-linear relationship between military spending and economic growth. We study this by interacting positive and negative changes in the defense share with the dummy variable $BOOM$, using two interaction terms: $BOOM \times \Delta DEF_{Ut}$ and $BOOM \times \Delta DEF_{Dt}$. We present columns 3-6 for two different sub-periods (1931-2002 and 1937-2002) to test whether the existence of the ratchet effect depends on the presence of the Great Depression. In columns 3 and 4 (baseline sample 1931-2002), the ratchet effect observed in column 2 is no longer present (see the F-test in the last row of Table 1). However, in columns 5 and 6, which omit the Great Depression period (1929-1936), the ratchet effect is evident. This allows us, unlike Beetsma et al. (2016), to assert that the existence of the ratchet effect in federal transfers is closely related to World War II and not dependent on the Great Depression. The existence of the ratchet effect in federal transfers thus depends on the state of the economy and its interaction with changes in military spending.[9]

For brevity, let us focus on column 6.[10] Considering the effect of a downturn in economic growth (BOOM=0). When the defense share rises, transfers increase significantly ($\beta_1 = 0.999$); similarly, when the defense share falls, transfers still increase but to a lesser extent ($\beta_2 = -0.117$). Notably, the coefficient is approximately eight times larger in absolute value when the defense share increases compared to when it decreases. This suggests that during periods of slow economic growth linked to rising defense spending, transfers play a stronger role in supporting household incomes compared to periods of declining defense spending, likely at the end of a war. This phenomenon is referred to in the literature as the "reverse ratchet" effect.

Examine now the effect of high economic growth (BOOM=1). When the economy is booming and defense spending increases, the overall effect is negative ($\beta_1 + \beta_4 = -0.026$), whereas it becomes positive when defense spending decreases ($\beta_2 + \beta_5 = 0.195$). This reflects the upward ratchet effect highlighted by (Beetsma et al., 2016). Therefore, during periods of economic boom, the rise in the share

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[9]In Beetsma et al. (2016) when WWII and its aftermath are excluded from the sample, the ratchet effect disappears, supporting the conclusion that the ratchet in transfers is strongly related to this war. For this reason, we do not show this exercise.

[10]The results in column 5 are quite similar.

of transfers (per unit change in the share of defense spending) is greater when defense spending decreases (i.e., after the war). Therefore, the increase in the share of transfers (per unit decrease in defense spending) during post-war periods is more significant in times of economic boom than during recessions. This highlights the need to consider the interactions between past business cycles and military spending when testing the transfers ratchet effect. Consistent with Beetsma et al. (2016), the lasting impact of World War II on transfers is evident; however, this is largely attributable to the American economy's post-war boom, fueled by industrial advancements.

4.2. Defense Spending and Fiscal Revenues

Now let's approach the hypothesis of war-related ratchets on the other side of the public budget, also considering the asymmetric effect of the economic cycle on military spending. Table 2 shows the impact of defence spending on federal taxes and federal revenues, controlling (or not) for the hypothetical non-linear relationships between military spending and economic growth.

We start by replicating the empirical analysis conducted by BCG. Columns 1 and 1.a display the effect of changes in defense spending on changes in taxes and revenues, excluding the potential presence of a ratchet effect. Defense spending shows a statistically significant positive impact on taxes and revenues. Generally, as the share of defense spending in GDP rises, the share of taxes and revenues in GDP also rises. The regressions in columns 2 and 2.a allow us to distinguish the coefficient on changes in the defense share, depending on whether it increases or decreases. The results show that the impact of defense spending is both positive and significant in either case. Notably, the coefficient is at least five times larger when the defense share increases compared to when it decreases. The F-test in the last row of the table confirms that this difference is statistically significant, indicating that the observed ratchet effect is unlikely to be a statistical artifact.

The remaining regressions in Table 2 test our assumptions about the nonlinear relationships between military spending, economic growth, and their impact on taxes and revenues. Let's focus on columns 4 and 4.a in the case of an economic downturn (BOOM=0). In this scenario, both taxes and revenues decrease in response to either an increase or a decrease in military spending. However, the decrease in response to higher military spending is about six times larger, providing strong evidence—consistent with the findings on transfers—of a reverse ratchet effect. The F-test confirms that this difference is statistically significant.

During an economic slowdown, taxes and revenues decline more sharply when military spending increases. At the same time, transfers rise as the government intervenes to support household incomes. The increase in military spending is largely financed through debt issuance (Barro, 1979).

	ΔTAX	ΔTAX	ΔTAX	ΔTAX
	(1)	(2)	(3)	(4)
Period	1931-2002	1931-2002	1931-2002	1931-2002
ΔDEF$_t$	0.126			
	(2.82)			
ΔDEF$_{Ut}$		0.245	-2.162	-2.192
		(5.86)	(-2.53)	(-3.13)
ΔDEF$_{Dt}$		0.042	0.041	0.042
		(4.59)	(2.43)	(3.28)
$BOOM$			0.000	
			(0.09)	
$BOOM * \Delta$DEF$_{Ut}$			2.415	2.445
			(2.80)	(3.45)
$BOOM * \Delta$DEF$_{Dt}$			0.128	0.124
			(1.10)	(1.07)
ΔPOP65$_{t-1}$	1.624	0.110	0.256	0.257
	(0.81)	(0.06)	(0.16)	(0.16)
Δu$_{t-1}$	-0.036	0.022	0.070	0.067
	(-0.37)	(0.32)	(0.95)	(0.91)
R^2	0.24	0.37	0.43	0.43
$\bar{R}^2$	0.20	0.32	0.36	0.37
DW	1.95	1.98	2.00	2.01
H$_0$: no ratchet		$p = 0.00$	$p = 0.01$	$p = 0.00$
	ΔREV	ΔREV	ΔREV	ΔREV
	(1.a)	(2.a)	(3.a)	(4.a)
Period	1931-2002	1931-2002	1931-2002	1931-2002
ΔDEF$_t$	0.111			
	(2.68)			
ΔDEF$_{Ut}$		0.217	-1.626	-1.837
		(4.74)	(-1.61)	(-2.20)
ΔDEF$_{Dt}$		0.036	0.035	0.041
		(3.79)	(1.87)	(2.81)
$BOOM$			0.002	
			(0.51)	
$BOOM * \Delta$DEF$_{Ut}$			1.851	2.060
			(1.82)	(2.44)
$BOOM * \Delta$DEF$_{Dt}$			0.074	0.051
			(0.61)	(0.41)
ΔPOP65$_{t-1}$	2.405	1.060	1.154	1.168
	(1.18)	(0.54)	(0.64)	(0.65)
Δu$_{t-1}$	-0.074	-0.021	0.037	0.019
	(-0.70)	(-0.25)	(0.39)	(0.20)
R^2	0.22	0.31	0.35	0.35
$\bar{R}^2$	0.17	0.26	0.27	0.28
DW	1.97	1.98	2.00	2.00
H$_0$: no ratchet		$p = 0.00$	$p = 0.11$	$p = 0.03$

Table 2: ΔTAX= CHANGE IN GDP SHARE OF FEDERAL TAXES. ΔREV= CHANGE IN GDP SHARE OF FEDERAL REVENUES. FURTHER, SEE NOTES TO TABLE 1.

Let's take a look at the effect of high economic growth (BOOM=1). As previously noted, the regression shows a significantly negative coefficient for defense spending when its share increases, indicating a reduction in federal taxes and revenues. However, the coefficient for the interaction term is both statistically

significant and positive, meaning that during periods of economic boom, this interaction effect offsets the direct impact. Specifically, when the share of defense spending rises, taxes decrease ($\beta_1 = -2.192$) and revenues fall (-1.837), but this decline is reversed if the economy is booming (with values of $\beta_4 = 2.445$ for taxes and 2.060 for revenues). In fact, the absolute value of the interaction term is greater. Thus, the overall effect of increasing defense spending during economic growth (BOOM=1) is positive for both taxes and revenues (0.253 and 0.223, respectively).

On the other hand, the regression indicates a negative effect on federal taxes and revenues when the share of defense spending decreases ($\beta_2 = 0.042$ and 0.041). Furthermore, the interaction term is not statistically significant, suggesting that during periods of economic expansion, the direct effect remains unchanged. Thus, when defense spending declines, the only statistically significant impact is the direct one. In cases of economic expansion, taxes and revenues increase more significantly at the outbreak of war than they decrease at the war's conclusion. This exemplifies the ratchet effect: at the onset of war, the tax burden rises during booming periods, while it falls during economic contractions. In a growing economy, decision-makers are more inclined to raise the tax burden to support the war effort. In times of national emergency, taxpayers are generally more willing to accept higher taxes, especially when progressive tax schedules are in place.

We present an additional mechanism that BCG does not address: an upward ratchet that occurs during periods of economic growth, alongside a reverse ratchet during economic slowdowns. When we consider the relationship between the state of the economy and the defense budget, the upward ratchet is observed only when the economy is booming.

5. CONCLUSIONS

This study provides a thorough analysis of the non-linear interactions between defense spending, economic growth, and fiscal policy in the United States, from the Great Depression to the post-war era, with a particular focus on the "ratchet" effect in defense spending and its impact on federal transfers, taxes and revenues. Our empirical results provide valuable insights that extend the existing literature, placing the theoretical framework of BCG within a broader perspective that considers the economic context in which the ratchet effect occurs.

We find strong evidence of upward ratchet in federal transfers or revenues, particularly during periods of economic expansion. This asymmetry is even more pronounced when excluding the Great Depression period, suggesting that post-World War II economic dynamics played a crucial role in maintaining elevated levels of federal transfers. During periods of strong economic growth, reductions in defense spending are more likely to lead to sustained federal transfers, reinforcing the fiscal capacity built during wartime. Conversely, in recessions, we observe a reverse ratchet, where increases in defense spending are associated with both higher transfers and lower revenues, as fiscal resources are reallocated to stabilize household incomes under economic strain.

The analysis of tax revenues also reveals a ratchet effect, particularly during economic booms. Increases in military spending during growth phases are associated with significant revenue increases, as wartime fiscal measures are often maintained or expanded. However, during recessions, this pattern reverses, with increases in defense spending linked to higher transfers and lower revenues, as fiscal resources are redirected to support household incomes under economic strain, a reverse ratchet effect.

We extend the ratchet effect literature by demonstrating that economic conditions (whether expansionary or contractionary) play a decisive role in the long-term sustainability of post-crisis fiscal policies. Our findings, which depart from BCG, show that high wartime tax rates, combined with post-war economic booms, create a fiscal environment that enables elevated levels of federal transfers and revenues to persist well beyond the crisis period.

In conclusion, the evidence underscores the critical role of economic boom in shaping the enduring effects of defense spending and fiscal policy in the United States. This study emphasizes the need to consider the broader economic context when evaluating the lasting impacts of wartime fiscal measures, particularly how economic growth can enhance fiscal capacity and sustain federal transfers and revenues over time. Future research should explore these dynamics in different contexts, examining how variations in economic performance influence fiscal policies and military spending across periods.

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