
The economic consequences of the 1953 London Debt Agreement

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The London Debt Agreement (LDA) eliminated half of West Germany's external debt. Subsequent years witnessed unprecedented economic growth. The LDA likely contributed to economic growth by creating fiscal space for public investment and social spending, restoring the full convertibility of the Deutsche Mark, and stabilising inflation. The LDA was associated with a substantial and statistically significant rise in real per capita social expenditure relative to other spending categories. Synthetic control methods also show that under the counterfactual of no debt relief, overall expenditure might have been lower by 17 percent. The LDA also facilitated the reintegration of Germany into global markets and full convertibility of the Deutsche Mark by catalysing accumulation of sufficient US-Dollar reserves.

1. Introduction

In the aftermath of World War II (WW2), West Germany experienced a historically remarkable acceleration in the pace of economic growth.¹ As shown in figure 1, in 1946 Germany's gross domestic product (GDP) per capita was only 34 percent of the UK's and less than 65 percent of France's. By 1959, Germany had caught up with France and, by 1970, with the UK. This prolonged period of strong growth was not simply a short-term rebound from the wartime devastation of infrastructure and enterprise. Almost all other European nations embroiled in WW2 suffered initial economic setbacks from falling trade and damage to reproducible asset stocks, demographic catastrophe, refugee movements, and political upheaval, yet none had such a rapid and sustained growth as did West Germany (Eichengreen 1995; Vonyó 2018). This growth—the highest rate in Europe—came to be called “Wirtschaftswunder” or “The Miracle on the Rhine”, achieving a

¹ Unless otherwise stated, Germany refers to West Germany or the Federal Republic of Germany. West Germany was the territory occupied by the US, the UK, and France from 1949 until 1955.

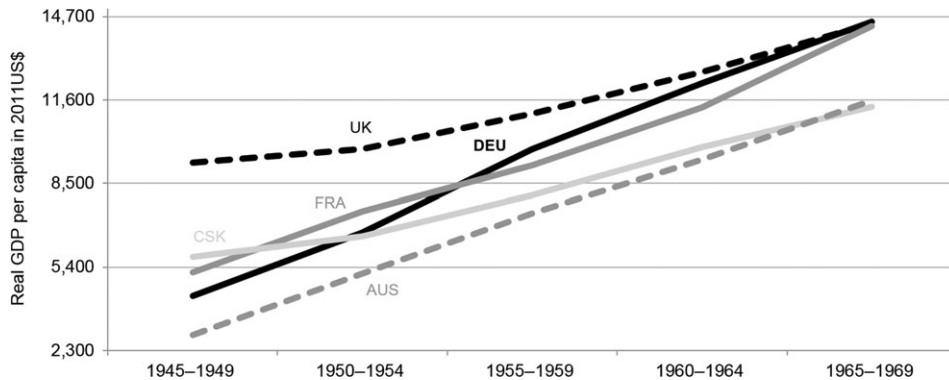


Figure 1. *Real GDP per capita in Germany and in Austria, Czechoslovakia, France, and the UK, 1945–1969.*

Source: Data are from Maddison Project Database Update of 2018.

Notes: Real GDP per capita is in 2011 US\$ with multiple benchmarks, so that account has been taken for cross-country income comparisons.

compound annual growth rate of 7.5 percent in the 1950s and virtually full employment by the 1960s.

There are many competing explanations for why West Germany fared so well (Eichengreen 1996; Temin 2002; Eichengreen and Ritschl 2009; Vonyó 2008, 2018). One is that it simply returned to its long-term growth path after the war (Jánosy 1969). This neo-classical post-war reconstruction/catch-up hypothesis, however, cannot account for the divergence between Germany and other equally devastated western European nations. Clearly, other policy and institutional factors must have played a role. A second common explanation contends that the war created an opportunity to re-allocate employment from low-productivity sectors like agriculture to high-productivity ones like manufacturing (Temin 2002). Yet, in Germany increases in labour productivity owed more to changes in the services sector than in manufacturing as the former absorbed most of the transfer of employment from agriculture after WW2 (Broadberry 1997). A third explanation proposes that growth arose from the formation of new trade partnerships in the late 1940s and 1950s (Sachs and Warner 1995; Bordo, Eichengreen and Irwin 1999). Yet, during the 1950s the degree of openness of the economy, reflected by the sum of exports and imports as a share of GDP, was actually lower in Germany (24.5 percent) than in the UK (43.2 percent), Austria (38.5 percent), and France (26.7 percent) (Penn World Tables 2015). Others emphasise the role of the end of Nazi state planning and subsequent introduction of free-market reforms following US, UK, and French interventions (De Long and Eichengreen 1993; Eichengreen 1996). In this paper, we attempt to show how the debt relief program in 1953, known as the London Debt Agreement (LDA), might have partially contributed indirectly to growth by creating a propitious economics environment as well as directly by stabilising German public finances and allowing for greater public investment.

Current economic turmoil in Europe has led some scholars to revisit the experience of West Germany's debt relief (Piketty and Zucman 2014; Sachs 2015). In June 1951, as part of the Marshall Plan, the Western Allied powers began to negotiate a plan that would, in

due course, eliminate half of Germany's external debt and stipulate generous repayment conditions for the remainder (for a review of the process see [Abs 1991](#)). The final agreement, called the LDA, was reached in London in 1953.

The LDA resulted in the reduction of the total pre-war and post-war debts that Germany owed from DM 29.7 billion to DM 14.5 billion ([Deutsche Bundesbank Report May 1959](#), 3–7; [Guinnane 2014](#)), which, in nominal terms, Germany's debts after WW2 nearly equalled its GDP for 1938 ([Ritschl 2014](#)).² The LDA also linked repayment of the remaining debt to Germany's economic growth and exports (so that the debt service/export revenue ratio could not exceed 3 percent). There were also provisions for creditor countries to renegotiate the terms of repayment if circumstances made debt service more onerous than originally thought; ultimately, this was not necessary given Germany's good financial and economic performance in the 1950s and 1960s ([Guinnane 2014](#)).

Could this debt relief help explain West Germany's growth miracle? Several commentators support this view to varying degrees. Ritschl, for example, claims that, "West Germany's economic miracle, the stability of the deutschmark and the favourable state of its public finances were all owed to this massive haircut" ([Ritschl 2011](#)). Other scholars suggest it played a lesser, albeit important, role. Eichengreen and Ritschl argue that "The German balance of payments benefited from the country's debts having been written down by the currency reform of 1948 and the London Agreement of 1953" ([Eichengreen and Ritschl 2009](#), 214). Similarly, [Piketty and Zucman \(2014, 93\)](#) state that the debt relief, "... help[ed] Germany move from a large net debtor position at the end of the war to a creditor position by the middle of the 1950s". This view is also shared by [Abs \(1991, IX\)](#), the leader of the German delegation at the London conferences, who argues that "thanks to the debt arrangement, not only did the Federal Republic restore its international creditworthiness, but the world also began to trust Germany once again" and by Adenauer (the German Chancellor between 1949 and 1963): "Without visible proof that the German creditor takes seriously the fulfilment of its old obligations, the rest of the world's trust in the German economy cannot be re stored" (seen in [Guinnane 2014](#), 99). Other commentators suggest that debt relief enabled institutional reforms and inspired investor confidence. According to Sachs, "Germany's new democracy needed the relief, and Germany needed a fresh start. The London agreement played a major role in the economic recovery and construction of Germany's democratic institutions" ([Sachs 2015](#)). Guinnane views debt relief as a necessary precondition for investment, and argues that "Settling the debt issue was not just a matter of reckoning with Germany's past—although that was necessary—but also of normalizing economic relations with the rest of the world" ([Guinnane 2015](#), 336).

To our knowledge, there is scant empirical evidence to address the validity of these hypothesised benefits.³ Virtually all economic history studies of the impact of the LDA have been descriptive, covering the details of the meeting itself from personal experiences ([Abs 1991](#)) or with a narrative about the development of the conference and its agreements ([Glasmann 1993](#); [Guinnane 2014](#)). To our knowledge, there has yet to be an analysis of the economic consequences of this debt relief even though, as several commentators have argued, the lessons from the LDA may be relevant to Europe's ongoing debt crises, in Greece, among others ([Kaiser 2013](#); [Sachs 2015](#)). Through our analysis, we will assess the

² There are alternative estimates, including those by [Kaiser \(2013\)](#), at 10 percent of 1953 GDP. What is clear, however, is that the reduction was substantial.

³ Similar to our review of the literature, [Guinnane \(2015\)](#) argues that "The London Debt Agreement has not received as much attention from economic historians as one might expect".

extent to which this analogy applies and argue that such calls for simple replication of the LDA are based on a misinterpretation of the events of 1953 and their sequelae.

Here, we take advantage of a new dataset to investigate the impact of the LDA, extracted from the official monthly reports of the Deutsche Bundesbank (the Central Bank of the Federal Republic of Germany). These reports are available from August 1948 until today and provide an accurate picture of German economic activity and public opinion. Moreover, from 1953 to the early 1970s, they contain numerous statistics and special issues on the LDA, underlying the inherent interest in the state of German public finances and public opinion of the debt cancellation. The rest of the paper is as follows: first, we review the context of the LDA and its place within the Marshall Plan and reconstruction (Section 2). Then, we outline the possible economic benefits of the LDA, exploring three potential mechanisms in which the LDA fuelled economic growth (Section 3), and changed the government's budget constraint compared to a counterfactual with no debt relief. Using differential effects and synthetic control analysis, we explore the extent to which the LDA freed resources to invest, showing that in the wake of the LDA the budget constraint was loosened for social spending such as that social spending and certain other categories grew faster than they otherwise would have without debt relief. Then, using a DiD model with bilateral trade with currency areas, we show that the LDA may have stabilised German finances and promoted growth by helping fulfil the requirement of sufficient US-dollar reserves to restore full and credible convertibility which in turn was reflected in higher confidence in Germany in the international markets. Another major economic benefit of the improvement in the inter-temporal budget constraint that the LDA engendered was to stabilise inflation and here too Germany compares favourably to other countries especially in the years immediately following the LDA. In Section 4, we highlight the lessons that we might learn from this historical episode.

2. The context of the LDA

Before analysing the consequences of the LDA, it is first crucial to contextualise it within the wider Marshall Plan (1948–1951) and economic rehabilitation of West Germany. Officially termed the European Recovery Programme (ERP), the Marshall Plan was a manifestation of US interest in European reconstruction, aiming to foster long-term recovery through a set of foreign aid and reform programmes. The ERP had economic and political goals, including combatting and containing Communism and incentivizing market-based economic activity. The Marshall Plan mobilised significant sums of financial aid to help rebuild and stabilise Europe's economies, amounting to a total of \$13 billion from 1948 to 1951 (roughly \$115 billion at 2010 prices or approximately 2 percent of the 1948 US GDP and about the same share of the collective GDP of the recipient countries; [Eichengreen 2010](#)). However, in monetary terms, the value of Marshall Plan aid to Germany was relatively small (\$1.4 billion) compared with sums provided to the UK and France.⁴

⁴ Along with the Marshall Plan, the USA launched another recovery programme, the Government Aid and Relief in Occupied Areas (GARIOA), with emergency aid to Japan, Germany, and Austria in the form of food to alleviate starvation. This programme amounted to \$1,793 million between 1945 and 1952, which was more than what was initially projected under the Marshall Plan ([Berger and Ritschl 1995](#)). While not part of the LDA itself, in September 1952 Germany also concluded a restitution agreement with the State of Israel, with a payment of DM 3,210 million in kind over twelve years to foreign individuals and the Jewish community. This amounted to roughly half of Israel's claim in the Conference on Jewish Material Claims Against Germany ([Dernburg 1954](#); [Guinnane 2015](#)).

For Germany, the other key economic elements of reconstruction besides the Marshall Plan involved three main structural reforms. First, the currency reform of 1948 introduced the DM, that converted most savings at a rate of 6.5 DM to 100 Reichsmarks and completely wiped out all domestic public debt (Lutz 1949; Piketty and Zucman 2014).⁵ Second, the European Payments Union (1950–1958) liberalised and promoted capital flows and trade with a programme of short-term credit to member states that experienced balance-of-payments difficulties (Buchheim 1990; Eichengreen 1993; Bordo 1993b; Vonyó 2018). It was only after these first two measures had been adopted, in 1953, that the third critical element, the LDA, was finalised (Berger and Ritschl 1995; Guinnane 2014; Ritschl 2012). The LDA was the most fragile element of the plan because it depended on the success of the first two. It was only undertaken once the USA, the UK, and France were satisfied that these prerequisites were fulfilled that the macroeconomic benefits of the LDA could begin.⁶

Hence, since West Germany's sovereign debt relief programme would not occur until some years after the currency reform and the European Payments Union, the Marshall Plan took account of this gap and explicitly blocked claims by creditor countries against Germany until 1953 (Dernburg 1953; Ritschl 1996). To do so, in 1947 the USA asked recipients of Marshall Plan aid to block claims against Germany until Germany had first repaid Marshall Plan aid (Dernburg 1953; Berger and Ritschl 1995; Ritschl 2012). Moreover, since West Germany was occupied until 1955 (although, in 1949, with the creation of the Federal Republic, the military governors were replaced by civilian high commissioners), the plans to foster the restoration of sovereignty and restructuring the burden of debt were two sides of the same coin (Guinnane 2014).

2.1 Implementation of the LDA

The LDA aimed to establish a macroeconomic equilibrium in which the amount that Germany would be required to pay would be linked to its ability to generate trade surpluses and its annual export earnings (with payments limited to 3 percent of annual exports). In other words, Germany would only pay down debt from its export growth. This would ensure that debt relief was sustainable and avoid problems which bedevilled Germany following the Treaty of Versailles (Keynes 1920). There were also provisions for creditor countries to renegotiate the terms of repayment if circumstances made debt service more onerous than originally thought.

At the time, critics expressed doubt that the LDA could actually solve such problems, as even though Germany had been running large surpluses with the European Payments Union area since 1951, no one could anticipate the "Wirtschaftswunder" and if surpluses were likely to persist, or if they would level off at a moderate amount (Dernburg 1953; 1954; Abs 1991). Clauses for renegotiating terms also could create a "moral hazard", as such flexibility might encourage a German successor government to flout their international obligations, such as by "gaming" conditions so to avoid debt repayment (Dernburg 1953; Guinnane 2014). Critics further argued that the plan could perversely encourage risky financial behaviour in the future (yet another manifestation of moral hazard this time by lenders), so increasing the risk of future debt repayment problems.

⁵ The currency reform also involved a comprehensive set of changes to wages, prices, and banking reform. See Lutz (1949) for the details.

⁶ Another reason why the LDA was delayed until 1953 is that the LDA could not occur until the US emergency plans ended. For example, the GARIOA only ended in 1952.

The LDA responded to concerns about moral hazard by incorporating Germany into the multilateral negotiations with private and public creditors creating a realistic repayment scheme. The LDA minimised the incentives for creditors to lend without evaluating the risk of the new loans, as the creditors assumed part of the losses if Germany was unable to pay. Hence, both parties shared the costs of hazardous or risky behaviour. It was also unlikely that other highly-indebted countries would seek a similar write-off of debt; Germany occupied a unique position as the only country in Europe expecting help because of its importance to a wider European recovery after WW2 and, politically, to counteract threats in the Cold War. Regarding solvency of private debtors, the LDA also enacted supervision through the German courts. For instance, *The Economist* announced that: “The international agreement, under which the Federal German Republic formally accepts responsibility for Germany’s prewar external debts, was signed in London last week by the representatives of nineteen countries... If any debtor refuses settlement along the lines laid down in the agreement, the German Government is to afford the creditors concerned the right to have the terms of the settlement established through German courts” ([The Economist 7 March 1953](#), 664).

It was also pointed out that the LDA forced West Germany to accept responsibilities for debts issued by political entities that no longer existed (such as Prussian states) and that West Germany was also paying some of the debts for the German Democratic Republic (East Germany). Critics further questioned the calculations of the total amount owed (e.g., the depreciation of the different currencies in which debt was owed altered the real amount of repayment and the calculation of the back interest; [Abs 1991](#)). Furthermore, [Abs \(1991\)](#) stresses that the negotiations were complicated at different points given the Allies’ diverse objectives. For instance, the USA’s initial plan was simply to forgive all debt that arose out of assistance after WW2 ([Abs 1991](#), 101). Differences also appear between private creditors and their governments, though the premise was to demand from Germany only what it could afford. [Rombeck-Jaschinski \(2005\)](#) also stresses difficulties between private creditors, creditor governments and Germany. Indeed, the Bundestag at first refused to ratify the agreement in 1953.

Nonetheless, despite these and other problems, [Dernburg \(1953, 309\)](#) describes how the press, when the agreement was signed in 1953, viewed the conditions agreed to by Germany as much better for Germany and creditors than had been anticipated during the negotiations in 1951 and 1952. International attention came from *The Economist*, *The Statist*, *The New York Times*, or the *London Times*, that viewed the relief as generous as circumstances allowed, meeting the willingness of Germany to restore its credit and with a clear success to anticipate problems during the negotiations. For instance, in the summer of 1952, *The Economist* commented that: “The agreed terms promise a more satisfactory settlement than many observers of the London Conference had expected. Until quite recently, these discussions had been viewed with caution, and even scepticism, owing to the immense complexity of the problem, to the ominous start given to the discussions by Germany’s first and derisory offer, and to the subsequent development of deep differences of views between various national groups of creditors... If agreement could none the less be reached, it was due to a spirit of co-operation and conciliation that very few expected to find at a conference of this kind” ([The Economist; August 16 1952](#), 408). Yet, there is also a sense that the US press was biased towards a business story, focusing largely on the implications for US private creditors. The West German newspapers on the other hand viewed the agreement as a fresh start for Germany and anything better than to continue in isolation

(Guinnane 2014, 100). More critically, however, were the East German newspapers that viewed the agreement as a deal among war criminals and something cooked in Wall Street.

The LDA eliminated half of Germany's external debt and stipulated generous repayment conditions for the remainder according to its export growth. This was attributed by some commentators to the strong desire on the side of Germany to restore its credit and to show that Bonn was not Weimar (Feldman 2005).

2.2 Debt repayment under the LDA

Debt repayment rapidly began after the conclusion of the LDA and was discussed recurrently in the monthly reports of the Deutsche Bundesbank:⁷ "From the coming into force of the various LDAs in August 1953 until September 1957 no less than DM 3.17 billion... had been paid in the form of ordinary and premature redemption and repayment of the pre-war and post-war debts settled in London" (Report November 1957, 45). According to the different figures reported by the Deutsche Bundesbank, by 1955, 15.2 percent of the original debt was already serviced, 30.7 percent in 1958, 46.4 percent in 1960, 72.2 percent in 1962, and 74.3 percent in 1964, and by the end of the 1960s more than three-quarters of the original debt had been settled. What was left was repaid in subsequent years.

Importantly, since Germany had systematically defaulted on most of its foreign loans since the early years of the Nazi-era, the LDA did not actually reduce payments on debt compared with pre-1953 years; Germany had not made any payments prior to 1953 for over two decades. Rather, the LDA reduced debt repayments relative to a counterfactual scenario in which Germany would have been forced to restart servicing its total pre-war debt on a much less favourable basis. As already seen, the LDA was the key element of the Allied forces and Atlantic community's plan to integrate Germany into the Western economy and, in the European context, the low levels of debt owed by Germany compared to its high indebted neighbours, left Germany in a very favourable position.

In addition, there were also opportunities to redeem or repatriate debts more rapidly through early repayments.⁸ According to the German economists working at the Deutsche Bundesbank: "anticipated repayment of external debts may be expedient and useful, and that at least in part it may contribute towards relieving the existing balance of payments tensions in Europe. That is why the German authorities have already for some time been practising and promoting the anticipated repayment of external debts within the limit of what is possible" (Report November 1957, 43). Hence, despite the fact that debts settled under the LDA formed the largest part of Germany's total external indebtedness, it was possible to take over the payments of debt according to the development of German finances and in connection with its balance of payments.

⁷ While some authors claim that for the period 1953–1958 only interest payments were due, giving breathing room for Germany to grow (Guinnane 2015, 19–20), others observed that repayments under the LDA began in 1953 and not in 1958 (Tooze 2011). The correct answer is that while some agreements (especially with the USA) enjoyed a grace period and began effectively in 1958, some others, such as the post-war aid with the UK, France, or the STEG Agreement, did not. As reported by the Deutsche Bundesbank: "The contractual repayment of the liabilities fixed in London in respect to post-war economic aid began in relation to the United Kingdom and France as early as 1953. On the contrary, the contractual repayment to the United States started only in 1958" (Deutsche Bundesbank 1961, 51).

⁸ According to the Deutsche Bundesbank Report of March 1964 (page 8): "within a decade the debt has been reduced, through redemption according to plan, premature repayments and the repatriation of external bonds, to about one-sixth of its original amount".

3. The economic benefits of the LDA

Did the LDA contribute to West Germany's subsequent growth? If so, how? [Ritschl \(2011\)](#) argues that "after the First World War and again after the Second World War, Germany was the world's largest debtor, and in both cases owed its economic recovery to large-scale debt relief". [Reinhart and Trebesch \(2016\)](#) have recently examined the aftermath of debt relief in 45 countries between 1920 and 1939, 1978 and 2010 and find that the economic situation of debtor countries improves significantly after debt relief, but only if these contain debt write-offs. They calculated that, on average, write-offs on the magnitude of 40–50 percent during the interwar period led to increases in GDP of 20–30 percent during the 5 years following the debt cancellation. However, while [Reinhart and Trebesch \(2016\)](#) look at the impact of debt restructuring during the interwar period and in recent decades, they do not look at what happened after WW2, thus excluding the LDA.

Debt relief can fuel growth in several ways. Figure 2 summarises the three potential mechanisms. The most obvious economic benefit is the extent to which debt relief reduces debt repayments relative to a counterfactual scenario and relative to other nations, thus freeing up resources to invest and loosening the inter-temporal budget constraint of a government ([Krugman 1988](#)). Second, the LDA also provided stability to German finances after decades of political and economic instability, thus reducing the likelihood of a new default and waterproofing financial stability ([Reinhart, Reinhart and Rogoff 2015](#); [Reinhart and Trebesch 2016](#)). By improving the balance of payments, the return to convertibility was promoted. Thus, the LDA improved confidence in Germany of international capital markets and facilitated re-integration into the global financial system. Finally, debt relief also brought an inflation stabilising component to the German economy ([Piketty and Zucman 2014](#)). We consider each of these mechanisms in turn.

3.1 Benefit 1: creating fiscal space for investment

One of the principal intended economic benefits of the LDA was reducing total debt relative to the original amounts owed, and which would eventually have had to be re-paid or defaulted on outright. The negotiated debt reduction of LDA freed up fiscal space relative to a situation where Germany re-commenced re-payment on total accumulated claims. This space could then be used for domestic investment and to satisfy pent-up demand for social expenditure after the initial emergency plans of the Marshall Plan ([Eichengreen and Ritschl 2009](#); [Guinnane 2014](#); [Vonyó 2018](#)). Although the design of the LDA tied

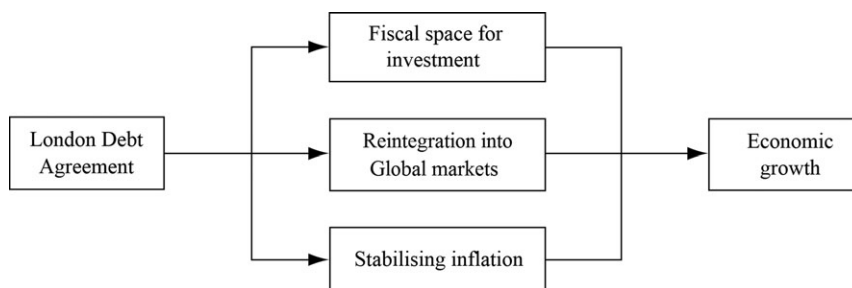


Figure 2. *Conceptual framework.*

repayment to trade surpluses, during the 1950s the amounts owed under the LDA were still a substantial burden for German finances (Glasmann 1993; Ritschl 2014). Therefore, in a counterfactual scenario of doubling debt repayment, it is hard to imagine how Germany could have serviced its debt without fiscal struggle. During the 1950s and the first half of the 1960s, Germany did not contract any significant foreign debts until the DM revalued within the Bretton Woods system in March 1961 (Report April 1963, 8).

Allied powers were also concerned about problems in attaining domestic investment goals if large repayments were demanded. Early in the negotiations, under the *Committee for Fundamental Questions*, Abs highlighted three factors where large repayments would exert a negative influence in the long-term. First he listed the expropriation of foreign assets. Second, the sustainability of social expenditure, and third the supply of raw materials and the investments for the reconstruction of basic infrastructure (Abs 1991; Rombeck-Jaschinski 2005, 199–200). Regarding the problems of balancing the budget, Abs was also worried that the post-war situation could only worsen the burden of the public budget and made the case that given the influx of low skilled migrants and refugees coming from East Germany and unemployment, “an additional burden on the state budget could be expected through additional social spending” (seen in Rombeck-Jaschinski 2005, 200).

The LDA mostly prioritised spending on social welfare because other spending was rather limited or blocked. For instance, since West Germany was an occupied territory, it did not have armed forces on its own until 1955, and the building up of potent national defence took many years even after the start of rearmament (Vonyó 2018, 202). Spending on trade to promote exports was also limited as this mechanism followed the EPU system. These new funds were also not used for emergency relief, because the Marshall Plan and the aid programme under the Government Aid Relief in Occupied Areas (GARIOA), which ended, respectively in 1951 and 1952, were the main elements of the Marshall Plan to provide relief assistance (mostly on food, fuel, and medical supplies) along with social investment (De Long and Eichengreen 1991; Dernburg 1953; Guinnane 2014).

Social spending, on the other hand, rapidly increased with the ratification of the LDA. For instance, on housing Vonyó (2018, 209) notes that “Social housing was not only one of the most activist instruments of public policy in post-war Germany, [but] it also created legacies that persist even today”. Stolper and Roskamp (1979, 399) also show that social spending was mostly exogenous to the business cycle: “Investment in residential construction was largely independent of market forces; as a social necessity it was pushed as much as available resources permitted”. Indeed, there is historical evidence that social spending was intentionally “blocked” prior to the LDA. Finance Minister Schäffer specifically sought to reform the social system, but waited for debt settlement. He made the case that social services financed by federal funds were contingent to debt repayment (Hockerts 1977, 356; Schwarz 1991, 57).

Fiscal policy was also tied to the political agenda with federal elections coming in September of 1953. In his campaign, Adenauer promised large increases on social spending for a new social era. For instance, during the spring of 1953 *The Economist* commented that Adenauer’s “programme called for, although not in very specific terms, an improved system of social welfare that would look after the young and all the millions who have suffered from the effects of the war” (*The Economist*; 2 May 1953, 313). Not surprisingly, coinciding with the signature of the LDA, in February of 1953, *The Economist* noted that “a whole series of increases in social welfare payments has been added to the already very heavy German burden” (*The Economist*; 7 February 1953, 366). Similarly, also in 1953 *The New York Times* informed that “Reports from well-informed sources in Germany strengthen the belief that at the general elections in Germany on Sept. 6, Chancellor Konrad Adenauer

will be returned to power. One immediate result would be re-creation of an efficient capital market in Germany to enable all existing capital reserves to be mobilized for constructive use” ([The New York Times; August 18 1953](#), 13). [Leaman \(1988, 210\)](#) also argues that new funds for social investment followed the elections of 1953.

Hence, during the 1950s, the most important category of expenditure was that of social welfare (26.9 percent). This was followed by investment in defence, law and order (15.4 percent), education (8.9 percent), housing (8.6 percent), economic development (6.5 percent), and health (4.75 percent) ([Weitzel 1967](#)).

The Reports of the Deutsche Bundesbank also show evidence of hedging against a worse counterfactual. For example, 10 years after signing the LDA and when most debts were repaid, the German officials still highlight that “Interest payments under the LDAs, which for a long time had determined the course of net investment income, were of only subordinate importance in 1962 because such debts had been largely repaid” ([Report of January 1963](#), 48–49). The [Report of January 1961](#) (p. 62) also discusses that “the position on investment income greatly improved by comparison with the previous year... This was due to an increase by more than DM 200 million in the receipts, chiefly comprising interest received by the Bundesbank, while income payment to foreigners remained practically unchanged. One reason why the outgoings to foreign countries did not rise in view of the large capital imports which the Federal Republic recorded in 1960 was that, because of the steady decline in outstanding indebtedness, the interest payments under the London Debt Agreements are continuously decreasing” (see also the [Report of April 1960](#), 38).

In discussing whether the debt written down in the LDA freed resources to invest, [Eichengreen and Ritschl \(2009, 214\)](#) opine that “what really seems to have mattered for Germany’s fiscal system was the absence of large interest burdens on the public budget that allowed Germany to keep tax rates low and insulated the public budget from balance-of-payments pressures”. Similarly, [Guinnane \(2014, 101–102\)](#) comments that “The London Debt Agreement represented a pragmatic understanding of Germany’s potential role in Western Europe’s economic and security system” and that “The London Agreement had one immediate effect: private investment in Germany resumed” ([Guinnane 2014](#), 91). [Andic and Veverka \(1963, 204\)](#) also discuss low debt burdens relieved social spending: “the secular growth of the public sector... lies not only in the relatively low levels of defence expenditure but also in the almost complete absence of national debt” and Vonyó pushes the idea that “social policy rather than economic policy made the most critical contribution to West German growth miracle” ([Vonyó 2018](#), 175).

These arguments about relaxing binding constraints for new welfare spending are not entirely new. Sachs has long argued that prior to debt relief debt servicing was often prioritised over social spending in Highly-Indebted Poor Countries (HIPC). For him, the “capacity to pay must be judged according to the alternative uses of funds claimed by debt servicing... If the resources were freed up and successfully redirected towards basic human needs, there could be significant improvements in human welfare... For many of the HIPCs, by contrast, the most basic human needs are jeopardized by the continuation of contractual debt servicing” ([Sachs 1999](#), 4). Indeed, Sachs makes the particular case that debt relief, rather than trade surpluses, account for new domestic spending: “The export-based ratios are irrelevant to capacity to pay (the governments do not own the export revenues; nor does a debt-to-export ratio address the tradeoffs between debt servicing and social spending). The new debt-to-government revenue target is an improvement, but is numerically arbitrary and offers no way to assess the tradeoffs between urgent social spending and debt servicing” ([Sachs 1999](#), 416).

We next explore whether in the wake of debt relief the budget constraint was loosened for social spending such that social spending and certain other categories could now grow faster than they otherwise would have without debt relief. Obviously, in any treatment-control design the counterfactual is an assumption and untestable (e.g., the debt relief also affected non-social spending) and levels of impoverishment in post-WW2 Germany were lower than today's HIPC's (Guinnane 2014), but commentary by Abs during the negotiations, contemporary observations and work on HIPC debt relief make parallel trends (i.e., that social spending would not have grown relatively quickly in the absence of an LDA agreement) very plausible.

We use the data from Weitzel (1967) originally collected from the German financial office (*Statistik der Bundesrepublik Deutschland*).⁹ These data refer to the entire government budget rather than central expenditure alone and report nominal expenditure in 24 groups that we regrouped into 14 meaningful categories. For instance, the category “education” consists of primary education, secondary and tertiary education, while “health” includes health services, social and healthcare expenditure and other social services. It seems that data on the semi-public social insurance system are included under the healthcare system.¹⁰ To the best of our knowledge, Weitzel possesses the only dataset with budget expenditure data going back to 1948 with yearly data for different spending categories and, as he comments, despite the limitations of the functional organisation of the Imperial period, after World War I the German financial statistics were prepared using almost unchanged principles (Weitzel 1967, 152).

The LDA not only affected the budget from the central government, but also alleviated regional budgets (made by states and local authorities) (Guinnane 2015, 10–11). For instance, throughout the 1920s and 1930s, German states and regional units (municipalities and cities) had considerable fiscal autonomy with rights to float loans abroad and in Germany and quickly increased their external debt position (James 1986). As the legal successor of the German Reich, West Germany recognised its responsibility for the state debt despite avoiding municipal obligations issued by cities that were located in East Germany (Article 25 of the LDA Treaty). According to Guinnane (2014, 95), “it would have been perverse to force the citizens of West Germany to repay debts incurred by Dresden or Leipzig.” Yet, by March 1928, debt from what later become East Germany amounted to a maximum of 1,353 million of DM (this figure might be lower as the Treaty excluded cities in the former state of Prussia) compared to a total debt of 4,422 million of DM of what later become West Germany.¹¹ Debt owed by states was even smaller (in total by March 1928, this amounted to DM 736 million). Further burden was placed on West Germany due to the assumption of debt incurred by the Austrian government during the *Anschluss* (the annexation of Austria into Germany on March 1938) (Guinnane 2005, 336).

To explore the impact of the LDA and the new funds associated with the debt relief on German finances, we use differential effects that explains variations in 14 different types of expenditure in the budget, using as a dependent variable the level of expenditure (in marks)

⁹ Data are available in Weitzel (1967, Tab. 26c) under “functional breakdown of public expenditure” (1948–1962) and also in gesis (<http://www.gesis.org>). Weitzel reports a full Appendix showing the detailed sources that were used (*Statistisches Quellenverzeichnis*).

¹⁰ Weitzel stresses that great attention was taken to avoid double counting in issues related to the social insurance between the different levels of government.

¹¹ To estimate the municipal amounts owed in 1928 for what later become East Germany, we added the data from Anhalt, Berlin, Brandenburg, Sachsen, Thüringen, Mecklenberg-Strelitz, and Mecklenberg-Swerin. Municipal and state level data are from the *Statistisches Jahrbuch für das Deutsche Reich* (1930, Table 17: 452–453).

per capita adjusted for inflation. In the treatment group, we include four social spending budgets and in the control group non-social spending. Specifically, we run the following regression:

$$y_{ct} = \alpha_0 + \sum_{s=1}^4 \beta_s (\text{social}_s) \cdot \text{Post}_t + \text{Post}_t + \text{social}_s + \varepsilon_{ct} \quad (1)$$

where y_{ct} is real expenditure per capita for spending category c , *social* is an indicator equal to one for four social spending categories (economic development, education, health, and housing), *Post* is an indicator equal to one from 1953 until 1962 and ε is an error term.

We hypothesise that social expenditure will grow relative to the other ten categories from 1953 following implementation of the LDA. We use the data from Weitzel (1967), and aggregate the budget expenditure into fourteen consistent categories for the period 1948–1962.¹² The post-treatment period begins in 1953, so the indicator *Post* equals zero for the years 1948–1952 and one otherwise. Additionally, we explore where the treatment group is social expenditure, which groups the spending categories of health, education, economic development, and housing. The control group contains the remaining 10 categories. We investigate the issue of parallel pre-trends graphically in Figure A1 of the Appendix. This figure shows that while spending in social and non-social categories was about the same in 1948 and grew at roughly the same speed as other categories between 1949 and 1952, after 1953 spending in social categories grew much faster than spending in non-social categories.

We take into account potential developments that might be responsible for the faster growth of social spending around the time of the LDA. In particular, we consider the role of the *Lastenausgleich* (an equalisation of war losses), which came into force on 18 August, 1952 and was an important tax on assets, the revenue from this tax was earmarked for social spending on refugees and war-damaged firms and individuals (Strecke 2006). However, according to the classification made by Weitzel (1967), these funds are allocated and subsumed in the budget for Defence and Special Warfare (*Verteidigung und besondere Kriegsfolgelasten*), and therefore are not in our treatment group (Weitzel 1967, Tab. 26c).¹³ A first version of the *Lastenausgleich*, the *Soforthilfegesetz*, was implemented on 8 August, 1949 long before when it could have affected the impact of the LDA in our models. If these policies were driving any growth in social spending our results should be biased towards zero given the category into which this spending is classified.

¹² These are: administration of justice, agriculture, church and culture, defence, economic development, education, financial management, health, housing, internal administration, public safety and order, regional and community spending, trade and commerce, and war burdens. We aggregate some of the categories initially proposed by Weitzel (1967) and for example, primary, secondary and higher education were collapsed in a single category, education.

¹³ Weitzel comments that “After the defeat of the Nazi regime ... the war burdens increased. In particular war-related social needs ... In the first few years of the Federal Republic, in particular, the “military policing expenditures”, as well as the services of the LAG [LAG stands for *Lastenausgleich*], fund for agriculture, industry and housing construction are of paramount importance” (pp. 247–248). He further comments that he ascribes the *Lastenausgleich* and social war related spending under “war-related expenditure” (*Kriegsbedingten Staatsaufwands*), and hence in “military and defence expenditure” following the work of Thoma (1962) with an article entitled “*Lastenausgleich*” (see footnote 5 of page 247 for details). He also shows the funds on war-related expenditure (including the *Lastenausgleich*) in Table 34 under the category Social Warfare (*Soziale kriegsfolgelasten*). See also Strecke (2006).

Next, we present the results of the differential effects (table 1). Results suggest that each category of social expenditure grew much more quickly after 1953 relative to other categories. All coefficients are statistically significant. Indeed, results are consistent with the idea that the LDA loosened the public budget constraint allowing for greater social expenditure. The largest increase is in health expenditure followed by roughly equal increases in education and economic development. Housing expenditures also rise on a per capita basis, but by half the amount of education and economic development. This might be because of the Housing Act of 1950 where the West German government provided publicly subsidized housing and gave big tax breaks to builders (Diefendorf, Frohn and Rupieper 1993). Overall our results are consistent with observations by Deutsche Bank (Report January 1963, 47) that debt repayment under the LDA determined to a large extent the course of public investment and expenditure in the German economy and as debts were repaid (or cancelled) this freed up new resources to further public investment. Additionally, as we will describe in the next section, repayments made a genuine contribution towards easing the balance of payments, which allowed Germany to accumulate foreign reserves, lessening the potential financial constraints imposed by the balance of payments (Eichengreen and Ritschl 2009).

We tested the robustness of this baseline differences regression in several ways. First, we ran fixed effects regression allowing for separate intercepts for each of the fourteen

Table 1. *Differential effects using the spending categories of health, education, economic development and housing as the treated group and other categories as the control group in DM, population and inflation adjusted*

Government spending category	Pre-LDA	Post-LDA	DiD
Economic development	1,302	3,806	1,515
Non-social spending	1,160	2,147	(544)
Diff (T-C)	145 (262)	1,659 (476)	0.006*** [2.79]
Education	2,454	5,898	2,457
Non-social spending	1,160	2,147	(632)
Diff (T-C)	1,294 (384)	3,751 (502)	0.000*** [3.89]
Health	7,691	15,304	6,626
Non-social spending	1,160	2,147	(1,305)
Diff (T-C)	6,531 (1,156)	13,157 (606)	0.000*** [5.08]
Housing	2,055	4,215	1,173
Non-social spending	1,160	2,47	(510)
Diff (T-C)	895 (426)	2,068 (282)	0.023** [2.30]
Number of observations	165	165	165

Source: Data are from Weitzel (1967).

Notes: The dependent variable is the level of real spending per capita. “All other spending categories” in the control group include administration of justice, agriculture, church and culture, defence, financial management, internal administration, regional and community spending, public safety and order, trade and commerce, and war burdens. Pre-LDA period is 1948–1952 and the post-LDA period is 1953–1962. Means and Standard Errors are estimated by linear regression. Robust standard errors are in parentheses. *P*-values are immediately below the standard errors and robust *t*-statistics are in brackets, ****P* < 0.01; ***P* < 0.05; **P* < 0.1.

Table 2. *Differential effects regressions for social spending per capita, in DM*

	(1)	(2)	(3)	(4)	(5)
	Spending/ person	Spending/ person	Spending/ person	ln (spending/ person)	Expenditure share
Social Spending × Post-LDA	2,943	2,943	2,943	0.142	1.659
	(1,054)	(1,092)	(1,150)	(0.035)	(0.742)
	0.006***	0.007***	0.024**	0.112	0.043**
	[2.79]	[2.70]	[2.56]	[1.71]	[2.24]
<i>N</i>	210	210	210	210	210
Bootstrapping SE	No	Yes	No	No	No
Year fixed effects	No	No	Yes	Yes	Yes
Category fixed effects	No	No	Yes	Yes	Yes

Source: Data are from Weitzel (1967).

Notes: The dependent variable is the level of real *social* spending per capita in column (1–3), in column 4 we take the natural logarithm of the level of real social spending per capita, and in column 5 the share in expenditure in real social spending. For the variable *social* spending, we aggregate all four social spending categories (health, education, economic development, and housing) into one treatment group. Other spending categories in the control group include administration of justice, agriculture, church and culture, defence, financial management, internal administration, regional and community spending, public safety and order, trade and commerce, and war burdens. Regressions are estimated by linear regression. Robust standard errors clustered on expenditure category are in parentheses. To account for potential sample bias estimates in column 1, we bootstrapped standard errors in column 2. *P*-values are immediately below the robust standard errors. Robust *t*-statistics are in brackets, ****P* < 0.01; ***P* < 0.05; **P* < 0.1.

expenditure categories. Point estimates are exactly the same, but standard errors are significantly smaller. We then explored three specifications which aggregate all four social spending categories into one treatment group. We use the level of real spending per capita, the logarithm of real spending per capita and the level of the expenditure share (ratio of category expenditure to the total) as dependent variables. All specifications include fixed effects for each of the fourteen categories of spending and year fixed effects. These results are reported in table 2. All point estimates are positive and economically significant. Column 4 suggests the LDA was associated with higher social spending on the order of 0.142 log points. The coefficient in the specification using the logarithm of spending is positive, but only marginally significant (*P*-value = 0.122). Column 5 of table 2 shows that the share of social spending rose by roughly 1.7 percentage points relative to other categories after 1953.

Additionally, we estimated a “fully flexible” model allowing for separate coefficients on the social spending category in each year of the sample (also including year dummies and fixed effects for the fourteen expenditure categories). Figure 3 shows the results graphically. While social spending was not generally growing significantly differently from other categories prior to 1953, after 1953, in each year, spending per capita is relatively higher. Most coefficients post-1953 are significantly different from zero and increasingly larger suggesting an adjustment to a longer run equilibrium.

We also check whether our results are contingent upon the number of spending categories in the control group and whether the years immediately after the LDA produce the

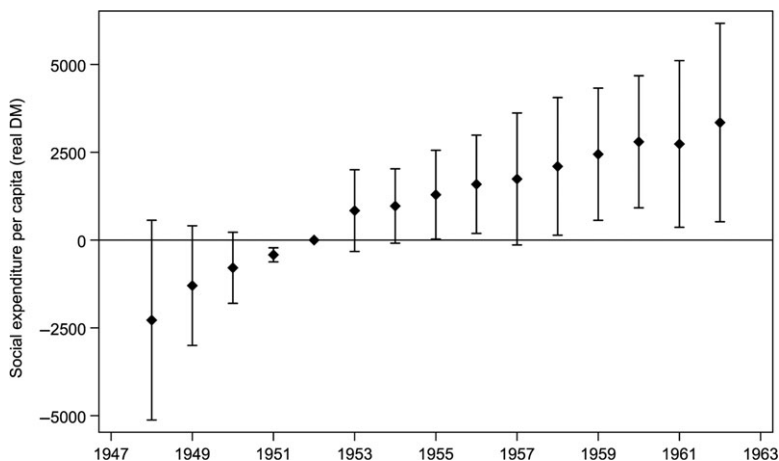


Figure 3. Year specific estimates of real social expenditure per capita in real DM, 1948–1962.

Sources: Data are from [Weitzel \(1967\)](#).

Notes: The dependent variable is social spending per capita, see text. Coefficients are estimated by OLS. Regression includes fixed effects for each spending category and year indicators. Social expenditure includes four categories of spending: economic development, health, education and housing. 95 percent confidence bands based on robust standard errors.

same meaningful results as 1953. First, in column 2 of table 2, bootstrapped standard errors show the same overall results as our baseline specification. In addition, a Jackknife estimator also achieves similar quantitative results.¹⁴ We also replicate the results for table 1 with bootstrap and Jackknife resampling methods in the standard errors, running 40 new regressions each time leaving out one spending category in the control group.¹⁵ In all cases, spending categories in the treatment group were statistically significant. Second, for the social spending budget, instead of making the post-treatment period begin in 1953, as a robustness check we also allow it start in 1954, 1955, and 1956 so, respectively, the indicator *Post* equals zero for the years up until 1953, 1954, and 1955 and one otherwise. Using our baseline specification in table 2 (column 1), if the post-treatment period begins in 1954, the *P*-value climbs sharply to 0.037 (instead of 0.006), if the post-treatment period begins in 1955, the *P*-value is even higher 0.093 and for 1956, the *P*-value rise so that the LDA treatment effect becomes statistically insignificant (0.173).

In table 3, we also attempt to look at whether social expenditure in Germany grew faster after the LDA relative to other European nations with a triple dummy variable interaction term (column 3). We use data on the share of spending in economic development originally from [Flora \(1983\)](#) and updated by [Lindert \(2013\)](#). Flora's data provides information on eight spending categories plus a residual. After using equation (1) and applying year and category fixed effects in column 2, we also try to explain variations in the share of central

¹⁴ The Jackknife deletes each observation and calculates an estimate based on the remaining $n-1$ of them, and uses this collection of estimates to estimate the bias and the standard error.

¹⁵ That is, ten regressions for each spending category in the control group for the four spending categories in the treatment group.

Table 3. *Differential effects regressions for expenditure share in economic development across European countries*

	(1)	(2)	(3)
Expenditure share in economic development	8.876	8.089	6.837
x Post-LDA	(4.216)	(3.131)	(2.754)
	0.038**	0.082*	0.021**
	[2.11]	[2.58]	[2.48]
Number of observations	86	86	509
Number of groups	—	—	24
Year fixed effects	No	Yes	Yes
Category fixed effects	No	Yes	Yes
Country fixed effects	No	No	Yes

Notes and Sources: We use data on the share of spending in economic development originally from [Flora \(1983\)](#) and updated by [Lindert \(2013\)](#). The dependent variable is expenditure share in economic development. Other spending categories in the control group include defence, police and security and debt. We did not include other social categories such as education or housing. The countries in the control group include Austria, France, Italy, the Netherlands, and the UK. As in equation (1), the post-treatment period begins in 1953, so the indicator Post equals zero for the years 1948–1952 and one otherwise. Central Government expenditure for Germany for the years 1948 and 1949 interpolated from the General Government. Central government “debt interest” data for Germany in 1969 interpolated from general government spending for the same year. Given the missing data for different countries “social security” (missing data for Austria, France, Italy, and the Netherlands), we did not include data on health expenditure. Robust standard errors are in parentheses. *P*-values are immediately below the robust standard errors. Robust *t*-statistics are in brackets, ****P* < 0.01; ***P* < 0.05; **P* < 0.1.

government expenditure in economic and social development across time (data are available from 1948 to 1964, with the years before 1953 defining the treatment period) and between European countries (Austria, France, Italy, the Netherlands, and the UK).

We use central expenditure as it reports German data for the years 1948 and 1949 and because government expenditure (including states and municipalities) was not available for all countries. The main limitation of this analysis is that we are forced to rely on a cross-country panel of social expenditure data across European nations that may not be fully consistent. For instance, there may be substantial difficulties when identifying spending in social security programs and social health insurance across countries (e.g., “for some countries/periods an inclusion of social insurance proved to be too difficult” [Flora \(1983, 345\)](#)). Therefore, we use data on economic development (economic services and spending in transport and communication) and do not add other spending in social categories such as spending in public health due to cross-sectional problems in the treatment group. Similarly, we avoid including social spending on education or housing in the control group. In this case, the control group of spending categories includes data on defence, police, security, and debt. Despite important data limitations, results suggest that expenditure on economic development in Germany, as compared with spending on debt repayment, defence, and police, grew much more quickly after 1953 relative to other spending categories and relative to other European nations.

Importantly, to explore the extent to which the LDA changed the government’s budget constraint compared to a counterfactual with no debt relief, we use the synthetic control method to see by how much expenditure and revenue would have been in the absence of debt relief. The “Synthetic control” method allows us to compare Germany to a weighted set of matched comparison countries which did not receive debt relief in the same period

(a control group) that approximate the counterfactual and show how expenditure and revenue would have evolved without the LDA. Using the new data from the Macrohistory database (Jordà, Schularick, and Taylor 2017), this counterfactual “synthetic control” is estimated using the values of predictors of the outcome (exports, GDP per capita, level of population, and inflation) in comparison countries (Australia, Belgium, Canada, Finland, France, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the USA) between 1948 and 1964.

The matching algorithm of “synthetic control” selects comparison units by iteratively assigning weights to each comparison country and then selecting the combination of countries and weights that minimises the distance between the value of predictors in the combined synthetic control unit and their observed values in the treated country before the intervention.¹⁶ This minimisation algorithm also creates a balance between the treated country, Germany, and the synthetic control, by prioritising variables that have the greatest predictive power on the outcome. The estimated effect of the LDA is then estimated by a comparison of the observed post-treatment outcomes in the treated unit and the estimated outcomes in the synthetic control (for the details of the method see Abadie, Diamond, and Hainmueller 2010).

Figure 4 shows that the trend in expenditure and revenue was very similar in Germany compared to the control before the LDA but, after the LDA, the two trends diverge: expenditure and revenue accelerates in Germany, while in the control group estimated expenditure and revenue were much lower than the real values. In 1954, the difference between Germany and “Synthetic Germany” in expenditure and revenue would have been 16.67 percent and 4.17 percent, respectively, and in 1960, 17.07 percent and 24.39 percent, respectively. This gap shows how much expenditure and revenue there would have been in post-WW2 Germany under the counterfactual of no debt relief.

The years after 1953 witnessed not just increases on the expenditure side but, as the recovery took off, from the revenue side as well so that the cumulative surpluses were of much greater magnitude than prior to 1953. In the winter of 1953, *The Economist* also commented on Schäffer’s tax cuts: “his cuts will have done a great deal to ensure that Dr. Adenauer’s party... wins this year’s elections; and his reforms will have given fresh stimulus to German industry” (*The Economist*; 7 February 1953, 366). Figure A2 of supplementary material shows the yield of main Federal taxes and taxes of the states such as the wages tax, assessed income tax, corporation tax, property tax, and turnover tax (adjusted for monthly “seasonality” with year dummies). Revenue from all these taxes also started to increase coinciding with the LDA in 1953. As already argued by Eichengreen and Ritschl (2009) and Piketty (2014), after 1953 the yield of the main taxes was higher than previous years allowing, in turn, the government to lower tax rates to further stimulate the economy. This fiscal expansion potentially created a virtuous circle whereby the LDA generated some faster growth, with a rise in the tax yield, which allowed the German government to lower taxes with this higher yield creating further economic stimulus.

Finally, data from Rahlf (2015) also show that capital flows rose quickly after 1953 as Germany re-integrated into the international system and stabilised its finances. Germany’s balance of payments and net international position likely also improved. Foreign deposits

¹⁶ Indeed, this is a particularly well-suited method to account for aggregate shocks since although it builds upon the setting of the standard difference-in-differences model, it makes two important changes to account for shocks: it allows for time-varying individual-specific heterogeneity and takes a data driven approach to forming counterfactuals through selecting the control group.

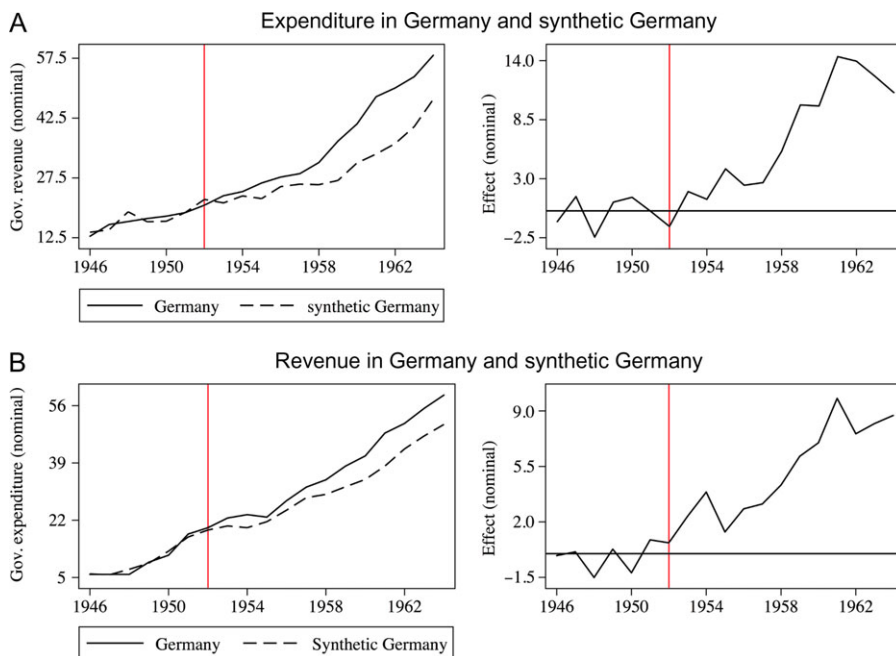


Figure 4. *Expenditure and revenues in Germany and synthetic Germany, 1946–1964.* Sources: Data from [Jordà, Schularick, and Taylor \(2017\)](#) and [Flora \(1983\)](#). Notes: For expenditure (Panel A) – since the data from [Jordà, Schularick, and Taylor \(2017\)](#) do not report revenues for pre-1950 years, we extrapolated them using the data from [Flora \(1983, 391\)](#) as they move nearly exactly the same for post-1950 years. The treated unit is Germany and the control units are Australia, Belgium, Canada, Finland, France, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the USA. The predictor balance for exports is 7.146 (and for the synthetic exports 5.380), real GDP per capita (in purchasing power parity) 3,142.636 (synthetic GDP is 3,161.085), population level is 49,950.33 (and synthetic population is 62,446.45) and the consumer price index (CPI) is 29.322 (and synthetic CPI is 9,818). We used a “nested” optimisation procedure that greatly improves pre-intervention RMSPE (Root Mean Squared Prediction Error) and the predictor balance on variables, with an RMSPE of 0.863. For revenue (Panel B) – since the data from [Jordà, Schularick, and Taylor \(2017\)](#) do not report revenues for pre-1950 years, we extrapolated them using the data from [Flora \(1983, 306\)](#) as they move nearly exactly the same for post-1950 years. The treated unit is Germany and the control units are Australia, Belgium, Canada, France, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the USA. The predictor balance for exports is 7.146 (and for the synthetic exports 12.88), real GDP per capita (in purchasing power parity) 3,142.636 (synthetic GDP is 4,131.879), population level is 49,950.33 (and synthetic population is 51,346.7), and the CPI is 29.322 (and synthetic CPI is 12.398). We used a “nested” optimisation procedure with an RMSPE of 1.355.

held by the German Central Bank declined by 25.51 percent between 1949 and 1952, but subsequently increased by 17.16 percent between 1953 and 1957 (Table 15.3 Series x681). The compound annual growth rate between 1953 and 1958 for Central Bank foreign assets was 26.42 percent (Table 15.3 Series x684) and for the foreign assets of German banks was 51.86 percent (Table 15.5 Series x706). Not surprisingly, as [Giersch, Paque, and Schmieding \(1992, 114\)](#), and others argue, it was only after the London “agreement had come into force as at mid-September 1953, [that] West Germany swiftly began to lift the tight restrictions on capital flows”. Some historians also hypothesised that the LDA was a decisive mechanism for reaching full employment in 1955 ([Kaiser 2013](#); [Kaplan and Schleiminger 1989](#)).¹⁷

3.2 Benefit 2: reintegration of Germany into international markets, sustainability of German finances and full convertibility of the DM

The LDA also played an important role for the improvement of the German finances, which could be observed through the impact of the LDA in bringing about the full convertibility of the DM within the Bretton Woods System. During the negotiations of the LDA the convertibility of the DM was a key issue for German leaders, banks, and firms. When the negotiations of the LDA were fragile, Abs wrote a letter to Adenauer saying that: “Dear Chancellor, I received your letter and read it with interest. I can only remark that the London Debt Agreement is not a hindrance to achieving the convertibility of the Deutsche Mark, but the prerequisite” (seen in [Glasmann 1993, 5](#)).¹⁸

[Dernburg \(1954, 537\)](#) also opines that “Germany’s over-all position vis-a-vis the dollar area in 1954 and thereafter will be influenced not only by her dollar-import liberalization move but also, and even to a larger extent, by the resumption of transfers on her large foreign debt under the London Debt Agreement”. Similarly, [Dornbusch, Nolling, and Layard \(1993, 24\)](#) comment that “The goal of *full currency convertibility* on the capital account could have been reached much earlier than 1958, though not before the London Debt Agreement had been concluded” (*italics in original*) and [Giersch, Paque, and Schmieding \(1992, 105\)](#) that “until the issue of Germany’s external indebtedness was finally resolved by the London Debt Agreement in early 1953, West Germany was de facto excluded from the international capital market”. [Piketty and Zucman \(2014, 93\)](#) noted that “the London debt agreement also explains why there is a large net capital transfer recorded in 1953”.

The LDA was a necessary condition for the reintegration of Germany into the international financial markets and helped it to achieve convertibility of the Mark. Technically, while in the early 1950s the problem for reintegration of Germany into global markets was not so much to raise funds for debt repayment in DM, but its ability to transfer these funds from DM into hard currencies (US-Dollar), sufficient US-Dollar reserves were needed with a surplus in foreign exchange ([Dernburg 1954](#)). Thus, if the LDA led to the sustainability of Germany’s finances, we should observe that just after the implementation of the LDA Germany substantially increased its US-Dollar reserves; directly through trade with the USA and indirectly within the European Payments Union (EPU) clearing mechanism.

¹⁷ For instance, [Kaiser \(2013, 15\)](#) argues that “the result of this debt-trade-link was a substantial contribution to Germany reaching full employment very quickly, thanks to a strong export performance”.

¹⁸ [Glasmann \(1993, 5\)](#) further comments that the LDA was decisive for West Germany to “quickly gain trust and creditworthiness abroad as a prerequisite for economic reconstruction. The convertibility of the Deutsche Mark was faster than many had expected”.

It is crucial to stress how the LDA shaped German finances looking at the changing rhetoric of the German officials before and after the implementation of the LDA. For instance, in the early months of the LDA, sufficient US-Dollar reserves were an initial concern raised by German officials, though they also argued that this situation was attributable to the successful implementation of the LDA. The [Report of July 1953](#) (p.14) stressed that “in the further course of the second half of the year, however, it is likely that the German balance-of-payment surpluses will appreciably diminish, not only in relation to the E.P.U. area, but also to the other currency areas, and in particular the dollar area ... [However,] the German government intends, once the London Agreement has come into force, to make a start with the transfer to other countries”. Similarly, the [Report of September 1953](#) (p.26) discusses that “it therefore remains to be seen how the dollar balance of payments will move during the next few months if the seasonal factors become less favourable, and if, as is possible, larger transfers have to be effected as the result of the London debt agreements”.

Nevertheless, in subsequent months this concern was fully removed. The [Report of January 1954](#) (p. 23) comments that “The progressive improvement of the balance of payments position has made it possible for the German Federal Republic by degrees to remove, in many individual fields, the exchange restrictions which still applied, and thereby to approach appreciably nearer to the goal of DM convertibility. As the principal aspect of this process, once the required condition had been created through the coming into force of the London Debts Agreement on 16 September, 1953 relaxations of transfer have been increasingly extended to cover income on capital, as well as payments in connection with capital claims in general” (see also the [Annual report of 1958](#)). In figure 5, we show the expansion of German bilateral trade (as measured by the German exports) after August 1953 in the EPU countries, Sterling countries and the USA or Canada. Although the LDA was already signed by February 1953, ratification by the German government only arrived in August 1953. Here, Abs commented that when the LDA was launched, “the terms of payment in foreign trade changed [and] there was a growing willingness from foreign countries to grant trade credits for foreign trade” ([Abs 1991](#), 251). It is relatively clear that trade expanded more quickly with dollar-based entities, thus boosting Germany’s ability to re-pay remaining claims as per the LDA. Interestingly, using the data from the monthly reports of the Deutsche Bundesbank, we can also compare trade in Europe, Latin America, Asia, and Africa with local currency and with dollars. In all the cases, trade with dollars accelerated after August 1953 while trade in local currencies declined or remained constant.

Similar to equation (1), in table 4 we run a DiD model with German bilateral trade data for different countries and currency unions, using monthly data on exports from the monthly reports of the Deutsche Bundesbank from September 1951 to December 1955.¹⁹ In the models, we use year and category fixed effects and monthly dummies to deal with “seasonality” of the monthly trade statistics. Since we want to look at policies aimed at earning more dollars (rather than just which countries are growing faster) we also control for country demand with a dummy variables for the interaction of country and month

¹⁹ We start our analysis in September 1951 because this is the first month that trade statistics at the monthly level and for different currency areas start to be consistently recorded in the reports of the Deutsche Bundesbank. We tested the robustness of the models to alternative baselines, variously selecting different time points between September 1951 and July 1953 and ending between August 1953 and December 1955, and found none of the main results differed.

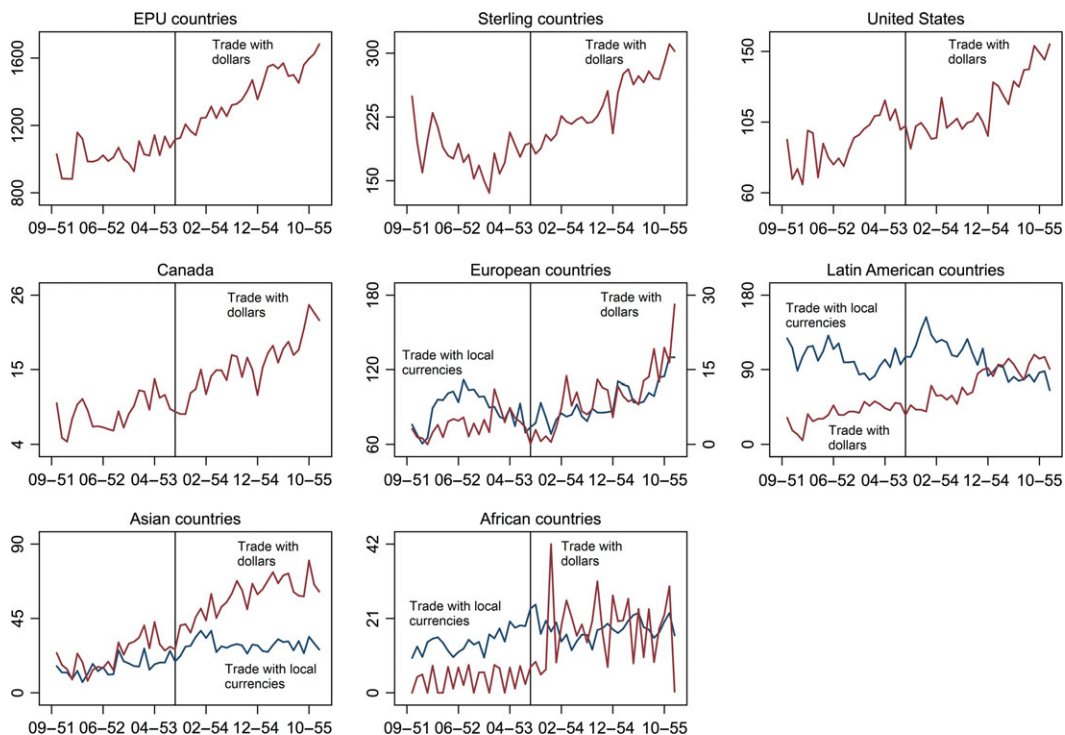


Figure 5. “De-Seasonalized” German bilateral trade with main currency areas, September 1951–December 1955.

Sources: Data from [Jordà, Schularick, and Taylor \(2017\)](#).

Notes: Monetary units in millions of DM. The vertical line indicates the month of August 1953.

indicators. In the treatment group, we use the trade areas of EPU countries, Dollar countries and Sterling countries and in the control group Latin American countries, Eastern European countries (outside the EPU system) along with African and Asian countries. The indicator for pre-LDA runs from September 1951 to August 1953 and the post-LDA from September 1953 until December 1955. Clearly, along with the rapid expansion of exports described in the monthly reports of the Deutsche Bundesbank and elsewhere ([De Long and Eichengreen 1993](#); [Bordo 1993a](#)), we consistently see that trade with foreign countries increased more rapidly just after August 1953 with respect to countries that would increase Germany’s US-\$ reserves. This is particularly true for the EPU countries with the clearing mechanism and directly with dollar countries (mainly the USA).

Regarding the role of the LDA in stabilising the German finances, it is particularly interesting to follow the discussion made by [Eichengreen and Ritschl \(2009, 213–214\)](#) comparing the causes and mechanisms of the recovery of Britain and Germany after WW2. With regard to the mechanisms of recovery, they distinguish the important role of the LDA for the stabilization of the German finances: “private savings rates were actually quite similar in the two countries. Moreover, in both countries public sector’s contribution to national saving was positive. Both countries were capital exporters. The question therefore is how two such similar patterns could have produced such different outcomes. The answer is less different post-war

Table 4. *Differential effects using German bilateral trade with EPU countries, Dollar countries and Sterling countries as the treated group and other countries as the control group*

Currency trade areas	Pre-LDA	Post-LDA	DiD
EPU countries	1,018.1	1,400.5	370.4
Non-EPU, Sterling & Dollar countries	45.5	51.5	(3.0)
Diff (T-C)	972.6 (17.1)	1,349.0 (38.0)	0.000*** [122.1]
Dollar countries	165.9	296.5	123.5
Non-EPU, Sterling & Dollar countries	45.6	51.5	(3.0)
Diff (T-C)	120.3 (8.3)	245.0 (12.9)	0.000*** [40.7]
Sterling countries	182.7	243.5	53.3
Non-EPU, Sterling & Dollar countries	45.5	51.5	(3.0)
Diff (T-C)	137.2 (7.6)	192.1 (9.2)	0.000*** [17.6]
Number of observations	312	312	312
Seasonal adjustment	—	—	Yes
Country demand adjustment	—	—	Yes
Year fixed effects	—	—	Yes
Category fixed effects	—	—	Yes

Source: Data collected from the monthly reports of the Deutsche Bundesbank (several issues) and data originally from the German Federal Statistical Office.

Notes: The dependent variable is the bilateral trade with any of the following currency unions: EPU countries, Dollar countries and Sterling countries. “All other countries” in the control group include a group for Latin American countries, another for Eastern European countries (and European countries outside the EPU system), African countries and Asian countries. We use monthly data and the pre-LDA period is from September 1951 to August 1953, and the post-LDA period is September 1953–December 1955. In the equations, we eliminate seasonality for German exports with monthly time dummies. The results without fixed effects and for subsamples are also statistically significant at the 10 percent level. Additional information regarding the data reported in the monthly reports of the Deutsche Bundesbank are the following: The Figures of Germany include West Berlin. The figures show total exports to consumer countries. Data for EPU countries include overseas territories as appropriate, data for the UK include data from members and non-members of the OEEC and in such case, these EPU countries (non-member countries which, according to the list of OEEC countries, do not belong to the Sterling area) account in pounds sterling. Means and standard errors are estimated by linear regression. Robust standard errors clustered on currency trade areas are in parentheses. *P*-values are immediately below the standard errors and robust *t*-statistics are in brackets, *** $P < 0.01$; ** $P < 0.05$; * $P < 0.1$.

policies than different financial inheritances—specifically, very different debt/income ratios ... Different levels of debt meant different balance-of-payments positions, given similar savings rates. The British balance of payments was weak owing to the large amount of service due on debt to foreigners, while the German balance of payments benefited from the country’s debts having been written down by the currency reform of 1948 and the London Agreement of 1953”. Important for our argument, they continue by saying that “thus, the main difference lay in postwar debt arrangements which favored Germany, allowing her to accumulate foreign currency reserves despite savings rates only marginally different from Britain’s. And that accumulation of reserves freed macroeconomic policy from the constraint imposed by the balance of payments... In Germany, where pressing foreign exchange constraints were absent, one might expect more stable fiscal policy”.

3.3 Benefit 3: stabilising inflation

A final major economic benefit was to stabilise inflation. Bordo (1993a, 54) explains that “Relatively rapid growth (especially of exports) and relatively slow underlying inflation produced a series of current account surpluses and reserve inflows throughout the 1950s” Similarly, Lindlar and Holtfrerich (1997:243) discuss that “a lower rate of inflation than abroad and a surplus on the current account have been among the most important macro-economic goals in Germany”. While Germany started to reduce its inflation after WW2 through monetary reform, the debt relief and the restoration of the financial stability was accompanied by stable inflation fuelling trade (De Long and Eichengreen 1993).

A comparison using the CPI data from Mitchell (2007) between Germany and other European economies in figure 6, shows that post-1933 price stabilization only occurred largely in Germany as the growth rate of a CPI in Germany was among the lowest in European economies (before 1953 inflation in Germany was among the highest in Europe), and well until the 1970s inflation in Germany grew at much lower rates than in other modern economies. This did not happen in the pre-1953 years and it has also been already discussed by historians: “the rate of inflation in Germany, measured by the consumer price index or the GDP deflator, was lower than in a number of competitor countries” (Lindlar and Holtfrerich 1997, 236). Obviously the roots and causes of German policy towards inflation are much more complex, however, it is likely that debt relief provided a boost for the goal of stable inflation.

There was a strong desire from the Allied powers to link repayment with Germany’s ability to grow, to lessen any inflation process where Germany could cover its debt without upsetting its current balance of payments, in which “the export surpluses became the main motor of non-inflationary economic growth” (Frowen and Karakitsos 2001, 163). Indeed, Germany’s transfer capacity linked to low inflation was one of the worries of the design of the LDA during the early discussion. In July 1951, the Three Power Commission drafted a document on *The Question of Germany’s Capacity to Pay* for the London Preliminary Conference. They prudently observed that “Germany’s ability to pay depends not only on the ability of private and governmental debtors to raise the necessary amounts in DM

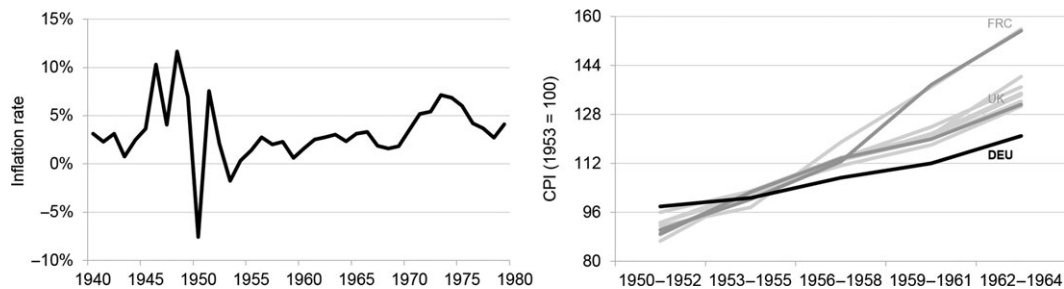


Figure 6. Consumer price inflation in Germany, 1940–1989.

Sources: German consumer price inflation from 1940 to 1989 (left figure) from Piketty and Zucman (2014, Table DE15a) and CPI data (1953 = 100) (right figure) from Mitchell (2007), Table H2.

Notes: The right figure includes data from the following countries: Austria, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, and the UK (in light grey).

Table 5. Differential effects regressions for the natural logarithm of CPI across Western countries, 1946–1969

	(1)	(2)	(3)	(4)
CPI x Post-LDA	-0.221 (0.052) 0.001*** [-4.23]	-0.221 (0.085) 0.010*** [2.59]	-0.221 0.052 0.001*** [-4.23]	-0.212 0.057 0.003*** [-3.76]
Number of observations	408	408	408	312
All countries	Yes	Yes	Yes	No
European countries	No	No	No	Yes
Bootstrapping SE	No	Yes	No	No
Year fixed effects	No	No	Yes	Yes
Country fixed effects	No	No	Yes	Yes

Source: Data are from [Jordà, Schularick, and Taylor \(2017\)](#).

Notes: Dependent variable is the natural logarithm of the consumer price index (CPI). We use data from 1946 to 1969 for the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the USA. In the European sample, we excluded Australia, Canada, Japan, and the USA. We use the log of the CPI data instead of the log of the inflation rate to account for negative values. Robust standard errors clustered at the country level are in parentheses. To account for potential sample bias estimates in column 1, we bootstrapped standard errors in column 2. *P*-values are immediately below the robust standard errors. Robust *t*-statistics are in brackets, ****P* < 0.01; ***P* < 0.05; **P* < 0.1.

without inflationary consequences, but also on the ability of the national economy to cover the debts out of the current trade surplus” (seen in [Kaiser 2013](#)). This was part of the LDA design, as lower inflation gave German exports a more favourable market position than that held by many of their competitors.

In table 5 we also run a DiD model with the natural logarithm of the CPI across western countries between 1946 and 1969. Results suggest, not surprisingly, that the log of the CPI grew much more slowly after 1953 relative to other countries. All coefficients are negative and statistically significant showing lower inflation rates in Germany. Indeed, results are consistent with a bootstrapping of the standard errors, year and country fixed effects, and a subsample strategy of European countries (removing non-European countries such as the USA or Canada).

In principle, it is also possible that the stabilisation of inflation in 1953 rather than in 1950 or before was due to the outbreak of the Korean War (1950–1953), and under the counterfactual of no war, stabilization would have occurred three years before the LDA and not in 1953. However, the impact of the Korean War on German finances has been highly debated. Temin and others argue that in the USA “The Korean War inflation was mild because price controls were instituted and because the demand stimulus was small” and in Germany “any stimulus from an exogenous rise in the demand for German exports at the start of the Korean War was both tiny and short-lived” ([Temin 1995](#), 741–742).

4. Discussion

The LDA, designed over 60 years ago by the Allied forces and market participants together with Germany, eliminated roughly half of the principal of accumulated German pre-war

and post-war debt. This plan, the LDA, formed a sort of sequel to a broad range of measures for European and German economic recovery, first formally articulated in the Marshall Plan, which recognised the need for a satisfactory arrangement on German debt due to its poor history of debt repayment. [Ritschl \(2012\)](#) also considers that “the financial core of the Marshall Plan was something much bigger, an enormous sovereign debt relief programme” that “perpetuated these arrangements, and thus waterproofed them for the days when Marshall Aid would be repaid and the European Payments Union would be dissolved”.

Our analysis provides evidence consistent with the idea that the LDA contributed to accelerating economic growth, by freeing resources for domestic investment and stabilising German finances. The LDA helped pave the way for the “Wirtschaftswunder” or “The Miracle on the Rhine”.

This analysis has several limitations. While we can account for the proximate fiscal transformation that accompanied the LDA, it is more difficult to precisely quantify the impact on overall economic growth. The German economy was already growing between 1950 and 1952 at a historically remarkable annual growth rate of 8 percent. It is difficult to envisage whether the conditions for restructuring debts would have been the same without initial signs of recovery from Germany. Indeed, since debt restructuring was tied to the Marshall Plan and formed part of a broad range of measures for European recovery, it is difficult to see the success of the LDA without the preconditions that created the currency reform of 1948 and the creation of the European Payments Union.

For understanding policy making, the LDA may have implications for contemporary management of debt. In 2012, the Greek Prime Minister, Alexis Tsipras, called for similar relief of Greek debt, receiving much media attention. However, arguably, the historical analogy has at least two major political-economy differences. One is that Germany’s debt crisis arose in the context of two massively destructive World Wars, with 60–80 million military and civilian casualties and devastated infrastructure. Germany also represented 15.4 percent of the Western European population in 1953 compared with indebted nations such as Greece today, with 2.1 percent. Moreover, Germany was an important ally in the Cold War and the American-led fight against the expansion of the Soviet Union.

Nevertheless, what the LDA shows is that debt relief can help stimulate growth and provide the foundations for more equitable fiscal outcomes. In fact creditors received a substantial amount of their money back by linking the repayment of rescheduled debts to Germany’s ability to grow. The debt restructuring proved to be a success and while there had been a problem of debt just prior to 1953, a decade later there was none. Moreover, it is not the mere relief applied to the German finances that demands our attention, but the philosophy of the agreement, namely, “to make a contribution to the development of a prosperous community of nations” ([The agreement on German external debts 1953](#), B3).

The conditions imposed by creditor countries in recent years, with harsher conditions and through giving new loans, could not be more different. Today, countries that borrowed money from the IMF had significantly harsher conditions for repayment. While in the LDA debt repayments were limited to 3 percent of the value of annual exports, in 2013 the IMF defined repayment/export ratios as “sustainable ones” at much higher rates, above 15 percent–20 percent in the Caribbean (15.8 percent in St. Vincent and the Grenadines, 16.8 percent in Grenada and 25.9 percent in Jamaica) and Latin America (28.2 percent Brazil, 20.8 percent Costa Rica and 17.1 percent El Salvador). Even higher debt burdens are observed in Eastern Europe, in Ukraine (42.3 percent), Montenegro (17.5 percent), and

Armenia (46.4 percent), while in African countries illustrative figures are: 15.3 percent Morocco and 13.7 percent Burundi.²⁰

Finally, in assessing post-war German debt relief, we must disentangle the political motivations (in particular, those pertaining to foreign policy) from the goals. Even if we were to ascribe the most cynical and instrumental motivations to the LDA of 1953 (namely, the need for a strong Germany in the context of the Cold War of the 1950s, in addition to the realisation of the errors of the Versailles Peace Conference and their subsequent effects), it is clear that this debt relief was emphatically designed to help Germany grow and always prioritised German economic health over the repayment of the debt. This involved significant sacrifices by creditors (in the form of renouncing a significant part of their debt), but also the implementation of mechanisms to avoid any risk of causing the German economy to stagnate with the burden of debt repayments. It is in this respect that the contrast is most striking with the recent and current policies in relation to the Southern Eurozone countries. We might readily accept that the foreign policy motivations of Germany and other European countries in the late 2000s and early 2010s are very different from those of the USA and its allies in the 1950s, but the fact remains that the programme designed to restore the finances of heavily indebted Eurozone countries had a conspicuously different goal, one that prioritised the repayment of the debt and economic reform (by way of austerity measures) over the rehabilitation of the affected economies via significant reductions in debt. By revisiting the 1953 LDA and its subsequent effects, we can see a much clearer image of the impact of policies (including their motivations and objectives) that were developed to manage the financial crisis in the Eurozone.

Supplementary material

Supplementary material is available at *European Review of Economic History* online.

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References

- ABADIE, A., DIAMOND, A. and HAINMUELLER, J. (2010). Synthetic control methods for comparative case studies: estimating the effect of California's tobacco control program. *Journal of the American Statistical Association* **105**(490), pp. 493–505.
- ABS, H.J. (1991). *Entscheidungen 1949–1953: Die Entstehung des Londoner Schuldenabkommens*. Mainz: von Haese und Kohler.
- ANDIC, S. and VEVERKA, J. (1963). The growth of government expenditure in Germany since the unification. *Public Finance Analysis* **23**(2), pp. 169–278.

²⁰ The debt service ratio defined by the IMF is the ratio between the total debt service as percentage of exports of goods, services and primary income. Data from the World Bank (<http://data.worldbank.org/indicator/>).

- BERGER, H. and RITSCHL, A. (1995). Germany and the political economy of the Marshall Plan, 1947–1952: a re-revisionist view. In EICHENGREEN B. (ed.), *Europe's Postwar Recovery*. Cambridge: Cambridge University Press, pp. 199–245.
- BORDO, M.D. (1993a). The Bretton Woods International Monetary System: a historical overview. In BORDO M.D. and EICHENGREEN B. (eds.), *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*. Chicago: University of Chicago Press, pp. 3–108.
- BORDO, M.D. (1993b). The Gold Standard, Bretton Woods and other Monetary Regimes: An Historical Appraisal. NBER Working Paper 4,310.
- BORDO, M.D., EICHENGREEN, B. and IRWIN, D.A. (1999). Is Globalization Today Really Different than Globalization a Hundred Years Ago? NBER Working Paper 7,195.
- BROADBERRY, S. (1997). Anglo-German productivity differences, 1870–1990. *European Review of Economic History* 1(2), pp. 247–67.
- BUCHHEIM, C. (1990). *Die Wiedereingliederung Westdeutschlands in die Weltwirtschaft 1945–1958*. Oldenbourg.
- DE LONG, B. and EICHENGREEN, B. (1991). The Marshall Plan as a Structural Adjustment Program. Unpublished Manuscript.
- DE LONG, J. and EICHENGREEN, B. (1993). The Marshall Plan: history's most successful structural adjustment program. In DORNBUSCH R., NOLLING, W. and LAYARD, R. (eds.), *Postwar economic reconstruction and lessons for the east today*. Cambridge: MIT Press, pp. 189–230.
- DERNBURG, H.J. (1953). Some basic aspects of the German debt settlement. *The Journal of Finance* 8(3), pp. 298–318.
- DERNBURG, H.J. (1954). Germany's external economic position. *The American Economic Review* 44(4), pp. 530–58.
- Deutsche Bundesbank. 1953. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1954. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1957. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1958. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1959. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1960. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1961. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1963. German external debts under the London Agreements. Monthly Report of the Deutsche Bundesbank.
- Deutsche Bundesbank. 1964. German external indebtedness, March 1964. Monthly Report of the Deutsche Bundesbank.
- DIEFENDORF, J.M., FROHN, A. and RUIEPER, H.-J. (1993). *American Policy and the Reconstruction of West Germany, 1945–1955*. Cambridge: Cambridge University Press.
- DORNBUSCH, R., NOLLING, W. and LAYARD, R. (1993). *Postwar Economic Reconstruction and Lessons for the East Today*. Cambridge: MIT Press.
- EICHENGREEN, B. (1993). *Reconstructing Europe's Trade and Payments: The European Payments Union*. Manchester: Manchester University Press.
- EICHENGREEN, B. (1995). Mainsprings of economic recovery in post-war Europe. In EICHENGREEN B. (ed.), *Europe's Post-War Recovery*. Cambridge: Cambridge University Press, pp. 3–35.
- EICHENGREEN, B. (1996). Institutions and economic growth: Europe after World War II. In CRAFTS N. and TONIOLO G. (eds.), *Economic Growth in Europe since 1945*. Cambridge: Cambridge University Press, pp. 38–70.

- EICHENGREEN, B. (2010). Lessons from the Marshall Plan. World Development Report 2011.
- EICHENGREEN, B. and RITSCHL, A. (2009). Understanding West German economic growth in the 1950s. *Cliometrica* 3, pp. 191–219.
- FELDMAN, G.D. (2005). The reparations debate. *Diplomacy and Statecraft* 16, pp. 487–98.
- FLORA, P. (1983). *State, Economy and Society in Western Europe, 1815–1975*. New York: Macmillan Press.
- FROWEN, S.F. and KARAKITSOS, E. (2001). The fate of key currencies: a strategic approach. In HÖLSCHER J. (ed.), *Fifty Years of the German Mark: Essays in Honour of Stephen F. Frowen*. New York: Palgrave, pp. 159–82.
- GIERSCH, H., PAQUE, K.-H. and SCHMIEDING, H. (1992). *The Fading Miracle: Four Decades of Market Economy in Germany*. Cambridge: Cambridge University Press.
- GLASEMANN, H.-G. (1993). *Deutschlands Auslandsanleihen 1924–1945. Rückzahlungen nach der Wiedervereinigung von 1990*. Wiesbaden: Springer.
- GUINNANE, T.W. (2005). German debt in the twentieth century. In GOETZMANN W.N. and ROUWENHORST K.G. (eds.), *The Origins of Value: The Financial Innovations that Created Modern Capital Markets*. Oxford: Oxford University Press, pp. 327–42.
- GUINNANE, T.W. (2014). Financial *Vergangenheitsbewältigung*: the 1953 London Debt Agreement. *Bankhistorisches Archiv* 40(1–2), pp. 75–102.
- GUINNANE, T.W. (2015). Financial *Vergangenheitsbewältigung*: the 1953 London Debt Agreement. University Yale Working Paper 880.
- HOCKERTS, H.G. (1977). Sozialpolitische Reformbestrebungen in der frühen Bundesrepublik. Zur Sozialreform Diskussion und Rentengesetzgebung 1953–1957. *Vierteljahrshefte für Zeitgeschichte* 25(3), pp. 341–72.
- JAMES, H. (1986). *The German Slump: Politics and Economics 1924–1936*. Oxford: Oxford University Press.
- JANOSSY, F. (1969). *The End of the Economic Miracle*. New York: ISAP.
- JORDÀ, Ó., SCHULARICK, M. and TAYLOR, A.M. (2017). Macrofinancial History and the New Business Cycle Facts. (<http://www.macrohistory.net>).
- KAISER, J. (2013). One made it out of the debt trap. Lessons from the London Debt Agreement of 1953 for current debt crises. International Policy Analysis Friedrich Ebert-Stiftung.
- KAPLAN, J. and SCHLEIMINGER, G. (1989). *The European Payments Union: Financial Diplomacy in the 1950s*. Oxford: Clarendon Press.
- KEYNES, J.M. (1920). *The Economic Consequences of the Peace*. London: MacMillan Press.
- KRUGMAN, P. (1988). Financing versus forgiving a debt overhang. *Journal of Development Economics* 29, pp. 253–68.
- LEAMAN, J. (1988). *The Political Economy of West Germany, 1945–1985*. London: MacMillan Press.
- LINDERT, P. (2013). Europe Expenditure series. (<http://gpih.ucdavis.edu/Government.htm>).
- LINDLAR, L. and HOLTFRERICH, C.-L. (1997). Geography, exchange rates and trade structures: Germany's export performance since the 1950s. *European Review of Economic History* 1, pp. 217–46.
- LUTZ, F.A. (1949). The German currency reform and the revival of the German economy. *Economica* 16(62), pp. 122–42.
- MITCHELL, B. (2007). *International historical statistics 1750–2005: Europe*. Palgrave MacMillan Press.
- PIKETTY, T. (2014). *Capital in the Twenty-First Century*. Cambridge: Harvard University Press.
- PIKETTY, T. and ZUCMAN, G. (2014). Capital is back: wealth-income ratios in rich countries, 1700–2010. *Quarterly Journal of Economics* 129(3), pp. 1255–1310. Data Appendix.
- RAHLF, T. 2015. German Time Series Dataset, 1834–2012. Figshare.
- REINHART, C., REINHART, V. and ROGOFF, K. (2015). Dealing with debt. *Journal of International Economics* 61(S1), pp. 43–55.
- REINHART, C.M. and TREBESCH, C. (2016). Sovereign debt relief and its aftermath. *Journal of the European Economic Association* 14(1), pp. 215–51.
- RITSCHL, A. (1996). Sustainability of high public debt: what the historical record shows. *Swedish Economic Policy Review* 3, pp. 175–98.

- RITSCHL, A. (2011). Germany owes Greece a Debt. *The Guardian*. Tuesday 21 June 2011.
- RITSCHL, A. (2012). Germany, Greece and the Marshall Plan. *The Economist*. Friday 15 June.
- RITSCHL, A. (2014). Calling Germany on its Hypocrisy in the Eurozone debt crisis. LSE Report.
- ROMBECK-JASCHINSKI, U. (2005). *Das Londoner Schuldenabkommen: Die Regelung Der Deutschen Auslandsschulden Nach Dem Zweiten Weltkrieg*. Oldenbourg.
- SACHS, J. (1999). Implementing Debt Relief for the HIPCs. University Harvard Working Paper.
- SACHS, J. (2015). Let Greece Profit from German History. *The Guardian*. Wednesday 21 January 2015.
- SACHS, J.D. and WARNER, A. (1995). Economic Reform and the Process of Global Integration. *Brookings Papers on Economic Activity*.
- SCHWARZ, H.-P. (1991). *Konrad Adenauer: A German Politician and Statesman in a Period of War, Revolution and Reconstruction*. Oxford: Berghahn Books.
- STOLPER, W.F. and ROSKAMP, K.W. (1979). Planning a free economy: Germany 1945–1960. *Journal of Institutional and Theoretical Economics* **135**(3), pp. 374–404.
- STRECKE, T. (2006). *Der Lastenausgleich in der Bundesrepublik Deutschland*. Universität Münster. Die Bedeutung Wimars und die Grundlagen der BR von 1949.
- TEMIN, P. (1995). The ‘Koreaboom’ in West Germany: fact or fiction? *The Economic History Review* **48**(4), pp. 737–53.
- TEMIN, P. (2002). The golden age of European growth reconsidered. *European Review of Economic History* **6**(1), pp. 3–22.
- The Agreement on German External Debts. (1953). *The Agreement on German External Debts*. Treaty Series No. 7 (1959). London: Her Majesty’s Stationary Office.
- The Economist. 7 March 1953. Last Stage for German Debts. p. 664.
- The Economist. 2 May 1953. Dr Adenauer’s Party. p. 313.
- The Economist. 7 February 1953. Germany Cuts Its Taxes. pp. 366–7.
- The Economist. 16 August 1952. Germany’s PreWar Debts. pp. 408–9.
- The New York Times. 18 August 1953, p. 13.
- THOMA, M. (1962). Lasterausgleich. In T. MANN and G. PÜTTNER (eds), *Handbuch der kommunalen Wissenschaft und Praxis*. Berlin: Springer.
- TOOZE, A. (2011). Reassessing the moral economy of post-war reconstruction: the terms of the West German settlement in 1952. *Past and Present Supplement* **6**(210), pp. 47–70.
- VONYÓ, T. (2008). Post-war reconstruction and the golden age of economic growth. *European Review of Economic History* **12**(2), pp. 221–41.
- VONYÓ, T. (2018). *The Economic Consequences of the War: West Germany’s Growth Miracle after 1945*. Cambridge: Cambridge University Press.
- WEITZEL, O. (1967). Die Entwicklung der Staatsausgaben in Deutschland. Eine Analyse der öffentlichen Aktivität in ihrer Abhängigkeit vom wirtschaftlichen Wachstum. Dataset from the Friedrich-Alexander-Universität Erlangen-Nürnberg.