Reconstruction Dynamics: The Impact of World War II on Post-War Economic Growth

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Abstract

The decades that followed the end of World War II are commonly referred to as the golden age of economic growth as they were marked by the highest growth rates that the world economy has witnessed to this date. This temporal sequence raises the natural question of whether and to what extent these growth rates were the outcome of a prolonged reconstruction process that began after the end of the war. We revisit this important question by investigating the impact of the post-war output gap on the subsequent growth experiences of different countries in different regions of the world and by using a novel instrumental variables approach to establish causality. Our results show that this reconstruction process was an important driver of growth during the post-war decades, not only in Europe but globally, and its impact on growth rates lasted until the mid 1970s. Moreover, a counterfactual analysis suggests that in the absence of the reconstruction effect global growth rates from 1950 to 1975 would have been on average 40% lower and only slightly higher than those observed during the years from 1975 to 2000.

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1 Introduction

The modern theory of economic growth is closely associated with the post-war era. Both neo-classical (Solow, 1956; Cass, 1965; Koopmans, 1965) and endogenous growth models (Romer, 1986, 1990; Lucas, 1988; Aghion & Howitt, 1992) were essentially developed to account for the growth experience of developed and developing economies during this period. Similarly, most empirical research on comparative growth performance, from the pioneers (Denison, 1967; Maddison, 1982), through the seminal contributions on cross-country convergence (Baumol, 1986; Dowrick & Nguyen, 1989; Barro, 1991; Mankiw, Romer & Weil, 1992), has been conducted using harmonized cross-country data from the end of World War II and onwards.

Yet, besides marking the start of this era, the impact of World War II on subsequent growth patterns is largely overlooked in most theoretical and empirical investigations. This notable omission naturally raises a set of important questions. Were the high rates of economic growth observed during this period the result of a process of reconstruction and economic reorganization that followed the most destructive armed conflict in human history? If so, for how long did this process last after the cessation of hostilities, which regions of the world did it affect, and how important was it compared to other factors that influenced growth over this period? Our aim in the present paper is to systematically address exactly these questions.

The notion of reconstruction dynamics positively influencing economic growth in the aftermath of large destructive events is not a new one. In fact, it even predates World War II. In his *Principles of Political Economy*, John Stuart Mill already described the *vix mediatrix naturae*, the healing power of nature, that lifts nations out of their devastation and restores them into their normal conditions. Economists in the post-war era, including Milton Friedman, remarked on this phenomenon, claiming that the wartime dislocation of economies can give rise to high growth rates, reaching eight to ten per cent annually (Klein, 1961). It was, however, Ferenc Jánossy who formalized this notion in order to explain the growth miracles of the post-war era. His reconstruction thesis, as it is commonly referred to, argues that war-shattered economies can sustain high rates of economic growth for a long period of time without running into diminishing returns while returning to their long-run growth trajectory. This happens in a quasi-automatic process that is set into motion once economic activity resumes its natural course.

According to Jánossy (1969, p.233-234), beyond large destruction of production factors, the war caused serious distortions in the allocation of factor endowments across economic sectors. This situation, termed structural incongruence, represents a unique potential source of growth. Subsequent investment and organizational efforts aimed at restoring the structural balance, i.e. reducing the disproportion and misallocation of complementary factors of production, are bound to generate fast growth. This fast growth, in Jánossy's view though, is not simply the result of temporarily higher returns to capital accumulation, which gradually decrease as the economy returns to its long-run growth trajectory. It is the result of an inherently structural process

related to the reorganization of economic activity and the reallocation of production factors that needs to take place in each war-affected economy.

German historians were the first to introduce the Jánossy thesis into western economic history (Manz, 1968; Abelshauser, 1975, 1983; Borchardt, 1991), and since then the relevance of his analysis for post-war growth has been recognized internationally (Crafts & Toniolo, 1996). Several cliometric studies have provided evidence for strong reconstruction dynamics in the post-1950 period (Dumke, 1990; Wolff, 1995; Smolny, 2000; Temin, 2002; Vonyo, 2008). As a result of this line of research there is some consensus that the relative growth performance after 1950 was significantly affected by the differential impact of the war on economic activity across countries.

However, these studies suffer from important data and econometric limitations. They focus mostly on the experience of European countries. This begs the question of whether the observed reconstruction dynamics were an idiosyncratically European phenomenon or not. Moreover, their results are based largely on simple OLS regressions, while their findings are inconclusive on both the size and the persistence of the estimated reconstruction effect. This raises important concerns about the identification of this effect, as the hitherto employed measures of the post-war output gap may not have been completely exogenous to other factors that determined the long-run growth potential of different economies.

To address these concerns, we propose a revised approach that provides for a more accurate account of the contribution of reconstruction dynamics to post-war growth. Our starting point is that World War II was not merely an episode of European history but a global phenomenon with profound differential impact on the world economy. Some regions were shattered by the hostilities, while others received a huge economic boost from the armaments trade and the increased global demand for raw materials that were critical for the war effort. With that in mind, we conduct our analysis using a large global sample of countries representing different regions of the world. We compute post-war output gaps for the largest possible set of countries based on the GDP data from the Maddison Project. We do so by extrapolating for each country per capita GDP levels from the pre-war output trends and measuring the proportional difference between the actual and projected levels after the end of the war. We can quantify, thus, across countries the size of both the negative output gaps due war destruction and the positive output gaps due wartime economic booms. These post-war output gaps are then included as explanatory variables in otherwise standard cross-country growth regressions, which we estimate using both cross-sectional and panel specifications.

In the context of the cross-sectional regressions we focus on the average annual rates of growth over the three decades from 1950 to 1980. Using a variety of specifications and conditioning on all the standard growth determinants, we find evidence for strong and significant reconstruction dynamics. The size of the post-war output gap appears to have had a large negative and statistically significant effect on subsequent growth rates. This implies that countries that had

suffered large negative output shocks because of World War II grew systematically faster during the subsequent decades. Moreover, this finding appears in different regional samples of countries, meaning that reconstruction dynamics were a global phenomenon and were not specific to Europe.

To ensure the proper identification of the impact of reconstruction on post-war growth rates, we employ an instrumental variables approach. This allows us to isolate the reconstruction effect from other potential confounding factors that may have played a role in determining the post-war growth experiences of different countries. In particular, the negative relationship between post-war output gaps and subsequent growth rates might naturally arise as a concomitant of the fact that most belligerents were relatively developed countries that had already industrialized before World War II. These countries may have experienced high growth rates and large negative output gaps in the post-war period due to unobserved characteristics that shaped their long-run development trajectories. In such cases, the estimated coefficient on the output gap is bound to give a biased estimate of the contribution of reconstruction dynamics to post-war growth.

Our approach to account for this potential endogeneity and to isolate the reconstruction effect from other drivers of growth is to exploit the differential proximity of individual countries to the main World-War-II battlefronts. This idea draws on a growing literature that uses exogenous geographic variation to assess the differential impact of historical events.[1] Specifically we employ the distance between each country's capital and the closest location of a major World War II battle as an instrument for the country's post-war output gap. Following this approach, we still obtain a strong negative relationship between the instrumented post-war output gap and subsequent growth rates with the magnitudes being now higher compared to the OLS results. Based on our instrumental variables regressions results, reconstruction dynamics account for almost all the observed differences in growth rates across countries over the period from 1950 to 1980.

To assess the contribution of post-war reconstruction to economic growth over time, we perform a similar analysis with panel data. In this context we focus on average growth rates over periods of 5 and 10 years from 1950 to 2000, controlling for both country and period fixed effects. This specification allows us to evaluate the statistical significance of the reconstruction effect during each specific time period. Based on this approach we document that reconstruction dynamics had a substantial and statistically significant impact on growth rates until the mid 1970s, much longer than what the majority of previous studies have suggested. Using our period-by-period estimates, we also perform a counterfactual analysis of what global growth rates would have been had World War II not diverted many countries off their long-run growth trajectories. This analysis yields the striking conclusion that the contribution of reconstruction dynamics alone raised the rates of economic growth during the three decades after the end of World War

[1] Subsection 3.2 discusses this literature in greater detail.

II to magnitudes never seen before on a global scale. In the absence of the war-induced shock, global growth rates from 1950 to 1975 would have been on average 40% lower and only slightly higher than those observed during the years from 1975 to 2000.

2 Different Perspectives on Post-War Growth

Our analysis of the role of reconstruction in the aftermath of World War II should be understood as part of the broader literature on post-war economic growth, which has investigated the patterns of growth observed during this period and the processes that can account for them. In the context of this literature conditional convergence is the core component of most interpretations for the fast growth of the golden age years. According to Abramovitz (1986, 1994), this convergence process was driven by technological catch-up conditional upon the presence of adequate "social capabilities for growth" and "technological congruence," while Baumol (1986) suggest the existence of a convergence club that includes Western European nations, Western Offshoots and Japan. Subsequent contributions by growth economists have provided more support for the notions of conditional convergence (Barro, 1991; Mankiw, Romer & Weil, 1992) and club convergence (Quah; 1996, 1997; Ben-David, 1998), while work by economic historians (Crafts & Toniolo, 1996; Broadberry, 1996) has demonstrated that convergence in income between western industrialized nations was much stronger during the early post-war years than in any period before or after.

Yet, post-war growth was not solely the result of fast rates of factor accumulation. Comparative growth accounts for western industrialized nations (Maddison, 1991, 1996; Crafts, 1995; van Ark, 1996; O'Mahony, 1996, 1999) have confirmed that European catch-up from the 1950s to the late 1970s was driven by both capital deepening and high productivity growth. The latter has long been attributed to structural modernization. Denison (1967) was the first to show quantitatively that rapid growth in several European countries was strongly supported by the reallocation of labor from agriculture to manufacturing and modern services. Kaldor (1966) argued that modern growth was driven by industrial expansion, and thus, the growth potential of different economies depended on their capacity to increase the share of industrial employment. Temin (2002) showed that relative growth performance in Western Europe during the golden age reflected substantial differences across countries in the share of agricultural employment at the start of the period. Yet, more recent shift-share analyses has suggested that labor reallocation can only explain a small fraction of the post-war growth miracles of countries like Germany (Sleifer, 2006).

Institutional interpretations have also been influential in explaining the uniqueness of the post-war experience and the sudden growth slowdown experienced by western nations in the mid 1970s. Olson (1982) postulated that stable democracies were eventually doomed to experience

a slowdown of economic growth because "distributional coalitions," such as craft trade unions, would gradually undermine the efficient functioning of markets through the misallocation of resources and income. He saw the mainsprings of post-war supergrowth for the defeated powers in the demolition of distributional coalitions either by the totalitarian regimes before 1945 or by the Allied occupation forces after. Going beyond the case of Germany, Japan and Italy, Eichengreen (1996, 2008) offered a more elaborate institutional explanation for the persistence of high growth rates in post-war Europe. He argued that economic development is conditioned by the social contract between employees and employers on how to redistribute profits between labor and capital, a contract which is undermined by the time inconsistency of optimal plans. Workers have no incentive to support wage moderation if they are not certain that firms will reinvest their profits, while firms have little incentive to reinvest profits if they are not sure that unions will accept wage moderation in return. According to Eichengreen, the institutional reforms of the early post-war era and, in particular, the enhanced role of governments in industrial relations created a novel contract-enforcement mechanism forcing social partners to abide by their commitments.[2] This, together with international trade liberalization and the avoidance of competitive devaluations thanks to the Bretton-Woods regime, was instrumental in the growth-conducive equilibrium that characterized most western nations during the golden age.

However persuasive, institutional accounts on the post-war golden age have found little support in the historical literature. Recent contributions, particularly on post-war Germany, demonstrated that World War II did not represent a *tabula rasa* in the evolution of the political, social and economic institutions. Trade unions and industrial organizations managed to regroup very shortly after the war and their influence was substantially weaker compared to the interwar period. The evolution of institutions in belligerent nations showed more signs of continuity than discontinuity, and minor differences in the scale and characteristics of distributional coalitions across countries cannot account for the large variance in growth rates among western industrialized nations in the 1950s and 1960s (Paqué, 1995, 1996; Ritschl, 2005).

The need to go beyond structural and institutional explanations of post-war growth has also been suggested by recent growth-accounting exercises. Eichengreen and Ritschl (2009) as well as Ritschl and Vonyó (2014) have shown that capital accumulation accounted for only a fraction of both the sharp decline in output and labor productivity in the German economy after the war and the rapid recovery that began in the late 1940s. Both phenomena reflected above all changes in productivity. This finding is in line with the consensus that emerged in recent historiography over the nature of wartime dislocation. While overall losses in productive assets were far from catastrophic, economic recovery during the immediate post-war years was hindered by a combination of factors that disrupted the chains of production. Bottlenecks in the transport network caused frequent shortages of input materials and energy supplies (Abelshauser, 1975),

[2] Eichengreen referred to this arrangement as a "high investment, high productivity, low wage equilibrium."

the dysfunctional financial system left the defeated economy in a state of 'vegetative control' (Carlin, 1989), the destruction of urban housing led to a temporary shortage of labor in the urban-industrial sector (Vonyo, 2012), and the breaking of trade linkages due to the imposition of new borders after 1945 resulted in severe structural disproportions in post-war economies (Ritschl & Vonyo, 2014). This suggests that alleviating all these constraints was crucial for the reconstruction process and that its impact on growth operated through several channels, not solely through the replacement of destroyed capital.

3 Data and Empirical Strategy

3.1 Measuring Post-War Output Gaps

We begin our analysis by quantifying the output gaps that emerged in different economies around the globe in the aftermath of World War II. This requires information about output levels both before and after the war. For this purpose we employ historical data on per capita GDP from the Maddison Project, which builds upon the original database of Angus Maddison (2001, 2003) and provides the most comprehensive information on income levels before World War II on an annual frequency.[3]

The per capita GDP figures prior to 1939 in the data set cover 73 countries. However, for 16 of them only a few benchmark estimates are available, with no information at all during 1940s. These countries are, therefore, excluded from the analysis, as the size of the post-war output gap can not be accurately quantified. We also adjust the series for Germany based on earlier versions of the data (Maddison, 1995) to have it reflect only West Germany.[4] Thus, our baseline sample, on which we focus our analysis, covers 57 countries. These sample countries are listed in Table 1 and they includes 26 countries from Europe, 17 from the Americas, 13 from Asia, as well as Australia, New Zealand and South Africa.[5]

To capture the potential growth trajectories that each economy would have followed had World War II not occurred we use the following approach. For each country, we calculate the average annual growth rate of GDP per capita over the interwar years (1920-1938), $\bar{g}$. Starting from 1939, we project a path of per capita GDP for all future years based on that growth rate. We then compute the magnitude of the war-induced output gap after 1945 by taking the proportional difference of each country's actual value of per capita GDP from its projected value. Specifically, letting y_{it} denote the actual level of per capita GDP in country i in year t and y^*_{it} denote the

[3] We use the most recently updated version of the data which is described in Bolt and van Zanden (2014) and is available online at: http://www.ggdc.net/maddison/maddison-project/data.htm.

[4] We make this adjustment not only to ensure consistency in the data series, but also because, as pointed out by Sleifer (2006), the reconstruction process in East and West Germany occurred in different fashions.

[5] Our baseline sample may not cover uniformly the whole world, but has a wide geographic coverage that allows us to assess the differential impact of World War II across different countries in different regions of the world.

corresponding projected level and following the standard economic definition, the output gap for country i is given by the formula:

$$Gap_{it} = \frac{y_{it} - y^*_{it}}{y^*_{it}}, \text{ with } y^*_{it} = y^*_{i0}(1 + \bar{g}_i)^t$$

The choice to construct our per capita GDP projections based on growth rates observed between 1920 and 1938 might at first appear arbitrary. After all, the interwar years were a volatile period, as most economies struggled to recover from the large shocks of World War I and the Great Depression. Hence, to ensure robustness, we consider two alternative ways to compute the post-war output gap. The first is to project the path of per capita GDP after 1939 based on growth rates observed during the years before World War I. In particular, we use for each country the average growth rate between 1890 and 1913, a period whose relative stability might better reflect the global macroeconomic environment of the post-war years. The second alternative is to compute the post-war output gap based on the growth trajectories that the countries in our sample would have followed had neither World War I nor the Great Depression occurred. This requires projecting per capita GDP from 1913 levels based on the average annual growth rates observed from 1890 to 1913.

To get a sense of these different growth trajectories Figures 1 and 2 below display them for the cases of France and West Germany, two major European economies heavily affected by war and the turbulence of the interwar years. In both figures, the solid line captures the actual path of GDP per capita and the dashed line demonstrates our baseline potential growth path projected based on interwar growth rates. The dashed-dotted line corresponds to the first alternative path that assumes per capita GDP post 1938 to have grown at the rates observed from 1890 to 1913. Finally, the dotted line shows the second alternative path that assumes per capita GDP post 1913 to have grown at these same pre-World-War-I rates.

The case of France, displayed in Figure 1, is typical of many economies that were below their trends before the start of World War II. For such economies extrapolating potential GDP from pre-1914 trends implies larger the output gaps after 1945 relative to our baseline. Interestingly, though, following the end of the war France recovered to its pre-1913 and interwar trajectories around the same time. This happened in the mid 1960s, almost 15 years after per capita GDP had surpassed its pre-World-War-II level.[6] Subsequently France moved away from the pre-1913 trajectory and followed closer the growth trajectory it had established during the interwar period. A natural interpretation of this pattern is that the pre-World-War-I growth trend fails to capture the structural modernization that took place during the interwar years but was only fully realized in the post-war years.

[6] One could reach a different conclusion based on our first alternative trend line. Yet, this growth trajectory does not seem to capture well the path of GDP, neither before nor after World War I.

[Insert Figure 1 around here]

The case of West Germany, shown is Figure 2, is slightly different, as its economy was quite close to trend on the eve of World War II. Hence, the post-war output gap obtained when extrapolating from either our baseline or the two alternative trajectories are similar. Contrary to France, Germany never recovered to its steep interwar growth trajectory. Actual output came close to this trend in the mid 1970s, but following the growth slowdown after the end of the golden age, it started to move closer to the pre-World-War-I trend, which had already been surpassed by 1968.[7]

[Insert Figure 2 around here]

Gauging the magnitudes of post-war output gaps beyond France and West Germany, Table 1 shows the average values in all countries in our sample between the years 1946 and 1950 calculated using the three distinct ways described above. We focus on the average output gaps over five years to eliminate year-to-year fluctuations due to mismeasurement and business-cycle effects. The first column gives our preferred set of values that are based on the interwar growth rates and are the ones that we primarily use in our econometric analysis. These values are largely negative for most European and East Asian countries that were heavily involved in the war and experienced extensive warfare on their soil. By contrast, countries that stayed out of the war or did not become war zones such as the United States and Canada, went through an economic boom and had positive output gaps.

[Insert Table 1 around here]

These results confirm well-established stylized facts. The notion of ground zero has commonly featured in the economic history of post-war Germany (Roskamp, 1965; Hoffmann, 1965; Kramer, 1991) and many other war-shattered states. In the case of Eastern Europe the introduction of communism was often justified with the need to rebuild the productive capacity that had been destroyed by the war (Janossy, 1969; Berend, 1997). By contrast, the mainstream American literature has long cherished the view that it was only "wartime prosperity" that finally managed to pull the United States economy out of a long depression by restoring full employment and a high level of capacity utilization (Offer, 1987; Hughes, 1990; Walton & Rockoff, 1990).

The second and third columns of Table 1 report alternative output gap values that are based on growth rates that prevailed before 1914. For many countries these values differ substantially from those in the first column, as their pre-1914 development paths were clearly distinct from those they followed after World War I. This is particularly the case for many peripheral economies

[7] As in the case of France, we see again that our first alternative trend line does seem to capture well the evolution of per capita GDP.

that only began to develop in the early decades of the twentieth century and for which the effects of World War I and the Great Depression were only moderate. For these economies the pre-1914 growth rates reflect poorly their modern growth trajectories.

The non-trivial differences between these alternative gap values can be exploited to assess quantitatively alternative hypotheses regarding the nature of the post-war reconstruction process. For example, Jánossy (1969) argued against the extrapolation of pre-1914 output trends to approximate the normal growth paths of European economies in the twentieth century, precisely because these modern growth paths for many peripheral countries were the product of the twentieth century itself. Comparing the strength of the relationship between these alternative values of the post-war output gap and subsequent growth rates allows us to test such hypotheses. This comparison also allows us to assess whether the shock of World War II operated in a distinct or cumulative way relative to the previous shocks of World War I and the Great Depression. This is an additional novel dimension of our analysis compared to previous research on this topic.

3.2 Econometric Specifications

Having obtained estimates of the post-war output gap for a large set of countries, we then employ them in a set of cross-sectional and panel growth regressions. Specifically our approach is to estimate the following two types of regressions:

$$g_i = \beta_0 + \beta_1 lny_i + \beta_2 Gap_i + \gamma' X_i + \varepsilon_i, \tag{1}$$

$$g_{i,t} = \beta_0 + \beta_1 lny_{i,t-1} + \beta_2 Gap_i \cdot \delta_t + \gamma' X_{i,t} + \delta_t + \delta_i + \varepsilon_{i,t}. \tag{2}$$

As above, the subscripts i and t correspond to the country and the period respectively. The dependent variable g is the average annual growth rate of per capita GDP over each period. $\ln y$ denotes the natural logarithm of the initial value of per capita GDP and the *Gap* variable is the initial value of the output gap in country i. In most specifications the latter corresponds to the average value for the years from 1946 and 1950, reported in Table 1. Finally X denotes a vector of control variables that include other potential growth determinants. For most of our specifications these controls include the rate of population growth, the share of investment in GDP, the share of government spending in GDP, the country's degree of openness, a measure of the country's level of human capital and a measure of its quality of institutions.[8]

In the context of the above specifications a negative and significant β_1 coefficient is typically interpreted as evidence of conditional convergence. This means that given the determinants of the steady-state income level and of the long-run growth rate included in X, the current growth rate of an economy is higher the lower is the initial level of income per capita. In simple terms,

[8] In subsection 3.3 we elaborate on how exactly these variables are measured.

growth is higher the further away a country is from its steady state. By adding the *Gap* variable to these specifications we aim to capture the specific effects that deviations from the pre-WW2 output trajectory had on growth rates in each period. In particular a negative and significant β_2 coefficient implies that ceteris paribus countries below their long-run growth trajectory will tend to grow at a faster rate, while countries above that trajectory will tend to grow at a lower rate. Controlling for the initial level of GDP, the coefficient on the GAP variable should capture the specific effect of reconstruction dynamics on growth.

For each of the control variables included in X a significant γ coefficient implies that this variable was an important determinant of growth rates over the period under investigation. This would be because the variable correlates either with the steady-state level of per capita income or with the long-run growth rate of the economy. We select our controls with this logic in mind and following the conventional wisdom in the empirical growth literature. In the context of this literature, studies that built upon the framework of the neoclassical growth model (Mankiw et al., 1992; Islam, 1995) consider rates of population growth, investment in physical capital, and human capital as important determinants of an economy's steady state. There is also extensive work that has established how a country's quality of institutions and the size of its government exert a powerful influence on its growth trajectory, as they determine the efficiency with which the available resources are utilized and the incentives for further accumulation. (Barro & Sala-i-Martin, 1995; Acemoglu, 2008). Finally, multiple empirical studies have documented how the level of openness of the economy is a key factor that facilitates the growth potential of an economy. (Wacziarg and Welch, 2008).

In addition to controlling for the aforementioned growth determinants, in our panel specification we also include country and period fixed effects, denoted by δ_i and δ_t respectively. These fixed effects isolate from the estimated coefficients the influence of time-invariant country-specific factors as well as global time-varying factors that might have influenced the growth performance of each country under consideration. This implies that all coefficients in the panel specification are econometrically identified from observed within-country variation in each respective regressor. To assess the persistence of the reconstruction effect on post-war growth over time, the *Gap* in the panel is interacted with the period fixed effects.

Authors such as Dumke (1990), Smolny (2000), Temin (2002) and Vonyó (2008) have employed similar specifications to quantitatively evaluate the contribution of reconstruction dynamics to economic growth after 1950. As already mentioned in the introduction, however, these studies suffer from a multiple limitations due to small sample sizes, exclusive focus on either Western European or OECD countries, and potential omitted variable biases.

Small sample sizes weaken the conclusions of any econometric exercise. An explicit focus on European countries in this context, though, as in Dumke (1990), Smolny (2000), or Temin (2002), implies that in a cross-sectional analysis the reconstruction effect is only identified from

variation within this group of countries. If most European nations experienced similar output gaps compared to other parts of the world, then this effect may be imprecisely estimated and appear small. In the case of Vonyó (2008) this limitation does not apply, as the analysis is based on fixed-effects panel regressions and the relevant coefficients are identified from within-country variation. Even after the inclusion of country fixed effects, however, there may still be various other time-varying unobserved factors that bias the estimated effect of the war-induced output gap on subsequent growth.

By estimating the reconstruction effect based on a global sample, our approach does not only increase the number of observations; it also exploits the differential impact that the global shock of World War II had in different regions. In the early 1940s, vast areas of Europe, Asia and North Africa became the theatres of war and destruction, while the Western Hemisphere and other commodity-exporting regions experienced an economic boom. Beyond the geographical extension of our analysis, we also resolve a critical econometric identification problem. In order to obtain an unbiased estimate for β_2 in both specifications (1) and (2) , the size of the observed post-war output gap must not be correlated with unobserved country characteristics that also affect economic growth. Yet, as already suggested by Crafts (1995) and Temin (2002), the growth experience of different countries during the decades after World War II might as well have reflected a gradual return to a pre-existing long-run development trajectory.[9] In such a case, if all determinants of this long-run trajectory are not controlled for, our OLS estimates of β_2 may be upward or downward biased.

To avoid this omitted variable bias we propose an identification strategy that exploits the spatial distribution of the major battles of World War II and employs the minimum distance of countries from these battlegrounds as an instrument for the post-war output gaps. The underlying rationale behind our strategy is that proximity to war zones typically entailed greater wartime destruction and dislocation, and hence, larger output gaps after the end of the war. Using a geographical instrument, although novel in this particular context, has antecedents in the literature on historical development. Becker and Woessmann (2009) use the distance from Wittenberg to capture the exogenous impact of the spread of Protestantism on economic prosperity and human capital accumulation in 19th century Prussia. In a similar vein, Dittmar (2011) uses the distance from Mainz to capture the exogenous impact of the introduction of the printing press on economic development. More generally, Bleakley and Lin (2012) use spatial proximity to the fall-line of rivers in the United States to instrument for the effect of population density on wages. Fernihough and O'Rourke (2014) consider geographic distance of different cities in Europe to particular rock strata to identify the role that coal played in their development paths during the Industrial Revolution. Finally, Michaels and Rauch (2013) use Iron Age settlements in Britain and France to identify a source of exogenous various in the location of Roman-era

[9] This possibility is also indicated by Figures 1 and 2 for France and West Germany.

towns and future cities.[10]

3.3 Data

To compute our measures of the output gap in the years following the end of World War II, as already mentioned above, we use data from the Maddison Project. We also rely on the same source for data on per capita GDP levels and growth rates after 1950. We use Penn World Tables for data on the ratio of investment spending to GDP, the ratio of government spending to GDP, and the level of openness, measured as exports plus imports over GDP. For most countries we obtain these figures from the most recent version of the data set, version 8. For Cuba and Nicaragua, which are omitted from version 8, we use the previous version, Version 7. Finally, to obtain corresponding data for the Soviet Union, West Germany, Czechoslovakia, Yugoslavia and Myanmar, we go back to Version 5.6, the last edition that featured these countries. This allows us to maximize the number of countries in our sample.

To control for the effects of human capital accumulation on growth we use the data of Barro and Lee (2013). They provide the most comprehensive information on the years of schooling of different population groups for a large set of countries. For our baseline specification we use average years of formal schooling for men and women, as a broad measure of the level of human capital in the population. We focus on the population above 25 who across all countries must have largely completed their formal schooling. To obtain similar data for the Soviet Union, West Germany, Czechoslovakia and Yugoslavia, we again go back to a previous version of the data set published in 2000.[11]

To control for institutional factors that can influence the process of economic development we use data reported in Polity IV. This is the only source that provides comprehensive information on institutional quality and institutional development for a large number of countries reaching back to 1950.[12] From the various indicators available in Polity IV we employ in our empirical analysis the widely used *Constraints on the Executive* index.[13] It reflects the strength of the system of checks and balances present in each country, which is relevant for the security of property rights and the nature of intervention of the state in the economy.[14]

[10] Also the changing role of distance following major technological advances has been exploited as an exogenous source of variation in the literature. For example, Pascali (2014) and Feyrer (2009) analyze the impact of trade on economic development utilizing respectively the asymmetric effects of the introduction of the steamship and air transportation along different trade routes.

[11] We should note that using alternative measures of human capital such as average years of schooling for the working age population, average years of secondary schooling, secondary schooling enrollment rates or tertiary schooling enrollments rates does not affect any of our main results.

[12] The current version of the Polity IV dataset also includes information on former countries, which we use for the case of the Soviet Union, West Germany, Czechoslovakia and Yugoslavia.

[13] See Acemoglu, Johnson, and Robinson (2005) for a detailed discussion of the rationale of employing this indicator to capture cross-country institutional differences.

[14] Using alternative indexes of institutional quality provided by the same source such as the adjusted Polity

We report basic descriptive statistics for all the aforementioned variables in Panel A of Table 2. The statistics are based on our baseline sample of 57 countries for which all variables are observed. What is striking from the summary statistics is the high level of dispersion in our baseline output gap measure. Compared to all other growth determinants, the post-war output gap appears to be the one that varies the most across countries in our sample.

[Insert Table 2 around here]

Panel B of the same table reports the pairwise correlation coefficients between these variables. As these coefficients reveal, most variables are not highly correlated with each other. Thus, including these variables together in the same regression does not lead to multicollinearity problems. The only exception is the strong correlation between per capita GDP in 1950 and average years of schooling over the period 1950-1980. As we show below, however, the results hardly differ between the cases where average years of schooling are excluded or included in the regression specification.

What is more important to note from the correlation matrix is the strong negative correlation between a country's post-war output gap and its rate of growth between 1950 and 1980. This correlation is much higher than that of the growth rate with any other variable and already suggests the main conclusion of our analysis: Differences in growth rates across countries over this period are to a large extent explained by the size of the output gaps that emerged as a consequence of World War II. The nature of this correlation can also be seen in the scatter plot of Figure 3. As the diagram reveals, the strong negative association between the two variables is not driven by just a few influential observations, but it reflects instead a global pattern. For comparative purposes, Figure 4 plots average growth rates over the same period against initial income levels in 1950. In contrast to our previous diagram, in this case the negative association appears substantially weaker.

[Insert Figure 3 around here]
[Insert Figure 4 around here]

For the purpose of our regression analysis and our instrumental variables strategy, in particular, we need information on the involvement of each country in World War II and its proximity to the location of the major battlefronts. To classify war involvement we do not simply catalogue declarations of war; we consider whether a country experienced hostilities on its soil or had troops involved in combat activity based on information from Keegan (1989). This is an important distinction. In World War II, declarations of war provide a distorted picture of actual

score, which reflects the level of democratization of the political system of a country yields results similar to the ones reported below.

war involvement. Many declarations had little consequence as they were made only towards the end of the war and often by countries located far from the epicenter of the hostilities.

Our measure of each country's proximity to major battles is constructed as follows. We first identify all the combat operations in which the number of casualties from both sides together exceeded 100,000.[15] For each of these operations we compute the geodesic distance of its epicenter to the capital cities of all countries in our data set.[16] From all these distances to a given capital our instrument measures proximity to the closest major battle.[17] We do so as our analysis includes countries located in different parts of the world and for which proximity to at least one of the multiple theaters of war sufficed for the country to experience significant wartime destruction or dislocation.[18]

Using this approach has the advantage that our exogenous measure of the World War II shock for each country can be quantified easily with only limited reliance on wartime casualty data. Nevertheless, to assess the relevancy of a country's minimum distance from a major World War II battle as an instrument for its post-war output gap, we compare it with available wartime casualties data and population changes during the war years.[19] In both cases we find strong evidence that countries located further away from the major battle zones experienced larger increases in population and fewer casualties during the war. Yet, given that the available data on war casualties and destruction for a large number of countries are very rough (Krivosheev, 1997; Mitter, 2013; Overmans, 2009), we do not employ them formally in our analysis.

4 Estimating the Effect of Reconstruction across Countries

4.1 OLS Regressions

We begin the presentation of our regression results with a set of simple cross-sectional specifications reported in Table 3. In all specifications, the dependent variable is the average growth rate of per capita GDP from 1950 to 1980. This is first regressed on the natural logarithm of

[15] Our main sources of information for the classification of battles is Dear and Foot (2007), Tucker and Roberts (2005) and Kennedy (2007).

[16] To identify the epicenters we use the geographic coordinates provided by Wikipedia.

[17] As an alternative measure we also consider a weighted average distance from each country's capital to all battles with the weights reflecting relative numbers of casualties. Using this alternative measure produces qualitatitively similar results.

[18] This point can be illustrated by the case of the Philippines, a country severely affected by the war in the Pacific but at the same time far from the battlefronts in Europe. Using a weighted average distance from all major battles implies that for the Philippines war disruptions should have been as small as in South Africa. Using a minimum distance instead leads one to infer a war impact similar to that experienced by Austria, which is not far from what the output gaps in Table 1 imply.

[19] We use the data of Maddison to compute changes in population during the war years and casualty figures from the Wikipedia page on World War II casualties (http://en.wikipedia.org/wiki/World_War_II_casualties).

per capita GDP in the initial year, 1950, and on the average output gap between 1946 and 1950, reported in columns (1) and (2) of Table 1 respectively.[20] We then sequentially add our control variables following the standard practice in the empirical growth literature of using for each a period-average value.

[Insert Table 3 around here]

Column (1) of Table 3 reports the results of a simple univariate OLS regression of average growth rates between 1950 and 1980 on initial GDP per capita. The obtained coefficient is negative, echoing the negative correlation observed in Panel B of Table 2, but it is statistically insignificant. This suggests some limited degree of convergence over this period among the countries in our sample, with those starting off at a lower income levels growing subsequently faster. In comparison, column (2) reports a similar regression with the post-war output gap replacing the initial level of per capita GDP. The estimated coefficient is negative, larger and highly statistically significant. This result underscores how economic growth between 1950 and 1980 was much more rapid in countries whose level of output in the late 1940s was below their long-run productive potentials.

The relative importance of these two channels is assessed with a simple "horse-race" regression where the initial income level and the post-war output gap are both included as regressors. As we can see in column (3), the magnitude of the output gap coefficient hardly changes, while the coefficient on initial income drops by a half. This finding suggests that the high growth rates observed during the golden age were primarily driven by a rapid recovery of World-War-II-affected countries from the wartime shock and less by the catch-up process of less developed countries with advanced nations.

To capture other potential factors that may have driven growth over this period, in columns (4) and (5) we add the investment share and the rate of population growth as controls. By doing so, we allow for the fact that economies at different stages of development might be converging to different steady-state paths.[21] We introduce these controls first in a specification without the output gap and then in one that includes it. Both the rate of population growth and the rate of investment enter with the signs predicted by the theory. Countries that over this period invested a higher share of their income and experienced lower rates of population growth witnessed faster income growth. The former effect, however, appears weak and statistically insignificant in our sample of countries, at least in the cross-sectional specification.[22] The effect of initial income

[20] In most regressions we employ our baseline values for the post-war output gap. The alternative ones reported in columns (2) and (3) of Table 1 are only used later on for comparison.

[21] We should note here that previous cliometric investigations into the role of post-war reconstruction did not distinguish carefully between cases of conditional and unconditional convergence as we do here. This approach of not controlling for the steady-state determinants may be justifiable if one focuses exclusively on advanced western economies. Yet, it becomes problematic when one looks at a global sample of countries.

[22] As the results of our panel growth regressions will later on reveal, this is mostly likely due to our small sample size.

in both regressions is negative and statistically significant, while its magnitude is now slightly higher suggesting some degree of conditional convergence across countries.

Adding our output gap measure in column (5) yields the same effect as in columns (2) and (3). The coefficient is still negative and statistically significant and its magnitude remains high. The fact that the post-war output gap still has a strong effect after controlling for both initial income and period-average investment rates suggests a broader interpretation of the reconstruction thesis, which extends beyond technological catch up and the rebuilding of destroyed infrastructure. This finding is in line with the dominant view of the recent German historiography literature, which has consistently argued that the economic collapse after 1945 owed more to dislocation than to destruction of factor endowments. Thus, a substantial part of reconstruction growth not investment driven, but resulted simply from a more optimal matching of otherwise available but initially under-utilized factors of production.

In columns (6) and (7) we broaden our set of controls with additional variables, frequently featured in cross-country growth regressions. This variables include the share of government spending in GDP, the level of openness, the average years of formal schooling in the adult population, and the Polity IV "constraints on the executive" score as a measure of institutional quality. In our small sample of countries the effects of these variable are not particularly strong with the coefficients being statistically insignificant.[23,24] Hence, their inclusion hardly alters our conclusions from the previously discussed specifications regarding the significance of the output gap and the other variables.[25]

Taking the regression specification of column (7) as a baseline, we can assess the robustness of the observed patterns by adjusting, first of all, the time period under consideration. We report the results in Table 4, in which the predictive power of the output gap, initial income and the other controls is compared over the time intervals 1950-1960, 1950-1970, 1950-1980, 1950-1990 and 1950-2000. Due to data constraints, this exercise can only be performed on a smaller sample of 47 countries. The results, however, are clear. While the magnitude and significance of the coefficient on initial income and on human capital are increasing over time, the reconstruction effect peaks during the 1970s and then declines. This suggests that reconstruction dynamics and conditional convergence were two phenomena operating over different time horizons, with the former driving growth primarily during the early post-war decades.[26]

[23] As our panel results later on reveal, this seems to be due to the small size of our sample.

[24] The fact that our human capital and instutional controls do not have a statistically significant effect on growth might be due to their positive correlation with the initial level of GDP per capita.

[25] In regressions not reported, we have also considered the effect of additional control variables that may have influenced growth rates during the post-war era. These include a country's level of democratization, membership in the Bretton Woods systems, colonial status, employment shares in agriculture and manufacturing and various geographic controls. Yet, none of them seem to crucially alter our main findings.

[26] In our panel analysis below we further investigate the exact horizon over which the reconstruction dynamics operated.

[Insert Table 4 around here]

Our results so far suggest that the estimated reconstruction effect on post-war growth is not sensitive to changes in the regression specifications. Having established this important finding, it is essential to assess the magnitude of the effect. The coefficient obtained in our baseline specification implies that a one-standard deviation change in the output gap in the aftermath of World War II should have led to an opposite-direction adjustment of the average rate of growth between 1950 and 1980 by 0.4 percentage points. This effect might appear small on a first reading. However, given the large dispersion of output gaps across countries, it actually makes the post-war output gap the single most important predictor of growth rates over this period. It implies that in the absence of any difference in these gaps, the average annual rates of economic growth in France, Germany and the United States between 1950 and 1980 would have been almost identical.

To assess the robustness of our baseline results, we subject them to a variety of additional checks. Below we report checks related to variable specification and sample selection; checks related to potential biases due to measurement error are discussed in paper appendix. We begin by comparing the results of our baseline specification using different measures of the post-war output gap. The results are reported in Table 5. For ease of comparison, the first column reports once again the results of column (7) from Table 3. Column (2) shows how the results of our baseline regression change if we replace all positive output gaps reported in column (1) of Table 1 with zeros and, thus, focus exclusively on the predictive power of the negative output gaps. The relationship between the post-war output gap and subsequent growth does not appear different from what we have observed so far, but the magnitude of the estimated coefficient is now higher. This is in line with the nature of reconstruction dynamics as envisaged by Jánossy, which are not expected to operate symmetrically for countries above and below their long-run growth trajectories. Wartime dislocation due to temporary overproduction achieved by concentrating large proportions of the workforce in high value-added sectors required shorter post-war adjustment periods than dislocation caused directly by destructive wartime activity.

[Insert Table 5 around here]

The next two columns indicate how the results are affected if we employ respectively the alternative output gap measures of columns (2) and (3) in Table 1. As column (3) reveals, the post-war output gap coefficient remains negative as in the previous columns if computed using pre-World-War-I instead of interwar growth rates when extrapolating after 1938. Yet, statistical significance is now lost. The results we find are quite different if we compute the post-war output gap by extrapolating from pre-1914 trajectories. As we see in column (4), this output gap coefficient in this case has the wrong sign and is statistically insignificant. This demonstrates that reconstruction dynamics after World War II owed little to previous global shocks such as

the Great War and the Great Depression. The statistically relevant output gaps after 1945 reflected much more the singular effect of World War II than the cumulative effects of all the major disrupting events in the first half of the 20th century. Thus, our findings do not support an interpretation of the high growth rates of the golden age as the result of an "accumulated developmental deficit" (Temin, 2002; Abelshauser, 2004).

In the remaining columns of Table 5 we assess the potential heterogeneity of the reconstruction dynamics across different regions of the world. As a first check in column (5) we introduce regional dummies for both European and Asian countries, while in column (7) we include a dummy variable to separate countries that were actively involved in World War II from those that were not. In both cases the dummies are statistically insignificant, which suggest no systematic differences in post-war growth rates across these sub-samples of countries. However, interacting these dummies with the output gap reveals substantial differences in the importance of the reconstruction effect across countries. As column (6) demonstrates, the effect was much larger in Europe and in Asia compared to the rest of the world. Similarly, column (8) shows that the effect was much stronger among countries that were heavily engaged in the war. Both in Europe and in Asia hostilities caused major disruptions in economic activity in some countries and boosted in industrial production in others. This differential effect was the main cause for the subsequent dispersion in growth rates across countries in these regions during the golden age. It should be noted, though, that such disruptions also affected economic activity in countries outside these regions, as evident from the negative link between growth rates and the output gap. Overall reconstruction growth was not just a European but a global phenomenon with a large and lasting impact.

4.2 2SLS Regressions

As we already explained in our introduction, a potential limitation of the results reported until now is that they may be subject to endogeneity biases. In the presence thereof the reconstruction effect could be severely over- or underestimated. These biases could be due to mismeasurement of the post-war output gap or to confounding determinants of growth rates omitted from our specifications. Both considerations are important. The output gaps reported in Table 1 are likely to suffer from measurement error arising either from the weaknesses of the Maddison GDP figures or from our imperfect calculation of potential GDP levels. Additionally, there may be other reasons why some countries had low output gaps but still experienced high growth rates over the post-war period, which are not captured by any of our employed regressors.

To account for these potential biases, we re-estimate the effect of the post-war output gap in our baseline specification with the aid of an instrumental variable. Our preferred instrument is the natural logarithm of the distance from the capital city of each country to the location of the closest major World-War-II battle, given the reasons explained in subsection 3.3. The results

obtained from this instrumental variable approach are reported in Table 6.[27] For robustness purposes this estimation is performed with the full set of controls from Table 3.

[Insert Table 6 around here]

To permit an easy comparison between the OLS and the 2SLS results, column (1) reports again the OLS baseline estimates. As a simple test of the strength of the instrument, column (2) reports the reduced form regression, where the instrument replaces our output gap measure estimated with OLS. As expected, a high minimum distance from a major World-War-II battle implies lower growth during the post-war era, an effect that is statistically significant at the 5% level. As this effect is also conditioned by the level of per capita GDP in 1950 and other determinants of growth rates, the estimated coefficient on the minimum distance must be capturing the effect of post-war reconstruction. This intuition is further confirmed in the first-stage regression, reported in column (3). Here we observe that a large negative post-war output gap is strongly positively correlated with proximity to the battlefronts of World War II. The strength of our instrumental variable is also indicated by the F-statistic for the first-stage regression which exceeds the typical threshold value of 10 suggested by Staiger and Stock (1997).

Turning to the actual IV regression reported in column (4), we see that there is a strong inverse relationship across countries between post-war growth rates and the initial output gap, now instrumented with distance from the battlefronts. Comparing the 2SLS and OLS coefficients we now find a reconstruction effect that is 50% larger and even more statistically significant. It implies that, correcting for the potential endogeneity biases, a country with an output gap one standard deviation below the mean would have grown on an annual basis 0.8 instead of 0.4 percentage points faster between 1950 and 1980 than a country with an output gap corresponding to the sample mean. This implies in the context of our previous comparison that, had World War II not happened, the United States would have grown faster than France and France would have grown faster than Germany, rather than the other way round.

Given the range of growth rates seen in the post-war period, these magnitudes are not implausible. They suggest that the potential mismeasurement of the post-war output gap or the omission of offsetting determinants of growth rates isthe reason behind the lower OLS estimates of the post-war reconstruction effect.[28] Our 2SLS estimate captures the magnitude of the effect more precisely. This intuition is confirmed by looking at the threshold levels for the F-statistic of Stock and Yogo (2005) which suggest that the 2SLS bias is less than 10% of the OLS bias. Hence, the results of Table 7 should make us confident that our earlier conclusions were not driven by potential endogeneity biases that are frequent in OLS regressions. On the contrary, previous

[27] The results are similar if instead of the minimum distance to one of the major World-War-II battles we use the average distance to all major battles weighted by casualties. For brevity these results are not reported here.

[28] International technology diffusion might be such a factor not taken into consideration.

studies on the topic that relied exclusively on OLS regressions, if anything, underestimated the power of reconstruction dynamics during the golden age.

5 Estimating the Effect of Reconstruction over Time

5.1 Panel Regressions

The cross-sectional results reported in the previous section strongly suggest that the reconstruction process that began after the end of World War II was the most important driver of relative growth performance during the early post-war period. Moreover, the 2SLS results should make us confident that the negative association between the post-war output gap and subsequent growth rates is not driven by other unobserved factors or measurement error in the data. Nevertheless, one limitation of conducting the analysis in the context of a cross-sectional specification is that the latter does not isolate the effect of reconstruction dynamics from changes in growth-rate trends observed over time. This limitation may not affect the statistical significance of the output gap in a cross-sectional specification, but it is likely to influence the estimated magnitude of the reconstruction effect on growth rates.

Therefore, the present section re-estimates our main specifications based on panel regressions of equation (2) that include country and period fixed effects. The advantage of this specification is that it isolates common time trends in growth rates in the period fixed effect, and thus, estimates the net impact of reconstruction above these common trends. Furthermore, the inclusion of country fixed effects eliminates the potential bias in the estimated coefficients from unobserved time-invariant but country-specific factors that might influence relative growth performance, such as geographic characteristics, institutional features or cultural attitudes not already picked up by the included control variables.

The results of the panel estimation are displayed in Table 7. Columns (1), (2) and (3) report the results obtained from regressions in which the dependent variable is the average annual growth rate over non-overlapping 10-year periods starting from 1950. Following the standard practice in the empirical growth literature, for each of these 10-year panels the control variables corresponds to the respective period average values, while the initial per capita GDP corresponds to its value in the first year of each period. Columns (4), (5) and (6) report the corresponding results that we obtain if we estimate the regressions with 5-year panels. In all six cases, we estimate our baseline specification that includes the full set of controls as well as country and period fixed effects.

[Insert Table 7 around here]

The regressions reported in columns (1) and (4) do not include the output gap. The estimated coefficients on the initial value of per capita GDP and most controls have the expected signs. A

higher initial income implies lower growth rates in line with the conditional convergence hypothesis, an effect that is now highly statistically significant. Faster population growth depresses the rate of economic growth due to capital dilution effects, while high investment rates boost growth. Similarly, a higher share of government spending hampers growth, while greater openness in the economy accelerates it. All these four effects are statistically significant in the reported specifications. On the other hand, we don't find any evidence of human capital or institutional quality having a statistically significant impact on growth rates.[29] This is most likely due to a lack of variation in these variables over time and their high correlation with the level of initial income that we already remarked upon.

To assess the impact on growth over time of our main variable of interest, the post-war output gap, we look at its interaction with the period dummies. Given the potential endogeneity problem, we also use instead our instrumental variable, the minimum distance from a major World War II battle. The period-by-period estimated coefficients in both cases are reported in Table 7. The p-values of the joint statistical significance tests for the interaction effects of the output gap with the period dummies are reported at the bottom of each column. The results of similar tests are also reported for the country and the period fixed effects.

Columns (2) and (5) display the results when the period dummies are interacted with the average output gap value for each country between 1946 and 1950. The coefficients obtained are similar to our cross-sectional estimates for most periods, but fall mostly below conventional levels of statistical significance. Finally, columns (3) and (6) demonstrate how the results change when the output gap variable is replaced with our instrumental variable, the minimum distance of a country's capital to a major World War II battle.[30] The interaction effects with our instrument are negative and statistically significant for the time periods until the mid 1970s and insignificant afterwards.

The p-values of the joint significance tests for the interaction effects suggests similar conclusions. The interaction effects with the output gap in columns (2) and (5) are in both cases jointly insignificant, while the interactions effects with the minimum distance in columns (3) and (6) are statistically significant. Furthermore, testing separately the statistical significance of the interaction effects for the earlier and later periods reveals that they are jointly significant in the former and insignificant in the latter case. Specifically, in column (3) we obtain this result when separating before and after 1980, while in column (6) we obtain a similar result when we set the cutoff in 1975.[31]

These findings, which emerge from the analysis of both the 10-year and the 5-year panel,

[29] Despite their insignificance, we think that it is important to include these variables in the regression, as they should correlate with the steady state level of per capita income to which each country is converging.

[30] To keep the table from growning too long, we report in the same row the coefficients for both the cases where the actual output gap and the instrument is interacted with each period dummy.

[31] Country and period dummies are on their own also jointly statistically significant. This implies that over the whole post-war period there were substantial differences in growth rates across countries and periods.

support the idea that the post-war reconstruction dynamics had a lasting influence on economic growth that persisted until the mid 1970s. They also concur with those of Ben-David, Lumsdaine, and Papell (2003), who identified a structural break in the post-war growth trajectories of OECD countries three decades after the end of World War II. They suggest that globally the golden age of economic growth was largely driven by the reconstruction dynamics and it came to an end as these dynamics vanished. Our findings extends previous results by Vonyó (2008) documenting a strong, albeit gradually vanishing, reconstruction effect for OECD countries during the 1950s and 1960s. They contrast, though, with many earlier studies which suggested that reconstruction effects were much less persistent and their influence did not last beyond the 1950s.

5.2 Counterfactual Post-War Growth Rates

The panel regressions reported above have the additional advantage of allowing us to quantify the impact of reconstruction on economic growth over time. Based on the panel estimates of the reconstruction effect across different periods, we can perform a counterfactual analysis of what global growth rates would have been had World War II not happened. This analysis complements the counterfactual simulation exercises conducted by King and Rebelo (1993), Gilchrist and Williams (2004), Alvarez-Cuadrado (2008), and Alvarez-Cuadrado and Pintea (2009) on the role of reconstruction dynamics in post-war growth. It differs from these previous studies, however, in two important dimensions. First, it goes beyond a few selected countries directly affected by the war. Second, it is based on econometric estimates of the reconstruction effect rather than on calibrated macroeconomic models.

In order to conduct this analysis we use the estimated growth effects of post-war reconstruction reported in column (6) of Table 7. These estimates are obtained using the minimum distance instrument and are broken down more finely for every quinquennium starting from 1950. They allow us to calculate for each country and each quinquennium the impact of proximity to the location of the closest major World War II battle on post-war growth rates. Netting this effect out, we obtain a counterfactual estimate for the rate of growth that would have been achieved in the post-1950 world had cross-country differences in wartime experience not mattered. In other words, these growth rates give us the evolution of per capita GDP that would have been observed in each country, had World War II not happened.

[Insert Table 8 around here]

In the following step, we aggregate these counterfactual growth rates across the 57 countries of our sample as a weighted average using total GDP weights. These hypothetical growth rates are reported together with the observed sample-average rates in the two panels of Table 8 by quinquennium. Panel A covers the years from 1950 to 1975 for which the differences between the actual and the counterfactual growth rates are sizeable. Panel B accounts for the years from

1975 to 2000 for which we observe much smaller differences. Focusing on the average effect over the period between 1950 and 1975, the average annual rate of global economic growth would have been 1.4 percentage points lower than the actual 3.28%. This is a very sizeable effect compared with the counterfactual growth adjustment we demonstrate for the subsequent period. During the last quarter of the 20th century, our counterfactual analysis suggests that average annual growth globally would have been merely 0.5 percentage points slower in the absence of the post-war reconstruction dynamics than the actually observed rate of 1.72%. Effectively, therefore, reconstruction growth accounts for most of the difference in global growth rates between the two sub-periods in the post-war era. The golden age was almost entirely the consequence of the global economic recovery from World War II.

Following a similar approach we can compute counterfactual growth rates assuming no differences across countries for each of the other variables. Using again the estimated coefficient for each respective variable, we can net out its effect from the observed growth rates. Table 8 reports these counterfactuals for the case of three additional variables: initial income, openness and institutional quality. As these variables are time-varying, in all cases we can again calculate a counterfactual effect for every country and every quinquennium starting from 1950 onwards and aggregate them up even though the estimated coefficients are not time-varying.

From the counterfactual growth rates that net out the effect of initial income differences we get a sense of how much growth rates were influenced by conditional convergence dynamics over the post-war period. Our counterfactual estimates suggest that these dynamics had their influence too on growth, but their effects are not large enough to explain the substantial difference in global growth rates between the post-war golden age and the decades that followed it. The countries in our sample that started out with relatively lower levels of GDP per capita did grow relatively faster over this period. Yet, this effect increased growth rates by less than 0.6 percentage point over the period 1950-75 and about 0.3 percentage point during the last quarter of the twentieth century. This finding makes it difficult to attribute the rapid growth of the early post-war years and the growth slowdown after 1975 convergence dynamics.

Looking at the counterfactuals based on the other two variables, we see hardly any changes in growth rates compared to those actually observed for our sample of countries. This does not imply that the post-war expansion of trade and institutional improvements did not influence relative growth performance across countries. Progress on both dimensions was more or less continuous in most of our sample countries throughout this period. What our results suggest is that these factors alone would not have generated the historically unmatched global growth record of the post-war golden age had World War II not happened. Instead it is likely that the coordinated efforts in many countries to expand international trade and promote institutional change were part of a necessary policy response in an era of strong reconstruction dynamics that operated in all regions of the world affected by the horrors of war in the early 1940s.

6 Concluding Remarks

The period since the end of World War II has been the testing ground for most theories about economic growth. Yet, this is the very same period that saw most economies recovering from the major shocks caused by the largest armed conflict in human history. It brought unprecedented destruction to vast territories in Europe, Asia and North Africa, while at the same time, it generated an economic boom in the Americas and several commodity exporting nations in other parts of the world. This coincidence is likely to complicate the inferences that can be drawn about the mechanics of growth during the post-war era. While there are important lessons to be learned from the diverse growth experiences of different countries in this period, our understanding of global and regional growth patterns cannot be complete without a framework that specifically accounts for the contribution of reconstruction dynamics.

In this paper we make a systematic attempt to isolate and quantify the impact of World War II on economic growth during the half century that followed it. Our work builds upon previous cliometric studies on this topic, but employs a set of methodological innovations in order to provide a more comprehensive answer to the question. Specifically our approach: (i) uses a larger sample of countries that is not biased towards war-shattered advanced economies, (ii) isolates the reconstruction effect from both country and time specific factors unobserved by standard growth regressions, (iii) employs instrumental variables to isolate the effect of the output gap in the aftermath of the war from other determinants of post-war growth rates and (iv) it uses a battery of econometric techniques to carefully quantify the contribution of reconstruction dynamics to differential growth rates in the post war era.

Our estimates suggest that the negative shock of World War II had a quantitatively important and statistically significant effect on subsequent economic growth. This confirms the intuition of many economic historians regarding the role of post-1945 reconstruction dynamics. Moreover, these effects are shown to have affected various parts of world and to have lasted until the mid 1970s. In the absence of the global shock invoked by World War II, it is valid to argue that the growth performance of the world economy during the quarter century after 1950 would not have been exceptional. Instead the growth rates we would have hypothetically observed during these twenty-five years in the absence of World War II would have been similar to the respective growth rates for the period 1975-2000 and would not have justified the label "the golden age of economic growth".

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Appendix: Additional Robustness Checks

In this appendix we report the results of a set of additional robustness checks related to the issues of measurement error and outlying observations that might bias the results of our baseline specification discussed in subsection 4.1. One potential concern with our results is that they may hinge on the exact time period during which the output gap is measured or be driven by some strong leverage data points from countries heavily affected by the war. As the results reported in Table A1 reveal, this does not seem to be the case.

[Insert Table A1 around here]

Column (1) reports for the purpose of comparison our baseline specification where the post-war output gap is measured as the average over a window of 5 years, from 1946 to 1950. This choice is justified if the per capita GDP figures are subject to the same degree of measurement error during all years in the late 1940s. Yet, if measurement error is greater in the years closer to World War II, then using the earlier per capita GDP figures are bound to make our output gaps noisier. With that in mind, in column (2) we report the same specification with the post-war output gap now measured by taking an average value between 1948 and 1950 and in column (3) by using the 1950 values. Clearly moving away from 1945 alters the size of the output gaps across countries and reduces their power in predicting subsequent growth. By and large, however, the results of all three columns are very similar and do not seem to hinge on the exact year in which the post-war output gap is computed.

To correct for any potential biases in the quality of the data across countries, in column (4) we reports the results of our baseline specification with each country observation now weighted by its level of per capita GDP. Such correction, though, hardly seems to alter the estimated coefficients. Finally, in column (5) we reports the results of the same specification with the estimation performed based on Robust Least Squares. This limits the influence on the estimated coefficients of potential outlying observations and strong leverage points. Taken together with the patterns of Figures (3) and (4), this set of results suggests that our findings are not subject to a significant outlier bias.[32]

[32] A formal test also reveals that our regressions results do not suffer from a heteroskedasticity problem.

Table 1 - Average Post-War Output Gaps, 1946-1950

	Baseline	Alternative 1	Alternative 2
Projecting from year	1938	1938	1913
Based on growth rates from	1920-1938	1890-1913	1890-1914
Austria	-0.4014	-0.3426	-0.5543
Belgium	-0.1496	-0.0558	-0.1427
Denmark	-0.1247	-0.1136	-0.2172
Finland	-0.2732	-0.0983	-0.0658
France	-0.2285	-0.1554	-0.3010
Germany	-0.5507	-0.4690	-0.5478
Italy	-0.1890	-0.1598	-0.2550
Netherlands	-0.1063	-0.0570	-0.0014
Norway	-0.1080	-0.0010	0.1687
Sweden	-0.0603	-0.0143	-0.0955
Switzerland	-0.0318	-0.0625	-0.3443
United Kingdom	-0.0567	-0.0053	0.0201
Ireland	-0.0292	-0.0388	-0.1662
Greece	-0.5728	-0.3477	0.4835
Portugal	-0.0777	0.0976	0.3188
Spain	-0.2624	0.0983	-0.2624
Australia	0.0440	0.1240	0.1251
New Zealand	0.0300	0.0102	-0.1272
Canada	0.4133	0.1610	-0.4326
United States	0.3988	0.2234	-0.1369
Albania	-0.2303	-0.0914	-0.2303
Bulgaria	-0.2512	-0.0748	0.2230
Czechoslovakia	-0.0778	-0.0465	-0.0778
Hungary	-0.3735	-0.3219	-0.4156
Poland	-0.1328	-0.0368	-0.1328
Romania	-0.3441	-0.3441	-0.6748
Yugoslavia	-0.0636	-0.0125	-0.0167
Soviet Union	-0.4703	-0.1225	-0.2471
Argentina	0.0915	0.0235	-0.3064
Brazil	0.0234	0.2003	0.7230
Chile	-0.0852	-0.0815	-0.4239
Colombia	-0.1789	0.0515	0.9362
Mexico	0.2485	-0.0170	-0.4575
Peru	-0.1503	-0.1478	-0.1555
Uruguay	0.0481	0.0178	-0.2416
Venezuela	-0.2394	0.5232	3.3531
Costa Rica	-0.0540		
Cuba	0.3413	0.3413	-0.1481
Ecuador	0.2749	0.1119	-0.1806
El Salvador	0.3777		
Guatemala	-0.3619		
Honduras	0.1896		
Jamaica	0.2113	0.4441	1.0682
Nicaragua	0.4123		
China	-0.1813	-0.1799	-0.1845
India	-0.1565	-0.1565	-0.3391
Indonesia	-0.2872	-0.3097	-0.3511
Japan	-0.4175	-0.4277	-0.3593
Philippines	-0.4242	-0.4725	-0.5215
South Korea	-0.1837	-0.1321	0.2770
Thailand	-0.0120	-0.0429	-0.1366
Taiwan	-0.4549	-0.3956	-0.1907
Burma	-0.4324	-0.4324	-0.4568
Malaysia	-0.1556	-0.1294	0.0445
Sri Lanka	-0.0988	-0.1881	-0.4338
Turkey	-0.3958	-0.1853	-0.0745
South Africa	-0.0770	0.1041	0.4545

Table 2 - Summary Statistics and Part. Correlations for Selected Variables

Panel A: Summary Statistics

Variable	Obs	Mean	St. Dev	Min	Max
pcGDP Growth 1950-1980	57	0.0307	0.01314	0.0102	0.0675
Output Gap 1946-1950	57	-0.1124	0.24512	-0.5728	0.4133
pcGDP 1950 (logs)	57	7.7939	0.78449	5.9814	9.1654
Pop. Growth 1950-1980	57	0.0175	0.00996	0.0028	0.0369
Invest. Share 1950-1980	57	0.2327	0.07412	0.0556	0.4515
Gov. Share 1950-1980	57	0.0990	0.05027	0.0240	0.2558
Openness 1950-1980	57	0.4276	0.21528	0.0733	0.8872
Schooling 25+ 1950-1980	57	4.8590	2.34426	1.1131	10.3249
Exec. Constraints 1950-1980	57	4.5346	2.18490	0.9667	7.0000

Panel B: Pairwise Correlations

Variable	Growth 1950-80	Gap 1946-50	pcGDP 1950	PopGrowth 1950-80	InvShare 1950-80	GovShare 1950-80	Open 1950-80	Schooling 1950-80
pcGDP Growth 1950-80	1							
Output Gap 1946-1950	-0.4864	1						
pcGDP 1950 (logs)	-0.2177	0.2197	1					
Pop. Growth 1950-1980	-0.3424	0.2644	-0.4088	1				
Invest. Share 1950-1980	0.1766	-0.2406	0.0269	-0.0558	1			
Gov. Share 1950-1980	0.1434	-0.0293	-0.1246	-0.1248	-0.3082	1		
Openness 1950-1980	-0.1644	0.1893	0.1661	-0.0774	-0.048	0.0822	1	
Schooling 25+ 1950-1980	0.0764	0.0923	0.7098	-0.5823	0.0798	0.1367	0.215	1
Exec. Constraints 1950-1980	-0.0606	-0.035	0.5295	-0.3241	-0.099	-0.0916	0.228	0.475

Table 3 - Cross-Sectional Growth Regressions - Varying Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable:	Growth Rate 1950-1980						
Estimation Method:	OLS						
pcGDP 1950 (logs)	-0.00364		-0.00195	-0.00720***	-0.00527**	-0.00864***	-0.00691**
	[0.00220]		[0.00202]	[0.00211]	[0.00220]	[0.00305]	[0.00304]
Pop. Growth 1950-1980				-0.671***	-0.512***	-0.560***	-0.387*
				[0.167]	[0.175]	[0.191]	[0.200]
Invest. Share 1950-1980				0.0283	0.0165	0.0303	0.0150
				[0.0205]	[0.0204]	[0.0226]	[0.0229]
Gov. Share 1950-1980						0.0186	0.0117
						[0.0353]	[0.0341]
Openness 1950-1980						-0.00974	-0.00663
						[0.00740]	[0.00727]
Schooling 25+ 1950-1980						0.00103	0.00140
						[0.00112]	[0.00109]
Exec. Constraints 1950-1980						0.000286	-0.000177
						[0.000870]	[0.000864]
Gap 1946-1950		-0.0261***	-0.0247***		-0.0156**		-0.0161**
		[0.00631]	[0.00648]		[0.00687]		[0.00732]
Observations	57	57	57	57	57	57	57
R-squared	0.047	0.237	0.249	0.296	0.360	0.336	0.396

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 4 - Cross-Sectional Growth Regressions - Varying Time Horizons

	(1)	(2)	(3)	(4)	(5)
	Growth	Growth	Growth	Growth	Growth
Dependent Variable:	1950-60	1950-70	1950-80	1950-90	1950-00
Estimation Method:			OLS		
pcGDP 1950 (logs)	-0.00564	-0.00607	-0.00668**	-0.0115***	-0.0119***
	[0.00422]	[0.00396]	[0.00329]	[0.00324]	[0.00257]
Pop. Growth (Period Average)	-0.513**	-0.569**	-0.411*	-0.589***	-0.628***
	[0.208]	[0.224]	[0.207]	[0.214]	[0.184]
Invest. Share (Period Average)	0.0730**	0.0425	0.0318	0.0342	0.0273
	[0.0275]	[0.0314]	[0.0286]	[0.0303]	[0.0257]
Gov. Share (Period Average)	0.136**	0.0754	0.0524	0.0161	0.00672
	[0.0522]	[0.0515]	[0.0448]	[0.0446]	[0.0361]
Openness (Period Average)	-0.0217**	-0.00983	-0.00736	-0.00493	-0.00119
	[0.00986]	[0.00972]	[0.00805]	[0.00779]	[0.00578]
Schooling 25+ (Period Average)	-0.000697	0.00164	0.00205*	0.00296**	0.00302***
	[0.00169]	[0.00157]	[0.00121]	[0.00115]	[0.000920]
Exec. Constraints (Period Average)	0.00192	-0.000972	-0.00146	-0.000928	-0.00140
	[0.00121]	[0.00124]	[0.00102]	[0.00113]	[0.00106]
Gap 1946-1950	-0.00817	-0.0163*	-0.0180**	-0.0161**	-0.0134**
	[0.00973]	[0.00847]	[0.00773]	[0.00734]	[0.00582]
Observations	47	47	47	47	47
R-squared	0.486	0.432	0.465	0.541	0.640

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 5 - Cross-Sectional Growth Regressions - Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable:	Growth Rate 1950-1980							
Estimation Method:	OLS							
pcGDP 1950 (logs)	-0.00691**	-0.00697**	-0.00560	-0.00935**	-0.00702*	-0.00497	-0.00812**	-0.00674**
	[0.00304]	[0.00298]	[0.00375]	[0.00360]	[0.00400]	[0.00356]	[0.00361]	[0.00325]
Pop. Growth 1950-1980	-0.387*	-0.410**	-0.503**	-0.655***	-0.0659	-0.349	-0.549***	-0.380*
	[0.200]	[0.191]	[0.222]	[0.226]	[0.311]	[0.229]	[0.196]	[0.207]
Invest. Share 1950-1980	0.0150	0.0185	0.0292	0.0242	0.00505	0.0219	0.0287	0.0144
	[0.0229]	[0.0221]	[0.0241]	[0.0258]	[0.0251]	[0.0257]	[0.0236]	[0.0234]
Gov. Share 1950-1980	0.0117	0.00739	0.0125	0.00635	0.0102	0.00669	0.0165	0.0102
	[0.0341]	[0.0339]	[0.0377]	[0.0390]	[0.0344]	[0.0342]	[0.0364]	[0.0356]
Openness 1950-1980	-0.00663	-0.00584	-0.00508	-0.00851	-0.0106	-0.00438	-0.00948	-0.00687
	[0.00727]	[0.00723]	[0.00840]	[0.00858]	[0.00791]	[0.00747]	[0.00753]	[0.00750]
Schooling 25+ 1950-1980	0.00140	0.00144	0.000595	0.00123	0.00151	0.00107	0.000886	0.00140
	[0.00109]	[0.00108]	[0.00122]	[0.00131]	[0.00114]	[0.00115]	[0.00124]	[0.00110]
Exec. Constraints 1950-1980	-0.000177	-0.000084	-0.000430	-0.000163	0.0000547	-0.000266	0.000191	-0.000174
	[0.000864]	[0.000843]	[0.000979]	[0.000977]	[0.000933]	[0.000884]	[0.000944]	[0.000874]
Europe					0.00932			
					[0.00683]			
Asia					0.00282			
					[0.00644]			
WW2 Belligerent							0.00121	
							[0.00437]	
Gap 1946-1950	-0.0161**				-0.0121*		-0.0121*	
	[0.00732]				[0.00616]		[0.00616]	
Gap 1946-1950 (Negative Values)		-0.0254**						
		[0.0104]						
Gap 1946-1950 (Alternative 1)			-0.0138					
			[0.00944]					
Gap 1946-1950 (Alternative 2)				0.00213				
				[0.00342]				
Gap 1946-1950 x Europe						-0.0263*		
						[0.0136]		
Gap 1946-1950 x Asia						-0.0320*		
						[0.0162]		
Gap 1946-1950 x Rest						-0.00323		
						[0.0113]		
Gap 1946-1950 x WW2 Bellig.								-0.0147
								[0.0114]
Gap 1946-1950 x WW2 Non-Bellig.								-0.0172*
								[0.00997]
Observations	57	57	52	52	57	57	57	57
R-squared	0.396	0.410	0.334	0.307	0.420	0.424	0.337	0.397

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 6 - Cross-Sectional Growth Regressions - 2SLS

	(1)	(2)	(3)	(4)
Dependent Variable:	Growth 1950-1980	Growth 1950-1980	Gap 1946-1950	Growth1950-1980
Estimation Method:	OLS	OLS (Reduced-Form)	2SLS (1st-Stage)	2SLS (2nd-Stage)
pcGDP 1950 (logs)	-0.00691**	-0.00697**	0.0528	-0.00537*
	[0.00304]	[0.00303]	[0.0504]	[0.00313]
Pop. Growth 1950-1980	-0.387*	-0.226	-0.227	-0.233
	[0.200]	[0.236]	[3.939]	[0.224]
Invest. Share 1950-1980	0.0150	0.0210	-0.645*	0.00145
	[0.0229]	[0.0222]	[0.369]	[0.0242]
Gov. Share 1950-1980	0.0117	0.0144	-0.291	0.00552
	[0.0341]	[0.0340]	[0.566]	[0.0329]
Openness 1950-1980	-0.00663	-0.0130*	0.300**	-0.00386
	[0.00727]	[0.00726]	[0.121]	[0.00725]
Schooling 25+ 1950-1980	0.00140	0.00103	0.0232	0.00174
	[0.00109]	[0.00108]	[0.0179]	[0.00107]
Exec. Constraints 1950-1980	-0.000177	0.000101	-0.0227	-0.000588
	[0.000864]	[0.000841]	[0.0140]	[0.000882]
Gap 1946-1950	-0.0161**			-0.0303**
	[0.00732]			[0.0130]
Min. Dist. WW2 Battles (logs)		-0.00317**	0.105***	
		[0.00142]	[0.0237]	
Observations	57	57	57	57
F-statistic			19.526	
R-squared	0.396	0.398	0.520	0.349

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 7 - Panel Growth Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	10-year Growth Rates 1950-2000			5-year Growth Rates 1950-2000		
Initial pcGDP (logs)	-0.0323***	-0.0311***	-0.0378***	-0.0311***	-0.0298***	-0.0374***
	[0.00399]	[0.00422]	[0.00409]	[0.00387]	[0.00408]	[0.00411]
Pop. Growth (Period Average)	-0.429*	-0.436*	-0.383*	-0.658***	-0.661***	-0.645***
	[0.228]	[0.229]	[0.225]	[0.155]	[0.157]	[0.156]
Invest. Share (Period Average)	0.00126***	0.00125***	0.00135***	0.00150***	0.00149***	0.00163***
	[0.000198]	[0.000201]	[0.000194]	[0.000181]	[0.000185]	[0.000182]
Gov. Share (Period Average)	-0.000846**	-0.000843**	-0.000911**	-0.000934***	-0.000942**	-0.00102***
	[0.000378]	[0.000383]	[0.000374]	[0.000360]	[0.000366]	[0.000364]
Openness (Period Average)	0.000249***	0.000247***	0.000246***	0.000245***	0.000243***	0.000246***
	[7.09e-05]	[7.15e-05]	[6.90e-05]	[6.48e-05]	[6.54e-05]	[6.43e-05]
Schooling 25+ (Period Average)	0.000831	0.000938	0.000860	-0.00126	-0.00115	-0.00123
	[0.00163]	[0.00167]	[0.00159]	[0.00152]	[0.00157]	[0.00151]
Exec. Constraints (Period Average)	-0.000396	-0.000446	-0.000185	-8.74e-05	-0.000150	0.000111
	[0.000714]	[0.000721]	[0.000697]	[0.000637]	[0.000645]	[0.000635]
Gap/Instrument x 1950		-0.0121	-0.00341***		-0.0254	-0.00309***
		[0.0196]	[0.000863]		[0.0258]	[0.00119]
Gap/Instrument x 1955					-0.0196	-0.00307***
					[0.0253]	[0.00117]
Gap/Instrument x 1960		0.00933	-0.00267***		0.00792	-0.00260**
		[0.0188]	[0.000855]		[0.0249]	[0.00116]
Gap/Instrument x 1965					-0.00343	-0.00225*
					[0.0249]	[0.00116]
Gap/Instrument x 1970		-0.00118	-0.00218**		-0.000535	-0.00238**
		[0.0174]	[0.000843]		[0.0233]	[0.00115]
Gap/Instrument x 1975					-0.0111	-0.00159
					[0.0231]	[0.00115]
Gap/Instrument x 1980		0.00407	-0.00134		-0.00656	-0.00136
		[0.0173]	[0.000845]		[0.0230]	[0.00115]
Gap/Instrument x 1985					0.00288	-0.000751
					[0.0230]	[0.00114]
Gap/Instrument x 1990		0.0168	-0.000879		0.0130	-0.000374
		[0.0171]	[0.000817]		[0.0232]	[0.00113]
Gap/Instrument x 1995					0.00844	-0.000520
					[0.0231]	[0.00112]
Countries Dummies (p-value)	[0.0000]	[0.0002]	[0.0009]	[0.0000]	[0.0003]	[0.0007]
Period Dummies (p-value)	[0.0000]	[0.0006]	[0.1017]	[0.0000]	[0.0002]	[0.0548]
Dummies x Gap 1950 (p-value)		[0.7246]			[0.9338]	
Dummies x MinDist_WW2 (p-value)			[0.0017]			[0.0205]
(p-value dummies before 1980/1975)			[0.0009]			[0.0964]
(p-value dummies after 1980/1975)			[0.2272]			[0.5355]
Countries	57	57	57	57	57	57
Observations	316	316	316	631	631	631
R-squared	0.422	0.429	0.466	0.326	0.332	0.353

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 8 - Counterfactual Growth Rates

Panel A: Period 1950-1975

Period	1950-1955	1955-1960	1960-1965	1965-1970	1970-1975	Overall
Actual Growth Rate	0.0333	0.0276	0.0337	0.0340	0.0354	0.0328
No Reconstruction Counterfactual	0.0174	0.0118	0.0204	0.0224	0.0232	0.0191
No Cond. Convergence Counterfactual	0.0272	0.0228	0.0277	0.0277	0.0300	0.0271
No Openness Increase Counterfactual	0.0331	0.0277	0.0340	0.0343	0.0352	0.0329
No Institutional Improvements Counterfactual	0.0333	0.0277	0.0338	0.0341	0.0355	0.0329

Panel B: Period 1975-2000

Period	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	Overall
Actual Growth Rate	0.0236	0.0085	0.0179	0.0107	0.0254	0.0172
No Reconstruction Counterfactual	0.0154	0.0015	0.0109	0.0068	0.0234	0.0116
No Cond. Convergence Counterfactual	0.0192	0.0072	0.0149	0.0083	0.0210	0.0141
No Openness Increase Counterfactual	0.0232	0.0079	0.0171	0.0105	0.0251	0.0168
No Institutional Improvements Counterfactual	0.0236	0.0086	0.0179	0.0108	0.0254	0.0173

Table A1 - Cross-Sectional Growth Regressions - Additional Robustness Checks

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:			Growth Rate 1950-1980		
Estimation Method:		OLS		wOLS	RLS
pcGDP 1950 (logs)	-0.00691**	-0.00709**	-0.00714**	-0.00759**	-0.00608*
	[0.00304]	[0.00307]	[0.00306]	[0.00298]	[0.00307]
Pop. Growth 1950-1980	-0.387*	-0.411**	-0.421**	-0.425**	-0.685***
	[0.200]	[0.201]	[0.198]	[0.194]	[0.201]
Invest. Share 1950-1980	0.0150	0.0168	0.0169	0.0167	0.0269
	[0.0229]	[0.0231]	[0.0230]	[0.0226]	[0.0231]
Gov. Share 1950-1980	0.0117	0.0112	0.00994	0.0132	-0.0195
	[0.0341]	[0.0345]	[0.0345]	[0.0335]	[0.0344]
Openness 1950-1980	-0.00663	-0.00661	-0.00651	-0.00726	-0.00834
	[0.00727]	[0.00738]	[0.00737]	[0.00706]	[0.00733]
Schooling 25+ 1950-1980	0.00140	0.00136	0.00144	0.00120	-6.06e-05
	[0.00109]	[0.00110]	[0.00111]	[0.00105]	[0.00110]
Exec. Constraints 1950-1980	-0.000177	-0.000121	-0.000141	9.19e-05	0.000459
	[0.000864]	[0.000872]	[0.000872]	[0.000858]	[0.000872]
Gap 1946-1950	-0.0161**			-0.0150**	-0.0134**
	[0.00732]			[0.00723]	[0.00558]
Gap 1948-1950		-0.0143*			
		[0.00734]			
Gap 1950			-0.0143*		
			[0.00720]		
Observations	57	57	57	57	57
R-squared	0.396	0.384	0.386	0.414	0.375

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Figure 1 – The Pre- and Post-War Growth Trajectory of France

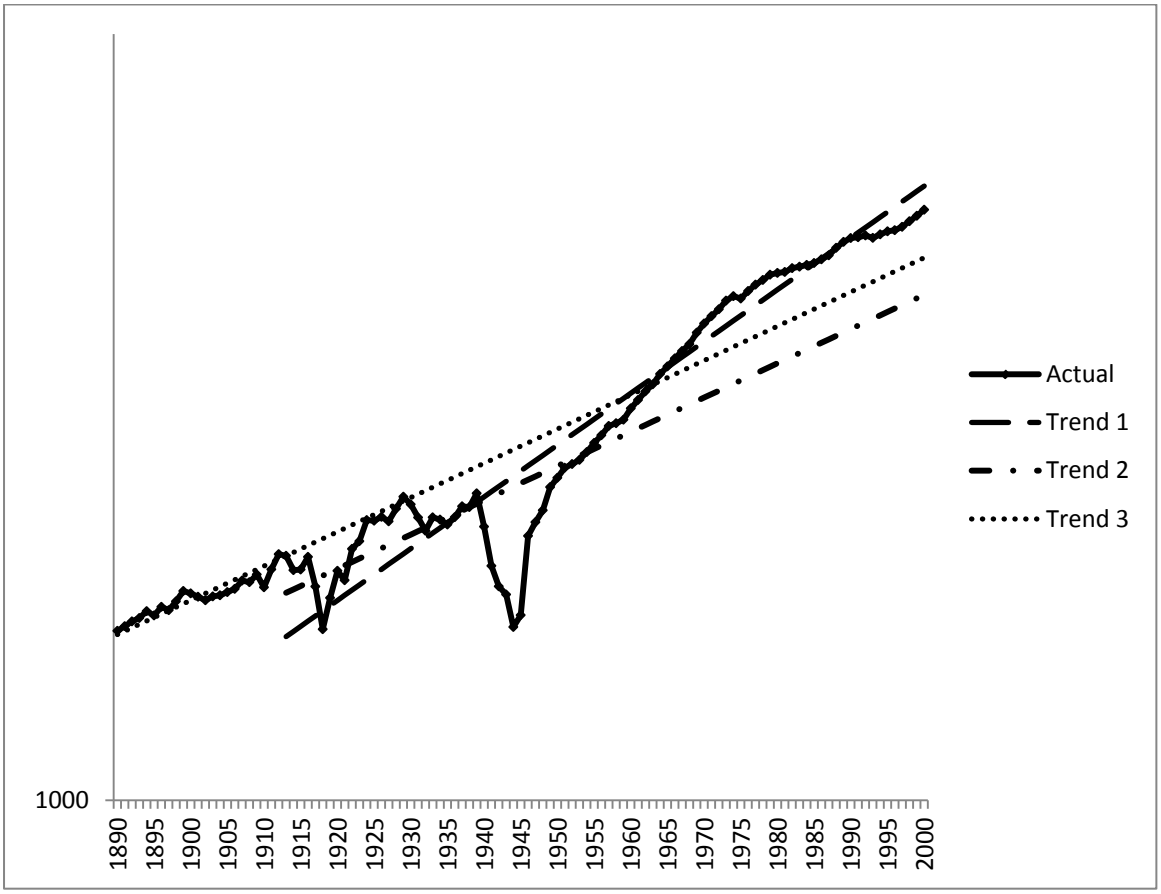

Figure 2 – The Pre- and Post-War Growth Trajectory of Germany

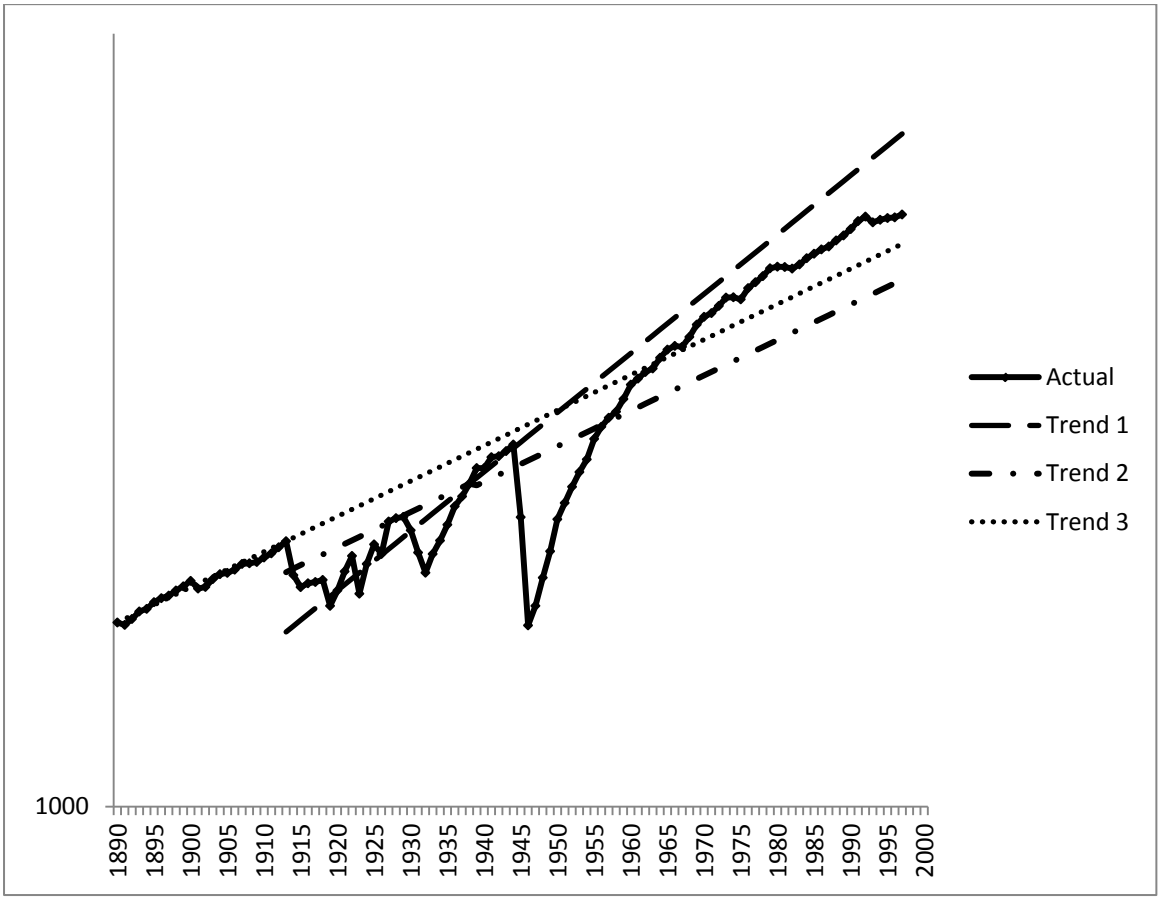

Figure 3 – Post-War Gaps and Growth Scatter Plot

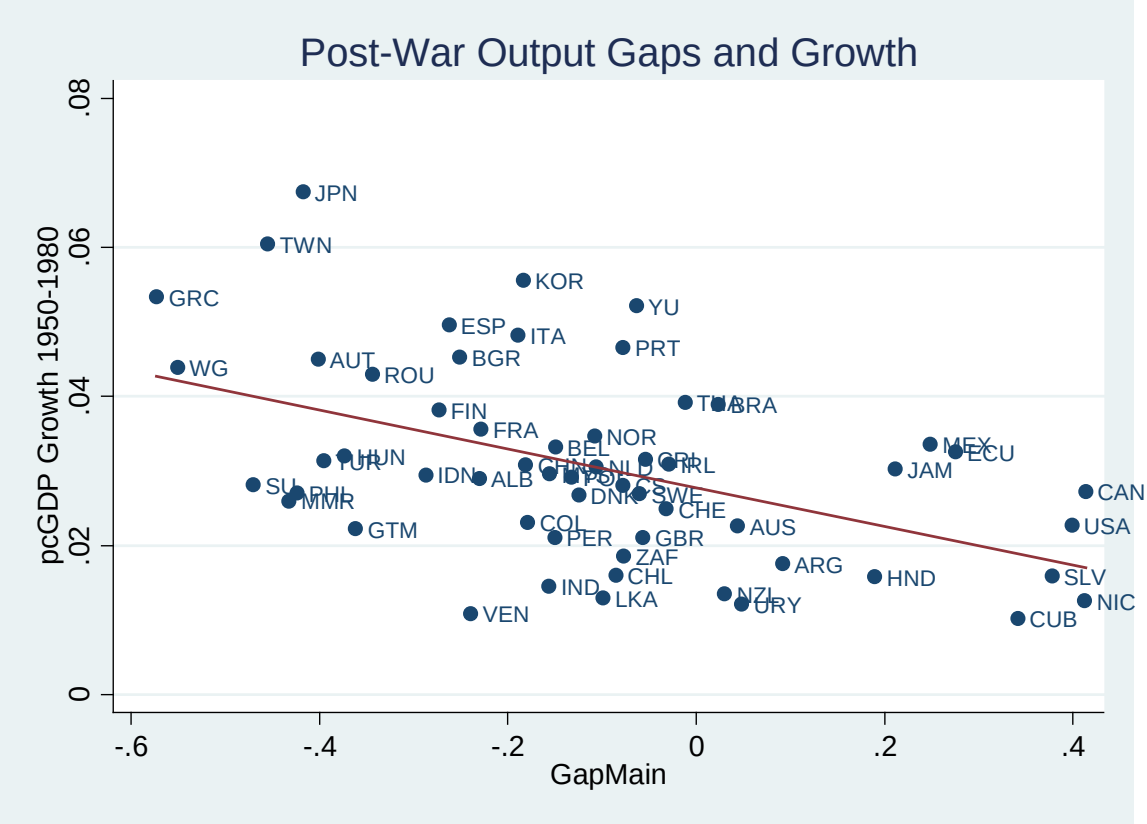

Figure 4 – Post-War Income Levels and Growth Scatter Plot