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Reconstruction Aid, Public Infrastructure, and Economic Development: The Case of the Marshall Plan in Italy

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Abstract

The Marshall Plan (1948–1952) was the largest aid transfer in history. This paper estimates its effects on Italy's postwar economic development. It exploits differences between Italian provinces in the value of reconstruction grants they received. Provinces that could modernize more their infrastructure experienced higher increases in agricultural production, especially for perishable crops. In the same provinces, we observe larger investments in labor-saving machines, the entry of more firms into the industrial sector, and a larger expansion of the industrial and service workforce.

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1 Introduction

The Marshall Plan, sponsored by the United States between 1948 and 1952 to help Europe recover from World War II, is the largest economic and financial aid program ever experienced in the world (Zamagni, 1997). It transferred to European countries $130 billion (in 2010 USD)—around 5 percent of US GDP in 1948—which was mainly used to provide immediate relief and to fund the reconstruction.[1] Economic historians have long recognized the importance of the Marshall Plan in developing pro-market institutions in Western Europe (for example, De Long and Eichengreen, 1993; Casella and Eichengreen, 1996; and Hogan (1987)). However, little is known about its causal effect on the recovery and development of local economies within European countries. The major empirical challenges that previously blocked this line of research were the lack of geographically detailed data on the use of Marshall Plan aid and the identification of quasi-random variation in the allocation of resources within recipient countries.

In this paper, we study how the Marshall Plan's investments in reconstruction affected the postwar economic development of Italian provinces. Italy was the third largest recipient of Marshall Plan aid. It received $12 billion between 1948 and 1952—on average, 2.3 percent of its GDP for five years (Fauri, 2006). The Marshall Plan encompassed three types of interventions: reconstruction grants to the Italian government for rebuilding public infrastructure (74 percent of total aid), in-kind subsidies during the first postwar years (24 percent), and direct loans to privately owned firms (2 percent). In this paper, we focus on the reconstruction grants, while controlling for the distribution of the other two forms of Marshall Plan aid.

We digitized data on all 14,912 Marshall Plan reconstruction projects in Italy, as well as data on war damage documented by US authorities between 1947 and 1949. We then matched this information with both prewar and postwar economic outcomes from the Italian Bureau of Statistics for the 91 provinces existing in 1952, as well as detailed data on Allied bombing during WWII compiled by the US Air Force.

We start our analysis by showing that there is a positive correlation between the amount of Marshall Plan grants received by a province and its post-war development. However, a potential concern of this analysis is that provinces that had ex-ante higher potentials may have been allocated more reconstruction funds. To solve the potential endogeneity of the OLS, we instrument the amount of reconstruction money with the intensity of Allied air

[1] To put the size of the Marshall Plan in perspective, consider the current level of US foreign aid. In fiscal year 2019, the United States Agency for International Development (USAID) will fully or partially manage $16.8 billion in assistance (https://www.usaid.gov/results-and-data/budget-spending). The Federal Emergency Management Agency (FEMA), which coordinates the response to domestic disasters, had a $15 billion budget for 2018 (https://www.dhs.gov/sites/default/files/publications/FEMA%20FY18%20Budget.pdf).

strikes in each province during the last stages of WWII. Specifically, we exploit a change from strategic to tactical Allied bombing following Italy's surrender in 1943. After its capitulation, Italy became an active warfront between the German army, coming down from the north, and the Allied army, moving up from the south. In this period, Allied air forces focused on tactical bombings intended mainly to help their ground troops break through enemy lines. The distribution of these tactical air attacks was mostly driven by war-related events, such as land battles and intelligence on movement of troops and supplies, not by other local factors, such as prewar economic conditions.

In addition to not being correlated with prewar economic characteristics and with the prewar stock of transportation infrastructure, post-armistice tactical bombings are a strong predictor of reconstruction grants during the Marshall Plan, because these bombings were often targeted at public infrastructure. A 1-standard-deviation increase in post-armistice tactical bombing tonnage (1,681 tons) is correlated with damage valued 21 percent higher and 22 percent more grant money. More than half of the Marshall Plan reconstruction funds (52 percent) were employed to rebuild Italy's road and railway networks. This finding is consistent with historians' accounts that identify Italy's broken transportation systems as the main constraint on its economic recovery (Fauri, 2006). Moreover, we show that greater bombing damage during WWII required that provinces build new infrastructure, instead of just restoring preexisting roads and railways. These findings support the hypothesis that more widespread destruction during the war decreased the opportunity cost of radical updates to the transportation system after the arrival of international grants.

We find three key results. First, the Marshall Plan had a positive effect on Italy's economic development. Provinces with more reconstruction funds experienced larger increases in agricultural production—between 10 percent and 20 percent for major crops. This effect started only after the completion of the first public infrastructure funded through the Marshall Plan, close to ten years after the first Allied air raids. This finding indicates that our main results are indeed driven by the reconstruction effort funded through the Marshall Plan, rather than stemming from other war-related events or the bombing itself. The fact that provinces with more bombings and greater damage were able to redesign their transportation system out of necessity played an important role. More efficient roads and railways allowed farmers to reach more distant markets more quickly, essentially increasing demand for their agricultural products. Consistent with this fact, the estimated effect of reconstruction grants is positive and large for perishable crops (a threefold increase for fruit with a short shelf-life), but not statistically different from zero for products with a very long post-harvest life (8 percent decrease for tree nuts).

Second, in addition to increased production, we observe structural changes to the labor

markets. In provinces with more reconstruction money, the number of agricultural workers decreased disproportionately by 21 percent. Manual labor was replaced with mechanical tools. We observe, for example, a fourfold increase in the use of tractors. General-purpose motorized machines had become increasingly important on American farms during the first half of the twentieth century, but their adoption in Italy was still low at the beginning of the Marshall Plan due to years of autarkic Fascist policies. It is therefore not surprising that more efficient transportation, and possibly higher profits, spurred agricultural firms to invest more in physical capital.

Third, workers who did not find postwar employment in agriculture were absorbed by the booming industrial and service sectors. In provinces with more reconstruction money, we also observe a larger increase in the number of active firms, especially those with fewer than ten employees. More efficient roads and railways might have decreased the barriers to entering the industrial sector.

This paper naturally contributes to the literature on the Marshall Plan. Previous papers have argued that the Marshall Plan created an environment in which democratic institutions could grow (as opposed to the communist system), but that its impact on investments in industrial capacity and infrastructure repairs was modest overall (Eichengreen et al., 1992; De Long and Eichengreen, 1993).[2] Our paper complements this set of findings by studying the effects of the Marshall Plan within a recipient country, instead of relying on cross-country comparisons. In this sense, our empirical setting is designed to keep macroeconomic changes at the national level fixed, while leveraging differences in the distribution of aid across local economies within a single country.[3] Within this microeconomic framework, our results suggest that the modernization of the transportation network played a role in explaining differences in postwar development across Italian provinces located within the same region. Therefore, in addition to affecting European political institutions, the Marshall Plan had a more direct effect on the development of local economies.

Moreover, this paper contributes to the literature on the economic effects of transportation systems. While existing papers discuss the benefits of massively expanding the road and railway networks in developing economies (Banerjee, Duflo, and Qian, 2012; Faber, 2014; Donaldson and Hornbeck, 2016; Morten and Oliveira, 2017; Donaldson, 2018), our setting presents two main differences. First, in spite of the hardships caused by the war, postwar

[2] Section 2.2 includes more details about the historical literature on the Marshall Plan.

[3] Although our empirical strategy is not designed to capture country-level changes, we observe shifts in voting behavior that are consistent with previous findings. Provinces with more reconstruction funds had higher shares of votes for the pro-US Christian Democratic Party after the Marshall Plan.

Italy had one of the highest GDPs per capita in the world.[4] Second, the Marshall Plan mainly led to a modernization of the existing infrastructure stock, rather than to a huge growth in the network. In other words, our results might be more informative for modern developed countries that want to update their increasingly inadequate transportation systems than for developing countries that intend to massively expand their limited network (European Investment Bank, 2017; TRIP, 2018).

This paper contributes to two additional strands of the literature. First, we contribute to the literature on the returns on investments in public infrastructure (see Romp and De Haan, 2007 for a survey). Most previous papers in this field correlate variation in public spending across countries or over time to economic outcomes. In contrast, we leverage variation in public spending both over time and across small geographical areas within a single country.

Second, this paper contributes to the literature on the economic consequences of bombings. Previous work has examined the effects of aerial bombings on urban development (Davis and Weinstein, 2002), poverty rates (Miguel and Roland, 2011), military and political activities (Dell and Querubin, 2017), the creation of scientific knowledge (Waldinger, 2016), and education (Akbulut-Yuksel, 2014, Riaño and Valencia Caicedo, 2020).[5] In the context of postwar Italy, our paper shows that, after a bombing campaign, foreign aid can generate a large economic expansion beyond the scope of simple mean reversion, even within otherwise similar macro regions.

2 Historical Background

2.1 The Italian Campaign

Nazi Germany's invasion of Poland on September 1, 1939, marked the beginning of World War II. Despite being an Axis power, Italy remained nonbelligerent until June 10, 1940, when it declared war on France and Great Britain. The country was first bombed on the night of June 11, 1940, when Great Britain hit the northwestern city of Turin. The last aerial attack occurred in early May 1945, when the Allies bombed the railways and roads near the Brenner Pass, on the border with Austria, to kill German troops fleeing the country.

Bombing in Italy can be divided into two periods: before and after the Italian armistice with the Allied forces. During the first phase of the war, between June 11, 1940, and September 3, 1943, the Allies relied on strategic bombing. Air raids targeted industries in largely

[4] In 1950, for example, Italy had the 26th highest GDP per capita out of 140 countries (data available at `https://www.rug.nl/ggdc/historicaldevelopment/maddison/data/mpd2018.xlsx`). The same caveat applies if we consider the contributions of our findings to the debate on the efficacy of foreign aid (Qian, 2014).

[5] In Italy, Fontana, Nannicini, and Tabellini (2017) showed how a more prolonged Nazi occupation led to higher postwar support for the Communist Party after the war.

populated areas, "where the effects of air attack will be brought home to the largest portion of the population."[6] By destroying jobs and homes, the Allies wanted to depress the morale of the urban population, generate dissatisfaction with the Fascist regime, and wreck industrial firms that had been readapted to produce military equipment. The British War Cabinet was convinced that "even a limited offensive against Italy would have a big morale effect."[7]

On September 3, 1943, Italy signed the Armistice of Cassibile with the Allied forces. The armistice, made public on September 8, 1943, opened a new active warfront on Italian soil between the German and Allied armies. The armistice gave new momentum to the Italian Campaign, a term referring to the successful Allied invasion of Italy. The Allies moved into mainland Italy from the southern island of Sicily. At the same time, German troops, which had arrived in Italy in July 1943, took control of most of the Italian peninsula and disarmed Italian soldiers. In this stage of the war, Allies resorted to tactical bombing to facilitate ground operations and destroy the occupying German forces. Preferred targets were troop concentrations, railways, and roads (Baldoli and Knapp, 2012).

The war in Italy formally ended on May 2, 1945. That year, Italian GDP per capita was 38 percent lower than the value observed in 1938, while industrial production was 66 percent lower (Lombardo, 2000). Immediately after the end of the war, damaged public infrastructure represented the main obstacle to recovery: 70 percent of the roads had been damaged and 45 percent of the railroad system was no longer usable (Fauri, 2006). It was therefore difficult for firms to obtain raw materials from suppliers and to distribute their products to clients. In contrast, firms' physical capital had been only marginally affected by bombing: estimates suggest that between 80 and 90 percent of the Italian industrial capacity survived the war (Grindrod, 1955; Zamagni, 1997; Fauri, 2006).

New infrastructure was desperately needed, but Italy lacked the funds to start reconstruction.[8] This situation changed when US Secretary of State George C. Marshall, in his commencement speech at Harvard University on June 5, 1947, announced an assistance program for Europe. This program was formally approved by the US Congress in March 1948 through the passage of the Economic Cooperation Act. Known formally as the European

[6] TNA AIR 20/5304, Note by C.A.S., April 29, 1940.

[7] TNA CAB 65/6/50, War Cabinet conclusion, April 27, 1940.

[8] Unlike in other European countries, the reconstruction effort did not start significantly in Italy before the Marshall Plan. Most pre-Marshall-Plan aid arrived through the United Nations Relief and Rehabilitation Administration (U.N.R.R.A.) program between 1944 and 1946 (Harper, 2002). The scope of the U.N.R.R.A. in Italy was "limited to the feeding of undernourished children, to medical care, and to assistance to displaced persons and refugees to return to their homes" (https://www.cvce.eu/content/publication/1999/1/1/fadaad01-d20a-4e05-906a-8f9495ab79cf/publishable_en.pdf). As a result, the country did not get pre-Marshall-Plan aid for reconstruction. Both Fauri (2006) and Lombardo (2000) agree that road and railroad reconstruction did not start before the Marshall Plan.

Recovery Program (ERP), and informally as the Marshall Plan, it was signed into law by President Truman in April 1948. The main goals of the ERP were (1) rebuilding and repairing European infrastructure; (2) increasing production, expanding foreign trade, and controlling inflation; (3) facilitating European economic cooperation and integration; and (4) preventing the expansion of communism (Boel, 2003). The ERP remained in operation from March 1948 to June 1952,[9] and granted $130 billion (in 2010 USD) to seventeen western and southern European countries.

2.2 Prior Studies on the Marshall Plan

The impact of the Marshall plan on the European recovery is a hotly debated topic in the economic history literature. On the one hand, early triumphalist accounts (Jones, 1955; Mayne, 1970; Arkes, 1972) describe the Marshall Plan as vital for the reconstruction of productive capacity, the development of the necessary institutions for cooperation among former adversaries, and the restoration of the European confidence in market capitalism. In the words of Mayne (1970), Marshall Plan aid "was a precondition of all later affluence and economic miracles, as well as moves toward European unity." On the other hand, Milward (1984) discounts the importance of ERP transfers arguing that the recovery was well under way before 1948 and the reconstruction of the damaged private and public capital stocks was almost completed.

While these first reports were mainly qualitative in nature, the first empirical studies seemed to support the thesis that the Marshall Plan had a direct effect on development. Specifically, several papers highlighted the role of the Marshall Plan in promoting financial stabilization, market liberalization, and the social contract on which the economic miracle was based. In particular, Eichengreen et al. (1992) finds that US aid had a significant impact on Europe's recovery from WWII: the recipients of large amounts of Marshall aid recovered significantly faster than other industrial countries. Strikingly, however, it finds that the obvious channels through which the Marshall Plan could have affected European recovery—stimulating investment, augmenting capacity to import, and financing infrastructure repair—were relatively unimportant. Rather, the crucial role of the Marshall Plan was to facilitate the restoration of financial stability and the liberalization of production and prices. Casella and Eichengreen (1996) argues that the Marshall plan helped bring monetary stabilization to recipient countries. De Long and Eichengreen (1993) finds that the Marshall Plan did play a role in alleviating resource shortages, but this channel was not strong. More

[9] The end of the ERP did not mean the end of US aid to Europe. In 1952, the Economic Cooperation Act was replaced by the Mutual Security Program (MSP), which pursued both economic and military goals. The MSP sponsored the US Technical Assistance and Productivity Program (USTA&P), whose long-term effects in Italy are analyzed in Giorcelli (2019).

importantly, the Marshall Plan significantly sped Western European growth by altering the environment in which economic policy was made.

In a similar vein, Hogan (1987) argues that the Marshall Plan was an outgrowth of organizational, economic and political trends that had already forged American business methods before WWII. More specifically, Hogan (1987) argues that the Marshall Plan aid was mostly intended to make Western Europe's economy more similar to the mixed capitalist economy of the US. More recently, Steil (2018) emphasizes that the Marshall Plan was a way for the US to stabilize the continent without long-term economic and security commitments. Although anticommunism and the Keynesian approach to capitalism animated the effort, Steil (2018) points out that the Marshall Plan also helped to sell American products to European economies.

In short, most of the cross-country evidence on the Marshall Plan indicates that the program played an important role in spurring the economic recovery of recipient European countries. However, there is not a consensus on the mechanisms through which it worked. Single-country studies provides similar insights. Focusing only on Italy, Fauri (2006) argues that the Marshall Plan was the precondition of the economic miracle, as it fostered industrial development and helped Italian integration in Europe. Knapp, Stolper, and Hudson (1981) analyzes the Marshall Plan in Germany and concludes that it helped reinvigorate the growth of the Germany industry by updating outdated industrial policies.

This paper contributes to this rich economic literature in several ways. First, it represents one of the first attempts to use newly digitized data on the allocation of Marshall Plan funding within one recipient country to study the effect of the program on local development. Second, it uses data on Allied bombings to leverage plausibly exogenous variation in the local amount of reconstruction grants, rather than focusing only on correlations. Third, it highlights the reconstruction of transportation infrastructure as another important mechanism for local growth, in addition to the other factors explored by prior studies.

2.3 Details About the Marshall Plan in Italy

All Western and Eastern European countries were eligible to receive funding from the Marshall Plan, but only 17 countries decided to participate: Austria, Belgium, Denmark, France, West Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, and the United Kingdom. Out of a total budget of $130 billion (in 2010 USD), the three countries that received the most money were France (20.8 percent), Germany (10.9 percent), and Italy (10.6 percent) (ECA, 1951).[10] Between May

[10]Every monetary value in this paper is expressed in 2010 USD. The deflator used to convert the value of USD across years is the consumer price index indicator provided by https://www.measuringworth.com/calculators/uscompare/.

1948 and June 1952, Italy received around $12 billion from the United States, 11.5 percent of its 1948 GDP or an average of 2.3 percent of its GDP for five years.

Italy received three types of aid: financial grants, in-kind subsidies, and loans. Data on financial grants, the focus of this paper, come from the "Mutual Security Agency" bulletins (Figure A1, panel B). In addition to the amount of grant money paid to the Italian government, these reports describe the type, cost, and location of each reconstruction project financed through ERP aid. Financial grants represented 74 percent of ERP aid and were used to finance 14,912 projects. Moreover, we collected data on in-kind subsidies from the report *"Missione Americana per l'ERP in Italia"* (American E.R.P Mission in Italy), which lists quantities and monetary value of the goods transferred to each Italian province between March and December 1948 (after which the delivery of in-kind aid stopped). The in-kind subsidies were mainly food (flour and wheat), medications, raw materials (coal, oil, and cotton), and machinery (Figure A1, panel C), representing 24 percent of total ERP aid. Finally, we hand-collected and digitized data on loans received by each Italian firm from 1948 to 1952; the data were stored at the historical archive of the *Istituto Mobiliare Italiano* (IMI). For each grantee, the data specify the amount of the loan, the origination date, and the repayment schedule. Loans represented only 2 percent of US aid and were allocated across 1,101 large Italian firms. Due to the fact that they represented the main source of funding, we primarily focus on the reconstruction grants, although we also include controls for the other forms of aid disbursed through the Marshall Plan.

The American authorities kept a tight control on the whole funding process. First, the US government collected detailed data on both the state of the Italian economy and the lingering problems left by the war through the so-called *Italy Country Study*. After this initial assessment, the US Economic Cooperation Administration (ECA) and the Italian government jointly elaborated annual programs, each divided into four quarters, during the five years (1948-1952) in which the Marshall Plan actively disbursed funds. These annual and quarterly programs used the results from the Country Study to identify the main economic and geographical areas that needed funding. Each quarter, the ECA approved each individual project to be financed with ERP funds without further influence from the Italian government. Within twenty days of approval, the ECA had to transfer the grant money to the Italian government, which in turn had to start the project within four months of receiving the funds (Fauri, 2006).

We can use the newly digitized data on reconstruction grants in Italy to test the popular theory that the US authorities used the funds of the Marshall Plan to steer the receiving countries away from the communist ideology. Specifically, we can study whether and by how much province-level reconstruction grants correlate with voting outcomes in the two

democratic elections that occurred between the end of the war and the start of the Marshall Plan (1946 and 1948). Overall, the results indicate that local political trends did not have a strong predictive power for the level of reconstruction grants during the Marshall Plan (Table A1, columns 1 and 3). None of the province-level shares of votes received by the five largest political parties in the 1946 and 1948 national elections have a statistically significant relationship with the province-level amount of reconstruction grants. Moreover, we can rule out that vote shares received by the main leftist parties and coalitions, which include the Italian Communist Party, are associated with different levels of grants after 1948.

Finally, the fact that the US authorities accepted each individual project and closely monitored the disbursement of funds suggests that local lobbying and corruption should not have played a major role in the allocation of resources. Although data on corruption in the postwar years are not available, it should be noted that all our main specifications are going to include region-year fixed effects, which capture most of the intra-national variation in the level of corruption. However, although corruption may not be relevant, there are many other factors that affected the decision to allocate more funds to certain provinces and may be correlated with postwar economic development. For example, the US authorities may have decided to allocate more reconstruction grants to more populous areas. Therefore, Section 5 will outline an empirical strategy to leverage plausibly exogenous variation in reconstruction grants.

3 Data

3.1 Italian Censuses

The *Censimento dell'Industria e dei Servizi* (Industrial Census) provides information on the number of firms and workers in different Italian industries for the 91 provinces that existed in Italy in 1951.[11] We focus on nine major industries in the Italian economy—food, paper, chemicals, construction, mining, manufacturing, metallurgy, textile, and clothing—that employed 59 percent of the total industrial workforce in 1937. Two prewar observations, in 1927 and 1937, indicate that on average each province had 704 active firms and 3,969 employed workers per industry (Table 1, panel A, column 1). Six postwar observations (each one over ten years from 1951 to 2001) indicate a large increase in the size of Italian industry (Table 1, panel A, column 2).

This expansion of the industrial workforce came at the expense of the agricultural sector. The average number of agricultural workers by province decreased by 53 percent, from 96,447 before the war to 45,206 between 1951 and 2001. The *Annuari di Statistica Agraria* (Annals

[11] Provinces are Italian administrative divisions comparable to US counties. They are on an intermediate level between municipalities (smaller) and regions (larger).

of Agricultural Statistics) provide additional information on the production of different crops and on the adoption of agricultural inputs for each year between 1937 and 1969. Despite a shrinking workforce, the agricultural sector increased its production after the end of WWII. This increase in production was accompanied by the adoption of newer technology, such as tractor-powered machines.

We also digitized the yearly *Bollettini della Proprietà Intellettuale* (Bulletins of Intellectual Property) from 1938 to 1962. These documents contain information about all patents issued by the Italian Patent Office to domestic and foreign inventors. The average number of patents per province issued yearly to local inventors increased from 62 in 1938 and 1939 to 76 between 1946 and 1962.

Finally, the *Censimento Generale della Popolazione* (Population Census) provides information on the number and characteristics of individuals living in each Italian province before the war (in 1931 and 1936) and after the war (one observation every ten years from 1951 to 2001).

3.2 Allied Bombing and Consequent Damage

We retrieved detailed information about Allied bombing in Italy from the Theater History of Operations Reports (T.H.O.R.; Lt Col Robertson, Burr, and Barth, 2013), compiled by the US Air Force Research Institute. For each Allied air strike executed in Italy during WWII, this database lists the location, the date, the type of target, and the amount of explosives in tons. Out of 84 countries targeted by at least one Allied air raid, Italy was the second hardest hit country after Germany. Throughout WWII, Italy was hit by 20,517 air attacks (13 percent of all Allied air raids) and by 415,374 tons of bombs (10 percent of all Allied bombs). In comparison, Germany received 57,509 air raids and 1,981,034 tons of bombs, while Japan, the third member of the Axis Alliance, received 2,788 air raids and 187,570 tons of bombs.

We further focus only on air attacks with information on the targeted province to measure the intensity of bombings in different parts of Italy. Bombings affected most geographical areas (Figure 1, Panel A). The province of Rome, the Italian capital, received the most explosives (25,748 tons), while the province of Vercelli in the northwestern region of Piedmont received the least (16 tons). Out of 5,771 attacks with information on the targeted province, the Allied forces used 402,045 tons of explosives against targets on Italian soil (Table 1, panel B, column 1).

By using the date of the attack and the type of target, we could isolate the tactical air strikes that were executed in support of ground operations against German troops during the Italian Campaign. We first considered only attacks that took place after February 1944,

because in this period support for land battles in Italy became the top priority of the Allied Tactical Air Forces.[12] We then selected target types linked to operations against the German Army: direct cooperation with Allied ground forces, German troop concentrations, radar installations, gun emplacements, weapon launching sites, tactical targets, supply dumps, train tracks and marshaling yards; moving trains, highways, and vehicles, and transportation facilities.

The distribution of these bombings followed the land battles of the Italian Campaign and the progressive retreat of German troops toward Austria. The most heavily affected areas connect the central provinces in the Lazio region on the so-called Gustav line (a series of German fortifications around the town of Cassino), the provinces in the Tuscany and Emilia-Romagna regions on the so-called Gothic line (a second German entrenchment), and the provinces leading to the Brenner Pass on Italy's northeastern border with Austria (Figure 1, Panel C). In contrast, the strategic bombings that predated the Armistice of Cassibile had targeted the richest and most populated areas across all Italian regions (Figure 1, panel B).

Late in the Italian Campaign, the Allied air forces used 82,520 tons of explosives against targets on Italian soil in 1,332 attacks (Table 1, panel B, column 2). Of the 57,722 tons of explosives used in support of ground operations, 44,308 tons (77 percent) were dropped after February 1944. Similarly, of the 74,332 tons of explosives used to target transport infrastructure, 38,212 tons (51 percent) were dropped during the Italian Campaign.

Data on war damage come from the 1947 and 1949 "Italy's country studies," compiled by the ECA to document the condition of Italian public infrastructure. These data provide the monetary value of war-related damage to public infrastructure, as well as the share of roads and railways that were deemed unusable by US officials.[13] War-related damage was highly correlated with bombings, especially tactical ones during the Italian Campaign (Figure A2, panel A). This is consistent with the fact that these air attacks often targeted transportation infrastructure. In contrast, the share of roads and railways that were unusable, although high, was not correlated with bombings (Figure A2, panel B and C). Consistent with the historical literature (Fauri, 2006), this finding suggests that the damage from WWII substantially decreased the efficacy of Italian transportation systems, even in areas with fewer bombings.

4 The Reconstruction Effort

In this section, we show that more intense tactical bombing during the Italian Campaign is associated with the granting of more reconstruction funds. Moreover, areas with greater

[12] TNA WO 204/ 930, Allied Force Headquarters, Inter-Services Supply Committee Paper, March 3, 1944.

[13] To be considered unusable, a portion of the road or railway did not necessarily have to be destroyed itself, since it could have been cut from the rest of the network by bombing on other parts of the line.

wartime destruction were able to carry out a more radical modernization of their transportation network—of necessity—after receiving aid through the Marshall Plan.

4.1 The Correlation Between Allied Bombing and ERP Aid

The destruction of Italian railroads and roads after WWII was major: according to both the 1947 and 1949 Italy Country Study by the ECA, 77 percent of roads and 44 percent of railroads were classified as unusable. Provinces with more bombings during the Italian Campaign suffered significantly more damage to public infrastructure during WWII. A 1-standard-deviation (σ) increase in the tons of explosives dropped (1,681 tons) correlates with an additional $8.8 million (in 2010 USD) in damages, a 21 percent increase from the mean (Table 2, column 1, panel A). However, intensity of bombings did not translate into differential disruption of the local transportation networks. A 1-σ increase in bombings correlates with only 0.17 percent fewer unusable roads and 0.84 percent fewer unusable railways (Table 2, column 2 and 3, panel A). These findings indicate that Allied air attacks during the Italian Campaign did more damage, but the bombings were sufficiently intense across provinces to disrupt transportation networks to a similar extent (Fauri, 2006). Consequently, if the lack of an efficient transportation network was indeed one of the main obstacles to recovery, we do not expect to observe differential economic development across provinces between the end of WWII and the beginning of the Marshall Plan.

The situation changed during the implementation of the Marshall Plan. Provinces that had suffered more bombings and greater damage received significantly more reconstruction funds. A 1-σ increase in the tons of explosives dropped correlates with an additional $17 million assigned for reconstruction projects, a 22 percent increase from the mean (Table 2, column 4, panel A). It is interesting to note that heavily bombed provinces received more reconstruction grant money at the expense of other forms of aid, such as in-kind subsidies (Table 2, column 5, panels A and B). The amount of explosives is also positively correlated with the value of loans given to private firms, but the relationship is small and not robust to the inclusion of province characteristics (Table 2, column 6, panels A and B). Our analysis will be able to isolate the effect of reconstruction grants from the influence of other forms of ERP aid. Robustness checks will directly include controls for non-reconstruction funds. Moreover, event studies will show that the effects on the local economies coincide with the completion of the first large reconstruction projects.

4.2 The Characteristics of Funded Projects

Not all funds arrived immediately after the Marshall Plan began. As outlined in Section 2.3, each year between 1948 and 1952, the ECA set a national quarterly budget and picked the

projects to fund according to the results of a yearly Country Study (ECA, 1951). Italian officials could predict neither prospective budgets nor the program's duration.

Regardless of the amount of bombing they had received, all provinces employed most of their funds to reconstruct their transportation network. The average Italian province used 52 percent of their ERP grants for transportation infrastructure, 32 percent for public buildings, and only 15 percent for sanitation (Table 3).[14] This focus on improving transportation did not depend on the intensity of tactical bombings during the Italian Campaign and, therefore, not on the total amount of reconstruction funds either. This result is additional evidence that damage to the transportation network was one of the main obstacles to Italian recovery.

Even though all provinces directed approximately the same share of grants toward the reconstruction of their transportation infrastructure, there were large differences in the total amount of resources per province. As a result, provinces that received more grant money could fund a higher number of interventions. Provinces in the top quintile of the distribution of tactical bombings completed an average of 108 projects between 1948 and 1952, while provinces in the bottom quintile completed only 69 projects, on average. The discrepancy between the top and bottom quintiles increased over time, peaking in 1952. The average cost of completed interventions in provinces with more Allied bombings, however, was significantly lower; the average cost per project was $1.3 million in the top quintile and $2.1 million in the bottom quintile. These results suggest that all provinces were able to fund some of their larger interventions. However, provinces that received more grant money could also complete a higher number of smaller projects.

The data indicate that widespread destruction became an opportunity for modernization with the arrival of international aid. Because WWII destroyed a larger portion of their infrastructure, provinces in the top quintile of tactical bombings were able to use their ERP aid to fully update their transportation network.[15] Instead of just rebuilding preexisting roads and railways, they could redesign their transportation system from the ground up. And their modern infrastructure then gave economic activities located in these provinces a key advantage at a turning point in Italian history, when the country fully opened to international trade for the first time after decades of Fascist autarkic policies.[16]

If the project description used words such as *new construction*, *extension*, or *modernization*, we classify the project as new infrastructure. By contrast, if it contained words such as *reconstruction*, *restoration*, or *reactivation*, we consider the project as a restoration of the

[14] These results are also available in regression (Table A2) and graph formats (Figure A3).

[15] The fact that destruction might generate radical improvements by lowering opportunity costs has been observed in other historical events, such as the Great Boston Fire of 1872 (Hornbeck and Keniston, 2017).

[16] Consider, for example, the low level of exports (Figure A4, panel A) and imports (Figure A4, panel B) or the non-increasing stock of transportation infrastructure (Figure A4, panel C) in the years before WWII.

existing infrastructure. The average province in the top quintile used 80 percent of its ERP funds to build new projects, while the average province in the bottom quintile committed 98 percent of its budget to the reconstruction of old infrastructure. Almost all new projects were aimed at modernizing the transportation network. Of all funds for new infrastructure, the share used for transportation was 96 percent in the top quintile and 100 percent in the bottom quintile. Moreover, provinces in the top quintile could fund new projects as early as 1948, while provinces in the bottom quintile had to wait until 1952. This result indicates that the ECA first funded the reconstruction of old infrastructure in geographic areas with limited damage.

Italian newspapers provide many anecdotes of updated infrastructure that had positive effects on local economies. In many cases, the modernization of a preexisting railroad entailed the addition of a second track, allowing the local transportation network to accommodate much higher traffic levels. Similarly, preexisting roads heavily damaged by Allied bombing received additional lanes. For instance, Marshall Plan aid was used to rebuild and expand the Carmagnola-Fossano railroad in the province of Turin, an area that experienced widespread destruction during the war. Prior to the reconstruction of this railway, traveling between Turin and the closest coastal city, Savona, was extremely difficult, requiring up to seven hours to cover only 259 km.[17] The reconstruction of the railroad, paired with the addition of a second track, was instrumental in better connecting Turin with all of southern Piedmont and the nearby region of Liguria. Upon its completion in 1956, a local newspaper noted how the updated railroad allowed local winemakers to more easily transport their products to other local markets.[18] Appendix B discusses other examples.

In order to move beyond anecdotal evidence, we digitized the Italian road and railroad network just before WWII and immediately after the Marshall Plan (Figure A5). We use these data to measure how access to the main local economic centers, the provincial capitals, changed over time in each province. Specifically, we regress the average or median post-WWII change in commuting distance between the provincial capital and each municipality within a province on the amount of reconstruction grants assigned to each province. A 1-σ ($15 million) increase in the reconstruction grants used for the transportation infrastructure is associated with a 22-kilometer decrease in the mean commuting distance to the provincial

[17] Source: Archivio Storico La Stampa (http://www.archiviolastampa.it/component/option,com_lastampa/task,search/mod,libera/action,viewer/Itemid,3/page,4/articleid,0003_15_11_1949), accessed on 10/22/2019. Its translation is in Appendix B.

[18] Source: Archivio Storico La Stampa (http://www.archiviolastampa.it/component/option,com_lastampa/task,search/mod,libera/action,viewer/Itemid,2/page,5/articleid,0008_09_106_1957), accessed on 10/22/2019. Its translation is in Appendix B.

capital, a 1-σ reduction in the commuting distance (Table A3, column 2, panel A).[19] These results hold if we use the median change in commuting distance (Table A3, panel A, columns 5 and 6) or if we consider only municipalities that were already connected to the network before WWII (Table A3, panel B). Consistent with the previous anecdotes, our findings indicate that provinces that received more grants for their transportation system were able to establish a quicker connection to their major local economic center, the provincial capital, after the Marshall Plan.

5 Identification

In this section, we show how the geographical distribution of Allied tactical bombings was not driven by preexisting economic conditions, but rather followed the confrontations between Allied and German troops. As a consequence, two adjacent provinces with similar economic conditions might have received vastly different numbers of air strikes during the latter stages of the war.

5.1 The Distribution of Allied Bombings Across Italian Provinces

After the Armistice of Cassibile on September 3, 1943, the Allied military strategy against Italy changed from strategic to tactical bombing (Figure 1, panels B and C). As noted earlier, pre-armistice bombing was primarily strategic: the Allies mainly targeted factories in densely populated areas to destroy military production and to weaken Italian morale. These first air strikes focused on the richest, most economically developed Italian provinces. There is a positive relationship between the explosive tonnage dropped before the armistice in each province and its prewar economic features. Out of 22 proxies for prewar economic characteristics, 16 variables are significantly correlated with the amount of explosives dropped by Allied forces before the armistice (Table 4, column 1).

Even if more bombings before the armistice resulted in more ERP aid after the war, we avoid this source of variation in the empirical analysis. The stark differences in prewar economic conditions between provinces receive more or less strategic bombing would not allow us to isolate the role of the Marshall Plan on postwar recovery. Provinces that were more economically successful before the war, in fact, might have flourished after the war for a variety of reasons, and not only thanks to ERP aid. Our empirical analysis exploits, instead, the shift to tactical bombing that followed the Armistice of Cassibile.

We test whether prewar economic conditions are correlated with the amount of tactical bombing used during the Italian Campaign (Table 4, column 2). Variables measuring pop-

[19] An increase in the reconstruction grants used for other types of infrastructure is not correlated with shorter commuting distance to the provincial capital.

ulation, size of the province, number of industrial firms, agricultural output, and number of patents before the war cannot explain significant variations in the severity of tactical air strikes during the Italian Campaign.[20] In addition to similar economic conditions, provinces with different intensity of tactical bombing also had similar levels of prewar political participation.[21] Similarly, the geographical characteristics of a province, such as elevation or share of coastal municipalities, do not predict different levels of bombings during the Italian Campaign. Even the length of railroads in 1931 and the length of roads in 1938 in each province are not associated with more intense air strikes. These findings indicate that the mere presence of a more developed transportation network in a province was not sufficient to draw more bombings during the Italian Campaign.

Then what *did* predict more tactical air attacks? The moving location of the warfront, first on the Gustav Line in central Italy and then on the Gothic Line in northern Italy, partially explains why some provinces received more tactical bombings. Provinces above the Gustav Line, for example, were hit on average by 1,178 additional tons of bombs. The remaining variation in bombings between provinces above the Gustav Line is correlated with the movement of German troops and supplies. Overall, these findings suggest that the extent of tactical bombing in a province during the Italian Campaign mostly depended on war-related events, such as the movement of the warfront, rather than on its prewar economic conditions.

5.2 Empirical Specifications

We first estimate the following OLS specifications:

$$\begin{aligned} y_{pt} &= \alpha_p + \gamma_{rt} + \delta \text{Reconstruction grants}_p \times \text{Post 1952}_t \\ &\quad + \sum_{z=1}^{3} \text{trend}_t^z \times \text{Econ}_p + \sum_{z=1}^{3} \text{trend}_t^z \times \text{War}_p + \epsilon_{pt}, \end{aligned} \tag{1}$$

where the unit of observation is province p and census year t.[22] Standard errors are clustered at the provincial level.

The dependent variable y_{pt} is one of many measures of agricultural or industrial out-

[20] Of the 22 economic outcomes we observe, in only one case (number of tractors used in agriculture) is the correlation between prewar output and tons of explosives positive and statistically significant.

[21] Voter turnout in the 1934 elections, a variable that measures affinity with the Fascist dictatorship, is not correlated with tactical bombing. Moreover, tactical bombing is not correlated with the outcome of the first two postwar democratic elections (Table A1, columns 2 and 4).

[22] The estimating sample drops provinces in the regions of Sicily and Sardinia due to the lack of bombings during the Italian Campaign, but the results are robust to their inclusion (Section 7.1).

put obtained from the Italian Bureau of Statistics.[23] The regressions control for nonlinear differences in industrial outcomes by including fixed effects for provinces (α_p), and fixed effects for combinations of regions and census years (γ_{rt}). In addition, equation (1) includes interactions between prewar provincial characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers in 1937) and trends up to the third order. These variables (Econ_p) account for time-varying nonlinear output changes that are correlated with economic conditions observed before the start of the conflict. Finally, these regressions control for another war-induced effect (War_p): the loss of human capital.[24] Specifically, equation (1) includes interactions between the share of war-related deaths in the province and trends up to the third order. The results are robust if we use alternative controls for war damage and for ERP aid (Section 7.2).

The variable Reconstruction grants_p measures the value of reconstruction grants assigned to province p during the Marshall Plan. Post 1952_t is a dummy variable equal to 1 for every post-ERP census year. The coefficient of interest δ measures changes in economic activity before and after the program began, and between provinces that received different amounts of reconstruction funds. However, the OLS estimate of δ could be biased because the monetary amount of reconstruction grants assigned to a province can be related to unobservable characteristics in ϵ_{pt}. We therefore instrument the amount of reconstruction grants in province p with the tons of explosives dropped by Allied forces in the same province during the Italian Campaign (IC Bombs_p). This specification exploits variation in the timing and the target of Allied bombings between provinces with similar prewar conditions and total war-related deaths. These differences in tactical bombings during the Italian Campaign are plausibly exogenous, because they stem from the confrontations between the German and Allied armies on Italian soil.

The exclusion restriction states that, after controlling for trends in prewar characteristics (Econ_p) and in total war-related damages in the province (War_p), the instrument IC Bombs_p affects the outcome only through changes in reconstruction grants. While the exclusion restriction is not directly testable, we provide several pieces of evidence in support of our identification strategy. First, as highlighted by prior work on this topic, more bombing may directly lead to more negative postwar outcomes.[25] However, in the Italian context, Allied bombing was sufficiently intense to render the transportation system largely unusable in all

[23] When the dependent variable is an industrial outcome, the unit of observation is an industry i (either food, paper, chemistry, construction, mining, mechanics, manufacturing, textile, or clothing) in province p and census year t. These regressions also include industry-level fixed effects.

[24] Waldinger (2016) points out the importance of war-induced loss of human capital for postwar recovery.

[25] A bombing campaign could also lead to mean reversion in the postwar period. However, in Section 6.1, we show how our results describe an economic expansion beyond the prewar levels, not simply a mean-reversion episode.

Italian provinces that experienced some bombing episodes, generating similar transportation constraints (Section 4.1 and Table 2, columns 2 and 3). Moreover, we find that areas with more bombings received more reconstruction funds during the Marshall Plan and experienced a larger economic expansion. Therefore, if there was a large negative direct effect of tactical bombing on postwar outcomes, it would bias our results toward zero.

Another potential concern is that, even if they were as good as random, bombings may have affected other unobservable factors unrelated with the Marshall Plan but related to post-WWII recovery. However, any effect of tactical bombing that is not mediated by the Marshall Plan would become visible immediately after the first Allied air attacks or in the very first postwar years. By contrast, our analysis shows that any cross-provincial difference starts only after the completion of the first public infrastructure funded through the Marshall Plan, close to ten years after the first Allied air raids. In short, we think that it is implausible for omitted factors to have affected provinces with the exact substantial lag with which the Marshall Plan was implemented.

In addition to instrumental-variable regressions, we estimate reduced-form specifications that directly link the dependent variables to tactical bombings. We compare economic outcomes before and after the Marshall Plan between provinces bombed differentially during the Italian Campaign:

$$\begin{aligned} y_{pt} \;=\; & \alpha_p + \gamma_{rt} + \delta \text{IC Bombs}_p \times \text{Post 1952}_t \\ & + \sum_{z=1}^{3} \text{trend}_t^z \times \text{Econ}_p + \sum_{z=1}^{3} \text{trend}_t^z \times \text{War}_p + \epsilon_{pt}. \end{aligned} \tag{2}$$

The identification assumption of equation (2) requires y_{pt} to follow a similar prewar trend between provinces with different levels of bombing. In testing this assumption, we focus on agricultural outcomes because for these variables we have three consecutive observations before WWII: in 1937, 1938, and 1939. We first regress y_{pt} on IC Bombs$_p$, a linear trend, and the interaction of these last two variables (Table 5, panel A). In all cases, y_{pt} followed the same prewar trend across provinces with different levels of bombing. The same finding holds if we estimate nonlinear prewar trends by replacing the linear trend with two dummy variables for 1938 and 1939 (Table 5, panel B).[26]

[26] Even in the case of tractors—the only variable that is correlated with the intensity of bombing—the interactions between the treatment variable and the two year dummies are small and not statistically significant (Table 5, panel B, column 4).

6 The Effects of Reconstruction Grants on the Italian Recovery

In this section, we show that reconstruction grants received by Italian provinces through the Marshall Plan positively affected local economic development.

6.1 Agricultural Development

Crops. We start by estimating OLS regressions of agricultural outcomes on the reconstruction funds received by each province. We focus on four major Italian agricultural products: wheat and corn, grapes, and wine. A 1-σ difference in the value of reconstruction grants ($29 million) increased wheat and corn production by 19.2 million kilograms, wine production by 16.8 million liters, and grape production by 21.2 million kilograms (Table 6, panel A, columns 1, 2, and 3). Only the first coefficient is statistically different from zero and represents a 16 percent increase from the prewar baseline. We already acknowledged, however, that OLS regressions between economic outcomes and reconstruction funds might be biased due to an endogenous allocation of aid across Italian provinces. We decided to instrument the reconstruction grants with the tactical Allied bombings that followed the Italian surrender, a plausibly exogenous shock to the amount of war damage to the infrastructure.

We first estimate reduced-form regressions. We compare changes in agricultural outcomes before and after the Marshall Plan, between provinces hit by varying amounts of explosives during the Italian Campaign (equation (2)). Provinces that suffered more tactical bombings experienced a disproportionate increase in agricultural production after 1952. A 1-σ difference in tons of explosives (1,681 tons) is associated with 12 million additional kilograms of wheat and corn per province and post-ERP year (Table 6, panel B, column 1). This effect represents a 10 percent increase from the prewar average. Similarly, wine production increased by 10.7 million liters, or 23 percent for each 1-σ increase in tons of explosives, while grape production increased by 13.4 million kilograms, or 19 percent (Table 6, panel B, columns 2 and 3). These results reflect an increase in agricultural production beyond prewar levels, instead of just a faster recovery (Figure A6). Therefore, we can rule out the hypothesis that these findings are simply driven by mean reversion after more intense Allied bombings.

We then return to using the IV regressions to explore the direct link between reconstruction grants and agricultural variables. A 1-σ difference in the amount of reconstruction grant money ($29 million) increased wheat and corn production by 27.3 million kilograms, wine production by 24.4 million liters, and grape production by 30.5 million kilograms.[27] Several tests reject the hypothesis that the tactical bombings are a weak instrument for reconstruc-

[27] The estimated coefficients of all nonlinear trends are in Table A4. The trends correlated with war-related deaths are seldom jointly significant, suggesting that the destruction of human capital is unlikely to be driving these results.

tion grants (Andrews, Stock, and Sun, 2019; Table A5). These findings, which are in line with the reduced-form estimates but larger than the initial OLS estimates, suggest that the OLS estimates are negatively biased. T ECA representatives may have decided to assign a disproportionate amount of funds to poorer, lower-growth provinces, rather than favoring richer, faster-growing locations. Not considering the possibility of an endogenous allocation of aid would lead to underestimating the effect of the Marshall Plan on the Italian economy.

We can link the implementation of the Marshall Plan even more directly to agricultural development by estimating event studies. Yearly difference-in-differences estimates indicate that agricultural production increased only after the start of the Marshall Plan (Figure 2 for IV and A7 for reduced form). The amount of reconstruction funds does not predict differences in the production of wheat and corn during the war or in the postwar years preceding the Marshall Plan. The estimates become positive and statistically significant at the 5 percent level only in 1952, the year following the full distribution of ERP aid (Figure 2, panel A). The production of grapes (Figure 2, panel B) and wine (Figure A8, panel A) followed a similar pattern.

The Agricultural Market and the Adoption of New Technology. The reconstruction grants led to structural changes in the agricultural sector. Specifically, provinces that received more reconstruction funding saw a larger decline in the agricultural workforce. A 1-σ difference in the amount of reconstruction money ($29 million) decreased the number of agricultural workers by 22,309, a 23 percent reduction relative to the prewar workforce (Table 6, panel C, column 4). We do not observe statistically significant changes in the number of agricultural firms, although the estimated coefficient is positive (Table 6, panel C, column 5).

Manual labor was often replaced by agricultural machines in the postwar period. General-purpose tractors, for example, played an increasingly important role in agriculture worldwide during the first half of the twentieth century (Gross, 2018). In 1948, however, their adoption was still strikingly lower in Italy than in other European countries or the United States (Figure A4, panel C). Decades of Fascist autarky had blocked the influx of foreign innovations into Italian agricultural markets (Zamagni, 1997; Fauri, 2006). Not surprisingly, Italian farmers decided to invest in general-purpose tractors when their economic conditions improved.

Provinces that suffered more bombings had more tractors after 1952. A 1-σ difference in the amount of reconstruction funds ($29 million) increased the number of tractors after 1952 by 1,956 per province and year, a 430 percent increase from the prewar baseline (Table 6, panel C, column 6). Yearly difference-in-differences estimates show how the surge in the number of tractors did not happen immediately after the end of the war, but only after the

full disbursement of reconstruction money (Figure A9, panel A).[28] The number of motorized agricultural machines per province and year increased by 3,609 (Table A6, panel B, column 8, and Figure A8, panel E), a 467 percent increase from the prewar baseline.

We observe increased adoption only of tools that were state-of-the-art. Steam-powered threshers, for example, became obsolete during the twentieth century with the progressive introduction of tractor-powered harvester-combines (Pingali, 2007). Not surprisingly, the number of threshers did not increase significantly after WWII in provinces with more reconstruction money (Table 6, panel C, column 7, and Figure A9, panel B).[29]

Summary of Main Findings. The historical literature (Fauri, 2006) and anecdotal evidence (Appendix B) identified the lack of a working transportation system as one of the main obstacles to local economy recovery in Italy. The hypothesis is that an updated and modernized network of roads and railways allowed local farmers to sell their products farer and faster. There are two main pieces of evidence that are consistent with this idea.

First, we find that the effects of reconstruction grants are larger in magnitude for more perishable crops. This result speaks about the importance of a more efficient transportation network because a decrease in transit time to markets would have proven particularly beneficial for agricultural products with a short post-harvest life. A 1-σ difference in reconstruction funds ($29 million) increased the production of asparagus (post-harvest life below two weeks; El-Ramady et al., 2015) by 665 percent, peaches (post-harvest life between two and four weeks) by 700 percent, and pears (post-harvest life between two and four weeks) by 947 percent (Table A7, panel B, columns 1 to 3). The estimated effects of reconstruction grants are substantially smaller for crops with low perishability. A 1-σ difference in reconstruction grant money ($29 million) decreased the production of walnuts (post-harvest life above sixteen weeks) by 19 percent, and increased the production of potatoes (post-harvest life between eight and sixteen weeks) by 22 percent (Table A7, panel B, columns 4 and 5). Both coefficients are not statistically different from zero. Moreover, reconstruction grants are not associated with a significant increase in the production of crops that are concentrated in areas (mainly Southern provinces) with very low exposure to post-armistice bombings, such as oil, olives, and tomatoes (Table A7, panel B, columns 6 to 8).

Second, we can leverage the data on approved projects to estimate event-study regressions in which the event in period 0 is represented by the completion of the first large transportation projects in each province (Appendix C). The results of the event studies indicate that increases in agricultural production in each province began only after the completion of the

[28] Yearly coefficients from reduced-form regressions are shown in Figure A10.

[29] The extent of bombing also predicts no increase in the number of cotton gins (Table A6, column 7, and Figure A8, panel F).

first transportation infrastructure funded through the Marshall Plan.[30]

Third, we can perform a mediation analysis that tests how much of the main treatment effects can be explained by improvements in the transportation network, which are measured by the average post-WWII change in commuting distance between the provincial capital and each municipality within a province. A shorter commuting distance can explain 58 percent of the increase in the production of wheat and corn, 15 percent of the increase in the production of grapes, and 16 percent of the increase in the production of wine (Table A9). These results indicate a large influence of the transportation system on agricultural development if we consider that the post-WWII change in commuting distance to the provincial capital is only an imperfect proxy for the modernization of the road network.

After this initial expansion in agricultural production driven by the modernization of the transportation network, farmers accrued wealth that they at least partially invested in state-of-the-art machinery, such as general-purpose tractors. This investment in capital contributed to decrease the need for labor and further expand agricultural production.[31]

6.2 The Industrial Sector

After the war, workers who chose to leave the agricultural sector readily found employment in industrial firms, since the booming industrial sector of postwar Italy offered more job opportunities and higher salaries (Figure A4, panel D). And this industrial expansion was greater after 1952 in those provinces that had received more ERP reconstruction money. A 1-σ difference in the amounts of reconstruction funds ($29 million) increased the number of industrial firms by 203 units per province and sector—29 percent more than the prewar baseline (Table 7, panel C, column 1). This change was largely driven by small establishments with at most ten employees, since the number of larger firms did not correlate with reconstruction grants (Table 7, panel C, column 2 and 3).[32]

More firms created more jobs. A 1-σ difference in reconstruction funding ($29 million) increased the post-ERP number of industrial employees by 2,423, or 62 percent per industry, province, and census year (Table 7, panel C, column 4). This increase is more pronounced among white-collar and managerial positions relative to blue-collar jobs (Table 7, panel C,

[30] Additional suggestive evidence indicates that more modern infrastructure affected economic activity. In OLS specifications, we split our measure of reconstruction funding into two variables: grants for new projects and grants for restoration of old infrastructure. Only the first variable increased agricultural production after 1952 (Table A8). We cannot, however, obtain IV estimates with these specifications because we don't have two separate instrumental variables.

[31] Consistent with this hypothesis, we find that agricultural production increased more in provinces with an above-median increase in the number of tractors after the Marshall Plan (Table A10).

[32] Despite a disproportionate expansion of the industrial sector, we do not observe large and precisely estimated increases in population, average salaries, or education (Table A6, panel A, columns 1 to 4).

columns 5 and 6). Similarly, a 1-σ difference in reconstruction grant money ($29 million) increased the number of workers in the service sector by 5,898, or 36 percent per province and census year (Table 7, panel C, column 7).[33]

Difference-in-differences estimates for each census year provide more insights into the timing of the effects (Figure A9, panels C-F). In 1951, three years into the implementation of the Marshall Plan, provinces experiencing different bombing levels during the Italian Campaign had similar levels of industrial outcomes. In 1961, nine years after the full distribution of grants through the ERP, provinces that had suffered more bombings had significantly more industrial firms and workers. The effect peaked in 1971, then decreased between 1981 and 2001, suggesting that the initial divergence between provinces was only temporary.

6.3 Other Outcomes

Patents. We use newly digitized patent data to analyze the creation of intellectual property. Individuals and firms in provinces with more reconstruction funds invested more in the development of newer technologies, but this effect was short-lived. The number of patents issued in provinces with more bombings decreased significantly during the conflict (Figure A11, panel A for reduced-form and panel B for IV); local patent offices were less likely to operate in areas that were subject to more air attacks. Immediately after WWII, however, the number of patents issued to domestic inventors bounced back, probably due to a backlog of patent applications. After this initial effect subsided, the number of patents issued in provinces with more reconstruction money started rising again after 1952. A 1-σ difference in the amount of reconstruction funds ($29 million) increased the number of patents issued per province, year, and technological field by 28 percent (2.2 patents) in 1953, 45 percent (3.5 patents) in 1954, 48 percent (3.7 patents) in 1955, and 37 percent (2.9 patents) in 1956 (Figure A11, panel B). By 1957, however, we observe no significant difference in the number of new patents between provinces with varying amounts of reconstruction grant money.

Political Outcomes. According to previous research on the Marshall Plan (for example, De Long and Eichengreen, 1993), the main consequence of the program was to help European countries develop pro-market institutions, while the overall effect of the spending stimulus to the European economies was relatively small. As explained in the introduction, the goal of this paper is to complement these cross-country findings by exploring within-country variation. Although estimating national-level effects of the Marshall Plan on Italian institutions is beyond the scope of this paper, we can nevertheless investigate whether the reconstruction

[33] Due to the large number of dependent variables employed in this section, we adjust the p-values of the main treatment effects for multiple-hypothesis testing. The treatment effects that are significant at the 5 percent level or lower tend to remain significant at the 10 percent level or lower after this adjustment (Table A11).

grants were correlated with differences in political outcomes at the province level. Specifically, we test whether the reconstruction grants can predict differences in the number of labor strikes and in voting behavior. Our finding is that the Marshall Plan aid did not have any significant relationship with the intensity of strikes or the share of votes for the Communist Party, but was positively correlated with the share of votes for the pro-US Christian Democratic Party (Table A12).[34] This last finding is consistent with the preexisting evidence on the nationwide effects of the Marshall Plan.

7 Robustness Checks

7.1 Controls for Geography

Geography is one of the main sources of plausible confounding effects. One concern is that German troops may have chosen to stay in more favorable locations while occupying Italy after September 1943. For example, they might have settled in provinces that had better transportation connections with the Third Reich to make a future retreat easier or to facilitate the transportation of war supplies to the warfront. In such a case, these provinces might have economically flourished after the end of WWII due to their better connections to Austria and Germany, rather than due to Marshall Plan funding. In this section, we show that our main results are robust to several checks that control for the geographical location of each province.

First, we drop from the estimating sample all provinces that are within 500 km of the Brenner Pass, the main gateway toward Austria (Figure A12). The remaining provinces are so far away from the Austrian border that they cannot reasonably have any advantage in trading with Germany. Our results are not affected by this restriction in the sample (Table A13, panel A). Alternatively, we include a dummy that identifies provinces through which the Brenner Highway, the most direct road to that border, passes, interacted with trends up to the third order.[35] The main findings are not affected by this robustness check (Table A13, panel B). More generally, the results are robust if we control for nonlinear trends correlated with any highway leading abroad, not just with the Brenner Highway (Table A13, panel C), or with the cumulative length of all main roads in 1938 (Table A13, panel D).

Second, we show that controlling for nonlinear trends that are correlated with geographic

[34] The increase of votes for the Christian Democratic Party happened at the expense of small parties, whose number decreased during this period.

[35] Established in 1968, the Brenner Highway (Autostrada A22) was created over already existing routes connecting the Brenner Pass to Emilia-Romagna, a region well connected with other locations in northern-central Italy. Emilia-Romagna hosted a large portion of the Gothic line for most of the Italian Campaign. From Emilia-Romagna, the German troops deployed on the warfront would have followed the same path of the modern Brenner Highway to reach Germany.

characteristics does not affect the results. We augment the baseline specification (2) by including the interaction between a trend up to the third order and the two province-level variables of average elevation and share of rural municipalities. The treatment effects are robust to the inclusion of these additional controls (Table A14, panel A). These variables allow us to compare two provinces in the same macro-area with a similar share of land that could be used for agriculture. They cannot control, however, for the quality of the soil. To do this, we use data on the fertility of the land collected by the Food and Agriculture Organization (FAO) of the United Nations through its "Global Agro-Ecological Zones" initiative.[36] Specifically, we control for fertility of the soil for the production of wheat, maize, tomatoes, and potatoes in 1961 (the first year available), interacted with a time trend up to the third order. The inclusion of these variables does not modify the main findings (Table A14, panel B). Moreover, we directly include latitude, longitude, their squares, and distance from the Brenner pass, all interacted with trends up to the third order. The inclusion of this large number of nonlinear geographical trends does not change our main findings (Table A14, panel C).

In short, there is no evidence that the geographical location of the provinces, especially in relation to their distance from the Italian border with Austria, interacted with the main treatment effects. In the last part of this section, we address two different concerns related to geography. First, we can show that the results are quantitatively similar to the baseline estimates if we include all Italian provinces, rather than excluding provinces located in Sicilia and Sardegna (Table A15, panel A). Similarly, we can drop all provinces in southern Italy, because these areas were subject to fewer (if any) tactical bombings during the Italian Campaign (Table A15, panel B).[37] Second, the results are robust to estimating spatial HAC standard errors (Conley, 1999) that control for spatial correlation between geographical areas (Table A16).

7.2 War-related Damage, Other ERP Aid, and Government Spending

In this section, we test whether war-related events, other forms of ERP aid, or contemporaneous investments made by the Italian government may explain part of the treatment effects.

[36] Fertility is measured as kilograms produced over hectares. The data is available online at http://www.fao.org/nr/gaez/about-data-portal/agricultural-suitability-and-potential-yields/en/.

[37] Even if southern areas are not needed to obtain the main findings, we find that the reconstruction funding is associated with increases in agricultural production and decreases in the number of agricultural workers in the vast majority of Italian regions, including the southern ones (Figure A13). However, the expansion of the industrial sector tends to be more concentrated in the north. In this sense, the Marshall Plan might have reinforced the differences between northern and southern Italy.

First, we test the role played by the war. The main regressions include the share of war-related deaths in each province interacted with trends up to the third order. These variables control for changes in industrial and agricultural output that might stem from WWII, but that are not directly related to the destruction and subsequent reconstruction of public infrastructure. We replace the share of war-related deaths in each province with the bomb tonnage dropped by Allied forces *before* the armistice interacted with trends up to the third order. In this case, all estimates are quantitatively unchanged (Table A17, panel A).

Second, we test the role played by the other types of ERP funds, such as in-kind aid and loans. For example, a possible concern is that the agricultural development was driven by the distribution of tractors as a form of in-kind aid, rather than by the allocation of reconstruction grants. However, Section 6.1 included several results that directly linked the completion of transportation infrastructure with an increase in agricultural production. Moreover, the adoption of agricultural machines by itself cannot fully explain the increase in agricultural production. In fact, quantity increased also for crops that predominantly relied on manual labor, such as asparagus.[38]

To further assuage this concern, robustness checks include the difference between the total amount of ERP aid received by each province and the amount of grant money specifically assigned to the reconstruction of public infrastructure. We then interact it with Post 1952_t, which is equal to 1 for every post-ERP census year. This variable captures any change in industrial and agricultural outcomes after 1952 that might be correlated with any ERP intervention not directed to the reconstruction of infrastructure. Even after controlling for these factors, the results do not change significantly (Table A17, panel B).[39] In addition, the results are robust if we control simultaneously for war-related deaths and other ERP interventions (total grants not for reconstruction) (Table A17, panel C).

Finally, we control for the concurrent spending by the Italian government by including public investments in the transportation network from 1946 to 1952 and from 1953 to 1970, both interacted with trends up to the third order.[40] While the effects on industrial firms are diminished, all the other estimated coefficients are statistically significant and close to the baseline (Table A17, panel D). The same findings hold if we control for the total spending on infrastructure by the Italian government (Table A17, panel E).

[38] https://www.huffingtonpost.com/2015/04/10/asparagus-farms-california_n_7029836.html.

[39] Sobel-Goodman mediation tests confirm these findings. ERP grants that were not destined for the reconstruction of infrastructure can mediate at most 17.5 percent of the total effect of IC bombs (Table A18). For most outcomes, this proportion is much smaller.

[40] Picci (2002) provides a description of these data.

7.3 Alternative Specifications of Bombings

In this subsection, we show that the choices we made in constructing the treatment variable do not affect the results. First, we show that the data support the existence of a linear relationship between the tonnage of Allied bombs dropped on a province and the amount of ERP reconstruction money received (Figure A14, panel A).[41] In the scatterplot, we notice that several provinces did not receive any Allied bombings, while some provinces were hit by a disproportionate tonnage of explosives. When we repeat the analysis, dropping these observations from the sample, we find that the main findings are robust (Table A19, panel A and B). Even in the few cases in which a treatment effect loses significance, the estimated coefficient remains close to the baseline.

Second, we show that alternative specifications of bombings are worse predictors for war damage and the amount of reconstruction funding (Table A20). Specifically, a 1-σ difference in the tons of Allied bombs dropped predicts a 22 percent increase in reconstruction money and a 21 percent increase in damage. Dividing the tonnage of Allied bombs by either the area of the province or by the number of residents in 1937 shows correlations with these two variables that are at least 5 percentage points smaller.

Third, we compute the tonnage of Allied bombs dropped from September 8, 1943—the day the Armistice of Cassibile was publicly announced—instead of from March 1944 (Table A19, panel C).[42] Including all the air attacks since September 1943 does not change the main findings.

Fourth, we can extend the number of targets included in the treatment variable without affecting the main findings (Table A19, panel D). The original list isolates air attacks against targets that are closely related to land battles against German troops. To those, we can add the air strikes against bridges, tunnels, airports, and waterways.

8 Conclusions

In this paper, we have examined the effect of the Marshall Plan on the Italian postwar economy. The modernization of transportation systems was associated with (i) an increase in agricultural production despite a decrease in the number of agricultural workers, (ii) more widespread adoption of modern agricultural machines, and (iii) an expansion of the industrial and service sectors. These findings indicate that, in addition to influencing Italian institutions, the Marshall Plan had beneficial effects on local economic development. Within

[41] Regressing the reconstruction grants on the Allied bombing leads to a residual plot in which the residuals are symmetrically placed around the zero line (Figure A14, panel B).

[42] In the main results, we selected March 1944 as the starting date of tactical bombing, because in this month official documents formally ranked the warfront against German troops in Italy as the top priority for the Allied Tactical Air Forces.

each Italian macro-region, the amount of ERP reconstruction grant money had a profound impact on the economic growth of otherwise similar nearby provinces.

Are these findings informative for the debate on the returns on new infrastructure in European and North American economies? On the one hand, we must acknowledge that our estimates might represent an upper bound of the effects that we would observe if we could redesign the current public infrastructure in Italy, other European countries, or the United States. This is because for ideological reasons, prewar fascist Italy deliberately gave a low priority to national and international trade, and so declined to invest in maintaining high-quality infrastructure in the prewar years. This makes the case of Italy different from that of modern high-income economies—like those in much of Europe or the US. On the other hand, the Marshall Plan is one of the most recent examples of large-scale modernization of public infrastructure in high-income European countries. In this sense, this setting shows how a developed economy with plenty of highly skilled human capital and functioning institutions benefits from a more efficient infrastructure stock.

References

Acharya, Avidit, Matthew Blackwell, and Maya Sen. 2016. "Explaining causal findings without bias: Detecting and assessing direct effects." *American Political Science Review*, 110(3): 512–529.

Akbulut-Yuksel, Mevlude. 2014. "Children of War: The Long-Run Effects of Large-Scale Physical Destruction and Warfare on Children." *Journal of Human Resources*, 49(3): 634–662.

Anderson, T W and Herman Rubin. 1949. "Estimation of the Parameters of a Single Equation in a Complete System of Stochastic Equations." *The Annals of Mathematical Statistics*, 20(1): 46–63.

Andrews, Isaiah, James H. Stock, and Liyang Sun. 2019. "Weak Instruments in Instrumental Variables Regression: Theory and Practice." *Annual Review of Economics*, 11: 727–753.

Arkes, Hadley. 1972. *Bureaucracy, the Marshall Plan, and the National Interest.* Princeton University Press.

Baldoli, Claudia and Andrew Knapp. 2012. *Forgotten Blitzes: France and Italy under Allied Air Attack, 1940-1945.* London:Continuum International Publishing Group.

Banerjee, Abhijit, Esther Duflo, and Nancy Qian. 2012. "On the Road: Access to Transportation Infrastructure and Economic Growth in China." NBER Working Paper 17897.

Boel, Bent. 2003. *The European Productivity Agency and Transatlantic Relations, 1953-1961.* Copenhagen, Denmark:Museum Tusculanum Press - University of Copenhagen.

Casella, Alessandra and Barry Eichengreen. 1996. "Can Foreign Aid Accelerate Stabilisation." *Economic Journal*, 106(436): 605–619.

Conley, T. G. 1999. "GMM estimation with cross sectional dependence." *Journal of Econo-*

metrics, 92(1): 1–45.

Davis, Donald R. and David E. Weinstein. 2002. "Bones, bombs and break points: the geography of economic activity." *American Economic Review*, 92(5): 1269–1289.

Dell, Melissa and Pablo Querubin. 2017. "Nation Building Through Foreign Intervention: Evidence from Discontinuities in Military Strategies." *The Quarterly Journal of Economics*, forthcoming.

De Long, J. Bradford and Barry Eichengreen. 1993. "The Marshall Plan: History's Most Successful Structural Adjustment Program." In *Postwar Economic Reconstruction and its Lessons for East Today.* , ed. Rudiger Dornbusch, Wilhelm Nolling, and Richard Layard. Cambridge, MA:MIT Press.

Donaldson, Dave. 2018. "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure." *American Economic Review*, 108(4-5): 899–934.

Donaldson, Dave and Richard Hornbeck. 2016. "Railroads and American Economic Growth: A "Market Access" Approach." *Quarterly Journal of Economics*, 131(2): 799–858.

ECA. 1951. *Italy: Country Study, European Recovery Program.* United States Government Printing Office.

Eichengreen, Barry, Marc Uzan, Nicholas Crafts, and Martin Hellwig. 1992. "The Marshall Plan: Economic Effects and Implications for Eastern Europe and the Former USSR." *Economic Policy*, 7(14): 13–75.

El-Ramady, Hassan R., Éva Domokos-Szabolcsy, Neama A. Abdalla, Hussein S. Taha, and Miklós Fári. 2015. "Postharvest Management of Fruits and Vegetable Storage." In *Sustainable Agriculture Reviews.* Vol. 15, , ed. Eric Lichtfouse, 65–152. Springer International Publishing Switzerland.

European Investment Bank. 2017. "Municipality Infrastructure Survey."

Faber, Benjamin. 2014. "Trade integration, market size, and industrialization: Evidence from China's national trunk highway system." *Review of Economic Studies*, 81(3): 1046–1070.

Fauri, Francesca. 2006. *Il Piano Marshall e l'Italia.* Bologna:Il Mulino.

Fontana, Nicola, Tommaso Nannicini, and Guido Tabellini. 2017. "Historical Roots of Political Extremism: The Effects of Nazi Occupation of Italy." IZA DP 10551.

Giorcelli, Michela. 2019. "The Long-Term Effects of Management and Technology Transfers." *American Economic Review*, 109(1): 1–33.

Grindrod, Muriel. 1955. *The Rebuilding of Italy: Politics and Economics, 1945-1955.* Royal Institute of International Affairs.

Gross, Daniel P. 2018. "Scale versus Scope in the Diffusion of New Technology." *The RAND Journal of Economics*, 49(2): 427–452.

Harper, John Lamberton. 2002. *America and the Reconstruction of Italy, 1945-1948.* Cambridge University Press.

Hogan, Michael J. 1987. *The Marshall Plan. America, Britain and the Reconstruction of Western Europe, 1947–1952.* Cambridge:Cambridge University Press.

Hornbeck, Richard and Daniel Keniston. 2017. "Creative destruction: Barriers to urban growth and the Great Boston Fire of 1872." *American Economic Review*, 107(6): 1365–1398.

Jones, Joseph M. 1955. *The Fifteen Weeks (February 21-June 5, 1947).* New York:The Viking Press.

Knapp, Manfred, Wolfgang F. Stolper, and Michael Hudson. 1981. "Reconstruction and West-Integration: The Impact of the Marshall Plan on Germany." *Journal of Institutional and Theoretical Economics*, , (September): 415–433.

Lombardo, Giorgio. 2000. *L'Istituto Mobiliare Italiano: Centralità per la Ricostruzione, 1945-1954.* Bologna:Il Mulino.

Lt Col Robertson, J. A., R. Burr, and B. Barth. 2013. "USAF THOR Database." Available at www.afri.au.af.mil/thor.

Mayne, Richard. 1970. *The Recovery of Europe: From Devastation to Unity.* Harper & Row.

Miguel, Edward and Gérard Roland. 2011. "The long-run impact of bombing Vietnam." *Journal of Development Economics*, 96(1): 1–15.

Milward, Alan S. 1984. *The Reconstruction of Western Europe 1945-51.* London:Methuen.

Morten, Melanie and Jaqueline Oliveira. 2017. "The Effects of Roads on Trade and Migration: Evidence from a Planned Capital City." NBER Working Paper 22158.

Olea, José Luis Montiel and Carolin Pflueger. 2013. "A Robust Test for Weak Instruments." *Journal of Business and Economic Statistics*, 31(3): 358–369.

Picci, Lucio. 2002. "Le infrastrutture in Italia. Le differenze territoriali e l'efficienza della spesa." In *L'Italia nella competizione globale - Regole per il mercato.* , ed. Mario Baldassarri, Giampaolo Galli, and Gustavo Piga. Milano:Edizioni il Sole 24 Ore.

Pingali, Prabhu. 2007. "Agricultural Mechanization: Adoption Patterns and Economic Impact." In *Handbook of Agricultural Economics.* Vol. 3, Chapter 54, 2779–2805.

Qian, Nancy. 2014. "Making Progress on Foreign Aid." *Annual Review of Economics*, 3(April): 277–308.

Riaño, Juan Felipe and Felipe Valencia Caicedo. 2020. "Collateral damage: The Legacy of the Secret War in Laos." working paper, Vancouver School of Economics.

Romp, Ward and Jakob De Haan. 2007. "Public capital and economic growth: A critical survey." *Perspektiven der Wirtschaftspolitik*, 8(S1): 6–52.

Steil, Benn. 2018. *The Marshall Plan: Dawn of the Cold War.* Simon & Schuster.

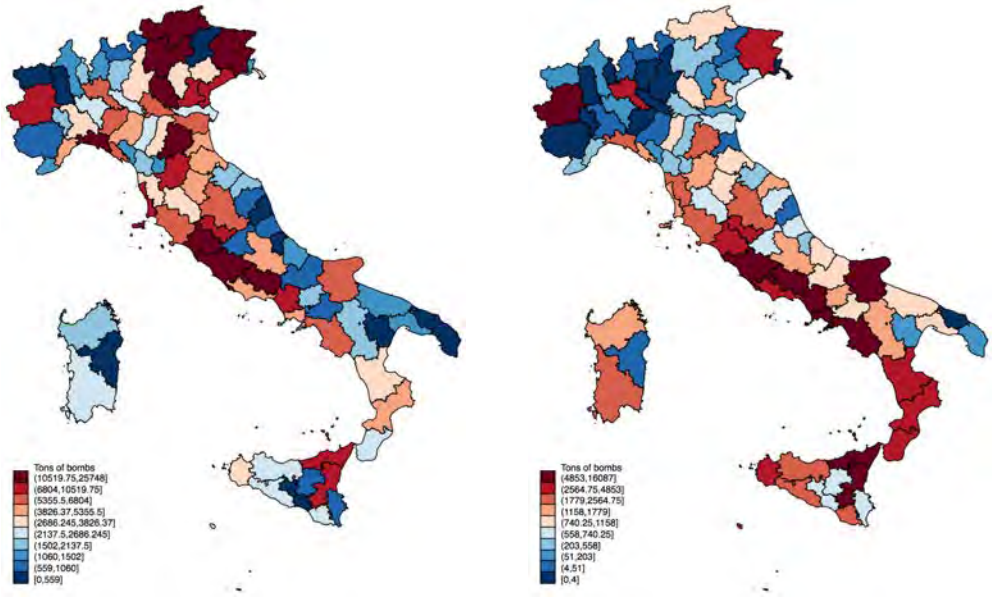
TRIP. 2018. "Key Facts About America's Surface Transportation System and Federal Funding."

Waldinger, Fabian. 2016. "Bombs, Brains, and Science: The Role of Human and Physical Capital for the Creation of Scientific Knowledge." *Review of Economics and Statistics*, 98(5): 811–831.

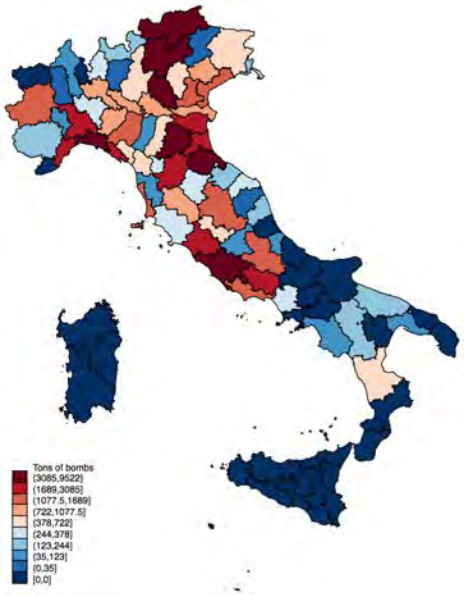
Zamagni, Vera. 1997. *Come Perdere la Guerra e Vincere la Pace. L'Economia Italiana tra Guerra e Dopoguerra: 1938-1947.* Bologna:Il Mulino.

Figures and Tables

Figure 1: Maps of Allied Bombing



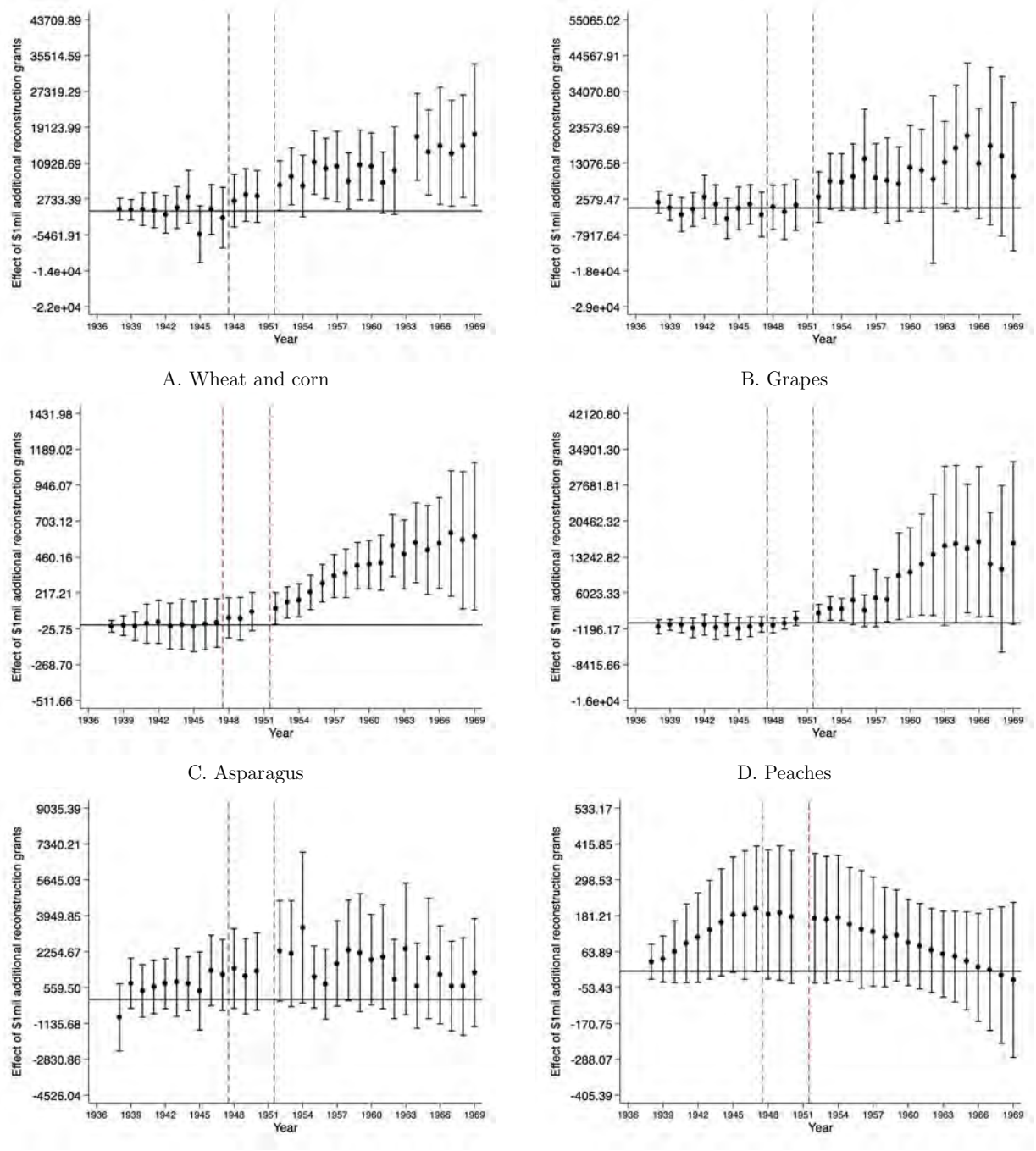
A. All bombs B. Before armistice



C. Italian Campaign

Notes: These figures show the distribution of Allied bombings across Italian provinces. Panel A shows all bombings. Panel B shows the distribution of bombings before the Armistice of Cassibile, on September 3, 1943. Panel C shows only the Allied bombings associated with the Italian Campaign: these air strikes happened after March 1944 and focused on targets related to land battles against the German forces.
Sources: USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Figure 2: Effects of Reconstruction Grants on Agricultural Production



Notes: These graphs show the effect of an additional $1 million in reconstruction grants on different crops. The amount of reconstruction grants received by a province is instrumented with the amount of explosives dropped during the Italian Campaign. The regressions also include province fixed effects and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, employment rate, horsepower, share of industrial workers, share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the production of wheat and corn in each province, and year (100kg, panel A), grapes (100kg, panel B), asparagus (100kg, panel C), peaches (100kg, panel D), olives (100kg, panel E), and walnuts (100kg, panel F). Source: Censimento dell'Industria e dei Servizi, Istituto Nazionale di Statistica. USAF THOR Database, available at www.afri.au.af.mil/thor.

Table 1: Summary Statistics

Panel A: Census Data

	Before WWII	After WWII
	(1)	(2)
Number of industrial firms	704	863
Number of industrial workers	3,969	5,883
Industrial firms $\leq$ 10 employees	667	747
Industrial firms $>$ 10 employees	36	42
Number of agricultural workers	96,447	45,206
Wheat and corn production (100kg)	1,234,237	1,323,251
Wine production (100L)	459,347	582,161
Grape production (100kg)	694,159	857,406
Oil production (100kg)	27,196	34,835
Olive production (100kg)	167,829	187,694
Tractors	454	3,420
Threshers	383	323
Patents	62	76
Population	461,828	588,300

Panel B: Bombings

	All bombs	Italian Campaign
	(1)	(2)
Number of attacks	5,771	1,332
All attacks (tons of explosives)	402,045	82,520
Support to ground operations (tons)	57,722	44,308
Transport infrastructures (tons)	74,332	38,212

Notes: Panel A shows summary statistics on Italian industry and agriculture. Column 1 shows averages per province and industry before WWII (1927 and 1937 for industrial census; 1937, 1938, 1939 for agricultural annals), while column 2 shows averages after WWII (every 10 years from 1951 to 2001 for industrial census; every year from 1946 to 1969 for agricultural annals). Panel B shows summary statistics of Allied bombings (all bombings in column 1 and the Italian Campaign bombings in column 2). The air strikes associated with the Italian Campaign happened after March 1944 and focused on targets related to land battles against the German forces.
Sources: Censimento dell'Industria e dei Servizi, Annuario di Statistica Agraria, Censimento Generale della Popolazione, Istituto Nazionale di Statistica (panel A). USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor (panel B).

Table 2: Bombings, Destruction, and ERP Aid

	Damages	Unusable roads	Unusable railways	Reconstruction grants	Food & drugs	Loans	All grants
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Italian Campaign bombs, No controls							
Tons of IC bombs	5,232.004***	-0.0001	-0.0005***	10,108.637***	-6,917.717	323.085**	-3,667.318
	(909.744)	(0.0004)	(0.0001)	(1,740.011)	(4,266.533)	(154.548)	(9,866.659)
Observations	79	79	79	79	78	79	78
R^2	0.400	0.001	0.057	0.341	0.018	0.031	0.001
Panel B: Italian Campaign bombs, Province controls							
Tons of IC bombs	4,555.520***	-0.0001	-0.0006**	6,776.236***	-11,589.643**	37.339	-16,078.844
	(671.283)	(0.0005)	(0.0003)	(1,327.345)	(5,051.757)	(94.113)	(10,196.982)
Observations	75	75	75	75	74	75	74
R^2	0.720	0.306	0.253	0.736	0.698	0.864	0.722
Mean outcome	42,127,685	73	44	78,745,789	41,623,094	1,910,392	162,751,795
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681	1,681

Notes: Data on funding from the Marshall Plan come from *"Missione Americana ERP in Italia", "Mutual Security Agency"* bulletins, and the historical archive of the *Istituto Mobiliare Italiano.* Data on damages to public infrastructure (transportation system, sanitation system, and public buildings) come from *"Italy: Country Study"* by the ECA. The variable "Unusable roads" (railways) measures the share of roads (railways) that was deemed not usable by US authorities in 1947. Province controls in Panel B include region fixed effects, population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers (all observed before WWII). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Characteristics of Funded Projects

	All Provinces (1)	Quintile 1 (2)	Quintile 2 (3)	Quintile 3 (4)	Quintile 4 (5)	Quintile 5 (6)
Share of grants used for transportation network						
1948-1952	0.52	0.52	0.52	0.53	0.53	0.53
Share of grants used for hygiene infrastructure						
1948-1952	0.15	0.16	0.12	0.16	0.16	0.16
Share of grants used for public buildings						
1948-1952	0.32	0.31	0.36	0.31	0.32	0.32
Number of projects						
1948-1952	77.04	69.19	47.70	81.84	63.89	108.39
1948	5.72	6.12	4.10	6.11	4.39	7.17
1949	21.79	20.06	13.40	24.16	18.56	28.72
1950	23.04	20.25	14.60	23.47	19.33	33.44
1951	18.58	17.06	11.40	19.32	15.50	26.22
1952	7.91	5.69	4.20	8.79	6.11	12.83
Number of transportation projects						
1948-1952	37.80	9.56	9.60	37.37	40.22	76.61
1948	3.78	1.12	1.20	3.68	3.44	8.00
1949	9.65	2.69	2.50	9.21	11.22	18.72
1950	11.80	2.31	2.60	12.42	11.83	24.67
1951	7.88	2.38	2.20	6.89	9.28	15.56
1952	4.69	1.06	1.10	5.16	4.44	9.67
Cost per project (2010 USD)						
1948-1952	1,773,641	2,152,764	3,250,024	1,403,558	1,455,489	1,325,225
1948	1,931,482	2,437,761	1,977,405	1,491,806	2,039,555	1,811,973
1949	1,212,103	1,636,102	1,974,165	853,719	968,976	1,033,270
1950	1,872,237	2,316,338	3,549,321	1,508,780	1,502,903	1,298,750
1951	2,822,649	3,296,138	5,269,323	2,124,647	2,425,477	2,176,457
1952	1,065,244	1,468,733	2,176,459	873,366	804,586	552,443
Share of grants used for new infrastructure						
1948-1952	0.48	0.02	0.17	0.50	0.74	0.80
1948	0.43	0.00	0.00	0.32	0.74	0.87
1949	0.41	0.00	0.00	0.35	0.66	0.81
1950	0.52	0.00	0.21	0.53	0.81	0.84
1951	0.47	0.00	0.19	0.53	0.72	0.73
1952	0.61	0.24	0.42	0.74	0.69	0.83
Share of grants used for new transportation infrastructure						
1948-1952	0.47	0.02	0.17	0.48	0.72	0.77
1948	0.42	0.00	0.00	0.31	0.71	0.84
1949	0.39	0.00	0.00	0.34	0.64	0.78
1950	0.50	0.00	0.21	0.51	0.78	0.82
1951	0.46	0.00	0.18	0.52	0.70	0.71
1952	0.59	0.24	0.42	0.71	0.67	0.80
Observations	81	16	10	19	18	18

Notes: This table shows statistics on the projects funded through ERP reconstruction aid in all provinces not in the regions of Sardegna or Sicilia (column 1), provinces in the first quintile of the distribution of explosives dropped during the Italian Campaign (column 2), in the second quintile (column 3), third quintile (column 4), fourth quintile (column 5), and fifth quintile (column 6). The variables named "Share of grants" divide the amount of grants used for a specific purpose by the total amount of grants received between 1948 and 1952 or in a given year. Costs are expressed in 2010 USD. "New infrastructure" identifies public works that did not reconstruct public infrastructure that was present before WWII. Sources: *"Missione Americana ERP in Italia",* "Mutual Security Agency" bulletins, and the historical archive of the *Istituto Mobiliare Italiano.*

Table 4: Correlation between Prewar Characteristics, War Events, and Bombing

	Pre-armistice bombs (1)	IC bombs (2)	Standard deviation (3)		Pre-armistice bombs (1)	IC bombs (2)	Standard deviation (3)
			Industrial census: 1927, 1937				
Industrial firms	0.476**	0.207	1,255	Blue collar workers	0.040*	0.015	8,574
	(0.214)	(0.134)			(0.020)	(0.013)	
Industrial workers	0.037**	0.014	9,856	Management and white collar	0.399*	0.171	1,481
	(0.018)	(0.012)			(0.209)	(0.142)	
Industrial firms $\leq$ 10 employees	0.481**	0.210	1,216	Horsepower	0.019***	0.006	16,663
	(0.216)	(0.134)			(0.006)	(0.005)	
Industrial firms $>$ 10 employees	4.356*	1.889	89	Horsepower from electrical eng.	0.022***	0.006	14,628
	(2.301)	(1.621)			(0.008)	(0.005)	
			Agricultural statistics: 1938–1939 (Agricultural firms: 1929)				
Agricultural area (ha^2)	0.006***	0.001	148,878	Wine production (100L)	0.002	0.001	342,153
	(0.002)	(0.001)			(0.001)	(0.001)	
Agricultural firms	0.032***	-0.003	24,259	Grape production (100kg)	0.001	0.001	507,567
	(0.011)	(0.006)			(0.001)	(0.000)	
Wheat and corn production (100kg)	0.016***	0.000	844,060	Tractors	0.246	1.242**	484
	(0.005)	(0.000)			(0.612)	(0.540)	
			Population census: 1931, 1936				
Agricultural workers	0.019***	0.006	43,959	Service workers	0.050*	0.024	20,412
	(0.007)	(0.005)			(0.026)	(0.017)	
Population density	3.244*	1.504	113	Population	0.003**	0.001	341,561
	(1.632)	(1.505)			(0.001)	(0.001)	
Size (km^2)	0.522**	0.163	1,691				
	(0.227)	(0.125)					
			Patents: 1938, 1939				
All patents	12.711	6.177	40	Agricultural patents	20.124	10.069	35
	(8.322)	(5.396)	41		(14.512)	(9.810)	
Industrial patents	11.959	5.781					
	(7.808)	(5.005)					
			Electoral statistics: 1934				
Voter turnout	6.174	73.859	2.027				
	(110.61)	(94.596)					
			Geographical statistics: 2018				
Elevation (m)	0.395	-0.646	204	Share coastal	1,772.631	-874.563	0.15
	(0.908)	(0.828)			(1,262.309)	(907.294)	
Share mountains	-972.341*	192.266	0.29	Share rural	-109.617	60.148	0.23
	(501.866)	(529.016)			(958.589)	(497.025)	
			Infrastructure: railroads in 1931 and roads in 1938				
Length railways (km)	9.678**	3.506	123	Length roads (km)	2.567**	0.760	316
	(4.116)	(2.213)			(1.161)	(0.618)	
			War events				
Above Gustav Line	-1,399.610**	1,177.870***		Above Gothic Line	-2,059.389***	715.747*	
	(652.784)	(228.239)			(558.781)	(363.529)	
Tons of bombs - mean	1,533	1,045			1,533	1,045	
Tons of bombs - std. dev.	2,419	1,681			2,419	1,681	

Notes: Each row-column combination shows the coefficient β_1 from a different regression of the tonnage of bombs in a province on a prewar variable: $\text{Tons}_p = \beta_0 + \beta_1 \cdot \text{Pre-war characteristic}_{pt} + \varepsilon_{pt}$, where $t < 1940$. Column 1 uses the tons of explosive dropped by Allied forces before the armistice of September 8, 1943 as dependent variable. Column 2 uses the tons of explosives launched during the Italian campaign as dependent variable. When the independent variable comes from the Industrial census, the regression also includes industry fixed effects. *** p<0.01, ** p<0.05, * p<0.1. Sources: Censimento dell'Industria e dei Servizi, Annuario di Statistica Agraria, Censimento Generale della Popolazione, Statististica delle Elezioni Generali Politiche per la XXIX Legislatura, USAF Theater History of Operations Reports (THOR) Database.

Table 5: Prewar Trends in Agricultural Output

	Wheat and corn production	Wine production	Grape production	Tractors	Other machines	Wheat and corn area
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Linear trend			
Tons of IC bombs	59.501	26.673	43.631	0.091***	0.009	0.801
	(53.598)	(24.039)	(37.468)	(0.022)	(0.015)	(2.238)
Linear trend	-57,734.244***	31,831.162***	41,687.428***	8.973	43.342***	428.589
	(16,307.483)	(8,965.873)	(12,537.358)	(6.489)	(11.016)	(315.455)
Tons of IC bombs x Linear trend	4.942	2.203	3.307	0.006	0.000	-0.022
	(5.409)	(4.141)	(4.956)	(0.007)	(0.003)	(0.162)
Observations	235	235	235	235	235	235
R^2	0.022	0.030	0.033	0.129	0.009	0.001
			Panel B: Year dummies			
Tons of IC bombs	62.632	28.677	45.676	0.099***	0.009	0.812
	(49.578)	(25.216)	(39.396)	(0.021)	(0.016)	(2.263)
Year 1938	-85,301.160**	45,604.113**	37,813.019	14.862	31.377***	-836.149**
	(38,694.574)	(21,702.114)	(29,380.180)	(9.633)	(9.508)	(361.584)
Year 1939	-115,532.845***	63,712.104***	83,381.896***	17.934	86.646***	852.373
	(32,764.730)	(18,010.045)	(25,188.877)	(13.035)	(22.123)	(632.460)
Tons of IC bombs x Year 1938	10.375	2.800	7.093	-0.000	0.000	-0.121
	(10.241)	(7.235)	(9.340)	(0.007)	(0.004)	(0.141)
Tons of IC bombs x Year 1939	9.869	4.418	6.616	0.012	-0.000	-0.045
	(10.861)	(8.316)	(9.952)	(0.013)	(0.007)	(0.325)
Observations	235	235	235	235	235	235
R^2	0.037	0.031	0.033	0.129	0.009	0.001
Mean outcome	1,234,237	459,348	694,159	454	319	69,992
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681

Notes: Panel A estimates linear trends in agricultural outputs before WWII. Panel B estimates nonlinear trends by including dummy variables for 1938 and 1939. Tons of IC bombs measures the tons of explosives dropped by Allied air forces against targets related to the Italian Campaign against German troops. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the number of tractors (column 4), the number of other agricultural machines (column 5), the hectares used for wheat and corn production (column 6). Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Sources: Censimento dell'Industria e dei Servizi, Annuario di Statistica Agraria, Censimento Generale della Popolazione, Istituto Nazionale di Statistica. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Table 6: Effects on Agricultural Outcomes

	Wheat & corn production	Wine production	Grape production	Agricultural workers	Agricultural firms	Tractors	Threshers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: OLS							
Reconstr. grants (M) x Post 1952	6,631.615***	579.790	730.047	-188.800	389.199*	38.484***	-0.521
	(1,732.383)	(1,803.755)	(2,393.227)	(131.501)	(204.826)	(13.692)	(0.480)
Observations	2,244	2,341	2,341	516	222	2,218	1,998
R^2	0.951	0.891	0.892	0.948	0.765	0.910	0.864
Panel B: Reduced form							
Tons of bombs x Post 1952	71.220***	63.747*	79.573**	-5.801***	2.442	0.515**	-0.003
	(25.453)	(33.246)	(39.480)	(1.681)	(2.795)	(0.208)	(0.009)
Observations	2,244	2,341	2,341	516	222	2,218	1,998
R^2	0.949	0.895	0.896	0.952	0.751	0.908	0.863
Panel C: IV							
Reconstr. grants (M) x Post 1952	9,445.833**	8,416.682	10,506.190*	-769.282***	341.844	67.456**	-0.421
	(3,673.788)	(5,069.177)	(5,995.360)	(259.088)	(375.848)	(31.098)	(1.172)
Observations	2,244	2,341	2,341	516	222	2,218	1,998
R^2	0.950	0.875	0.879	0.937	0.765	0.906	0.864
F-statistic	36.01	36.61	36.61	36.06	26.96	37.27	34.34
Mean outcome	1,234,237	459,348	694,159	96,445	45,958	454	383
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Reconstr. grants (M)- mean	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29
Source	Yearly statistics	Yearly statistics	Yearly statistics	Decennial census	Decennial census	Yearly statistics	Yearly statistics

Notes: Panel A shows OLS regressions of agricultural outcomes on the amount of reconstruction grants received by a province (in millions). Regressions in Panel B shows reduced-form regressions of agricultural outcomes on the tons of bombs dropped during the Italian Campaign in each province. Panel C shows instrumental-variable regressions in which the reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. Regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the number of agricultural workers (column 4), the number of agricultural firms (column 5), the number of tractors (column 6), and the number of threshers (column 7). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Effects on Industrial Outcomes

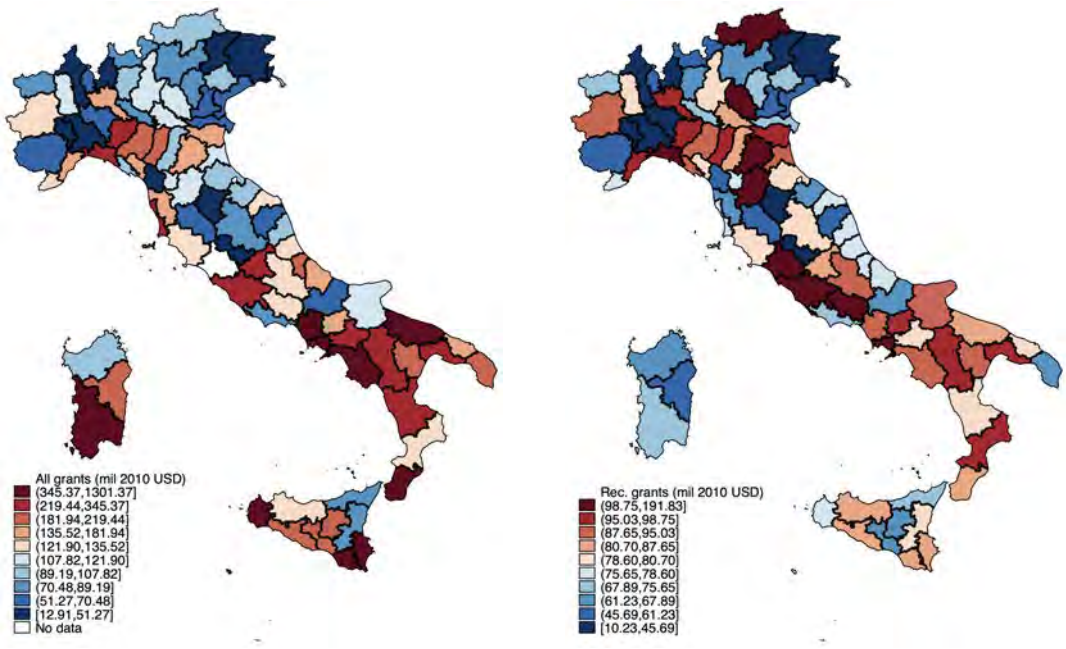
	Industrial firms (1)	Firms ≤ 10 employees (2)	Firms > 10 employees (3)	Industrial workers (4)	Blue collar (5)	Mgmt /white collar (6)	Service workers (7)
			Panel A: OLS				
Reconstr. grants (M) x Post 1952	3.753**	2.725**	-0.166	56.055**	10.958	15.203***	57.112
	(1.549)	(1.301)	(0.205)	(21.466)	(6.608)	(4.666)	(38.998)
Observations	5,454	5,443	5,443	5,443	2,709	2,025	294
R^2	0.391	0.356	0.245	0.477	0.415	0.448	0.988
			Panel B: Reduced form				
Tons of bombs x Post 1952	0.054**	0.041*	0.001	0.640***	0.135	0.170**	1.445**
	(0.025)	(0.022)	(0.003)	(0.202)	(0.085)	(0.070)	(0.716)
Observations	5,454	5,443	5,443	5,443	2,709	2,025	294
R^2	0.391	0.356	0.245	0.477	0.415	0.448	0.989
			Panel C: IV				
Reconstr. grants (M) x Post 1952	6.992**	5.378*	0.105	83.551***	19.986	26.587**	202.371*
	(3.348)	(2.908)	(0.340)	(28.260)	(12.822)	(12.125)	(114.993)
Observations	5,454	5,443	5,443	5,443	2,709	2,025	294
R^2	0.391	0.356	0.244	0.477	0.415	0.447	0.986
F-statistic	47.29	47.05	47.05	47.05	27.71	22.39	27.37
Mean outcome	704	667	36	3,969	3,068	782	16,430
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Reconstr. grants (M)- mean	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29

Notes: Panel A shows OLS regressions of industrial outcomes on the amount of reconstruction grants received by a province (in millions). Regressions in Panel B shows reduced-form regressions of industrial outcomes on the tons of bombs dropped during the Italian Campaign in each province. Panel C shows instrumental-variable regressions in which the reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. Regressions include province fixed effects, industry fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the number of firms in a province, industry, and census year (column 1), the number of firms with fewer than 10 employees (column 2), the number of firms with more than 10 employees (column 3), the number of employees (column 4), the number of blue collar workers (column 5), the number of managers and white collar workers (column 6), and the number of workers in the service sector (column 7). The industries are food, paper, chemicals, construction, mining, mechanical engineering, metallurgy, textile, and clothing. The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Online Appendix - Not For Publication

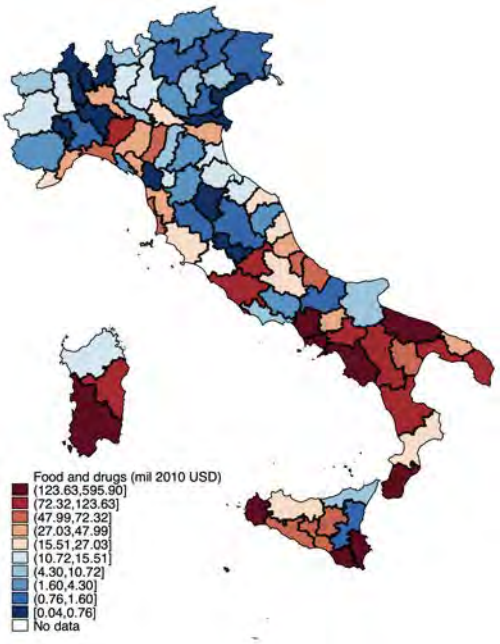
A Additional Figures and Tables

Figure A1: Maps of Reconstruction Grants



A. All ERP aid

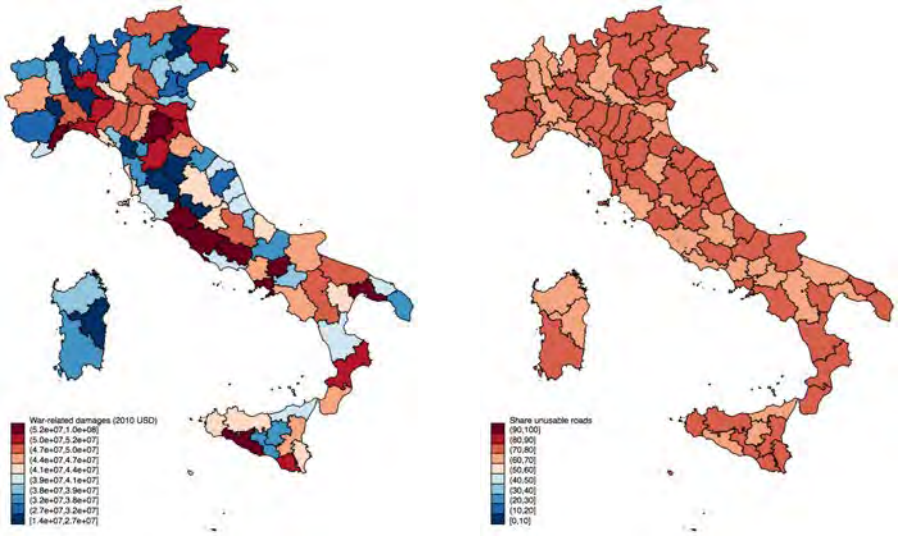
B. Reconstruction grants



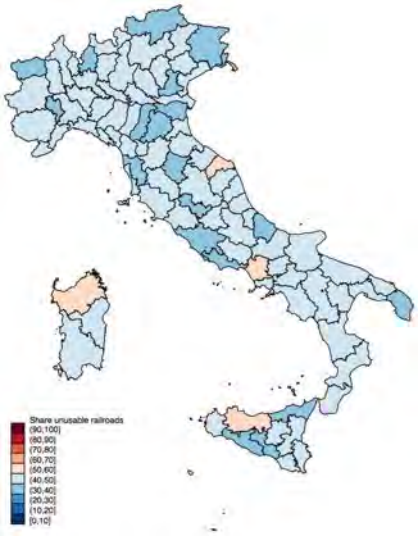
C. Food and drugs

Notes: This graph shows the distribution of ERP aid across the Italian provinces. Panel A shows all ERP aid. Panel B focuses on reconstruction grants. Panel C shows the value of food and drugs assigned to each province.
Sources: *"Missione Americana ERP in Italia", "Mutual Security Agency"* bulletins, and historical archive of the *Istituto Mobiliare Italiano.*

Figure A2: Maps of War-Related Damages



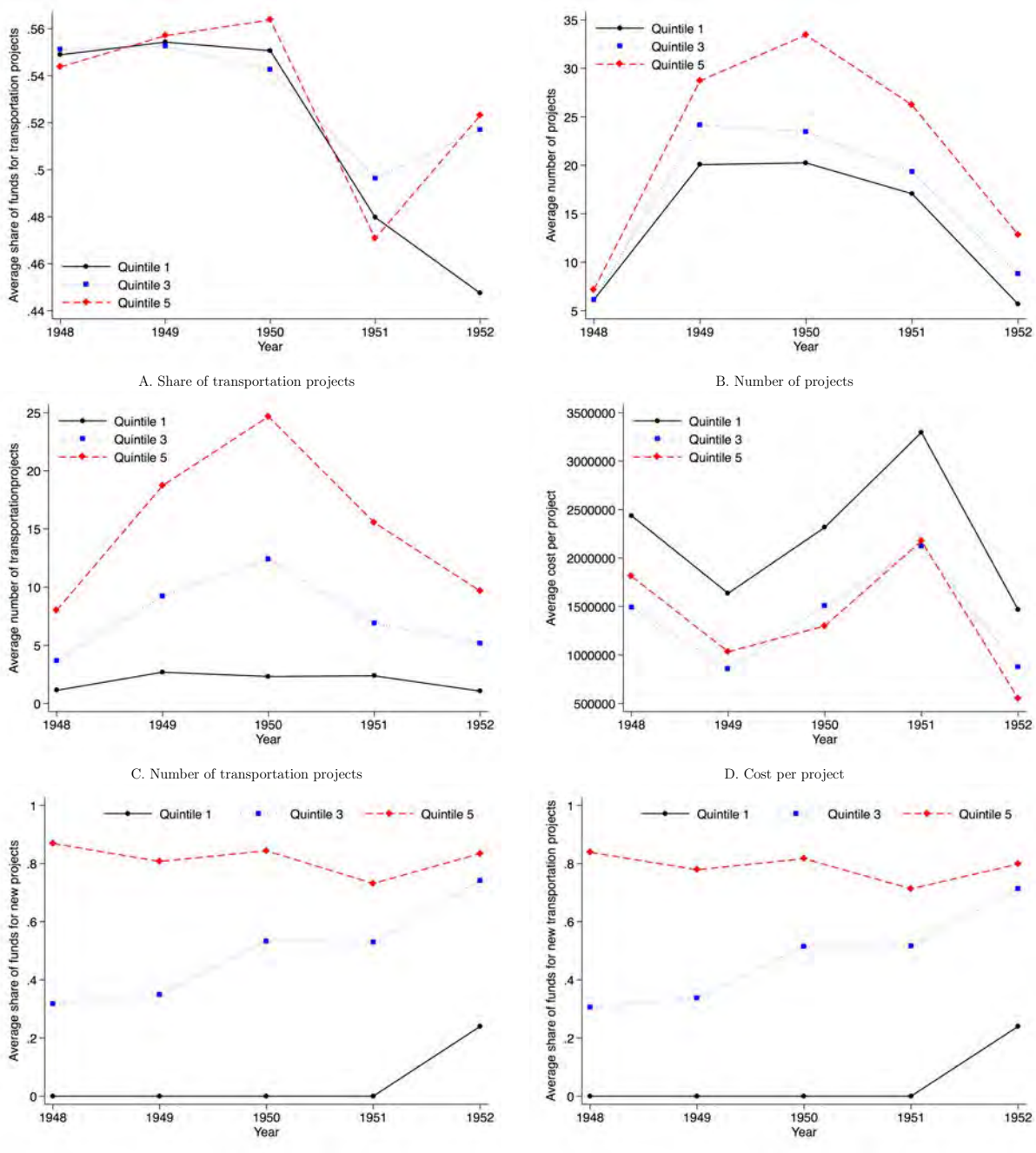
A. Damages B. Share of unusable roads



C. Share of unusable railroads

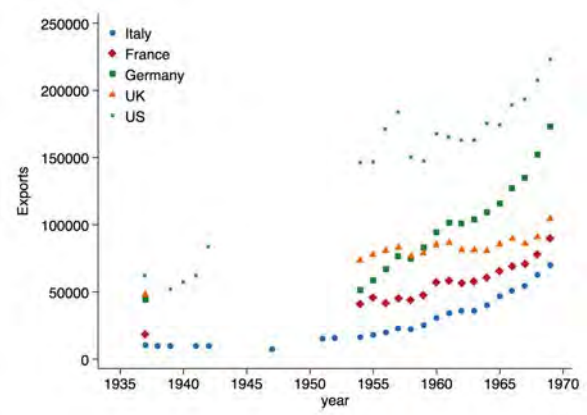
Notes: This graph shows the distribution of war-related damages across the Italian provinces. Panel A shows the monetary value of war-related damages to public infrastructure. Panel B shows the share of unusable roads. Panel C shows the share of unusable railroads.
Source: *"Italy Country Study,"* 1947.

Figure A3: Funded Projects

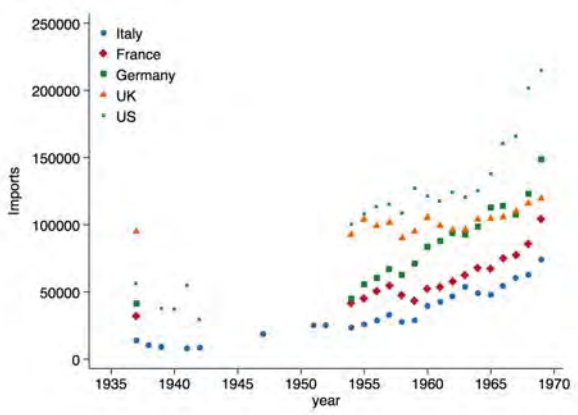


Notes: These graphs show shows statistics on the projects funded through ERP reconstruction aid for provinces in different quintiles of the distribution of explosives dropped during the Italian Campaign. The variables are the share of grants used for transportation projects (panel A), the number of projects (panel B), the number of transportation projects (panel C), the average cost per project (panel D), the share of funds used for new projects (panel E), and the share of funds used for new transportation projects (panel F). Costs are expressed in 2010 USD. "New projects" identifies public works that did not reconstruct public infrastructure that was present before WWII. Sources: *"Missione Americana ERP in Italia", "Mutual Security Agency"* bulletins, and the historical archive of the *Istituto Mobiliare Italiano.*

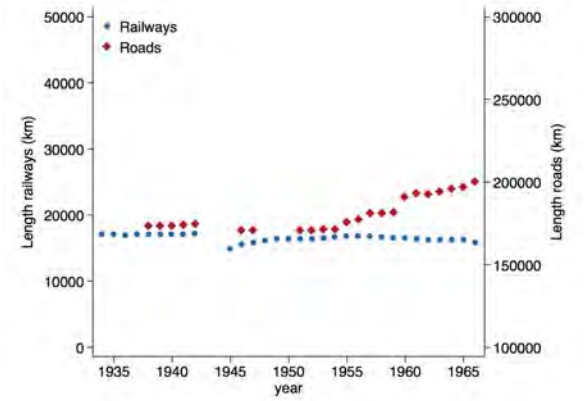
Figure A4: National Time Series



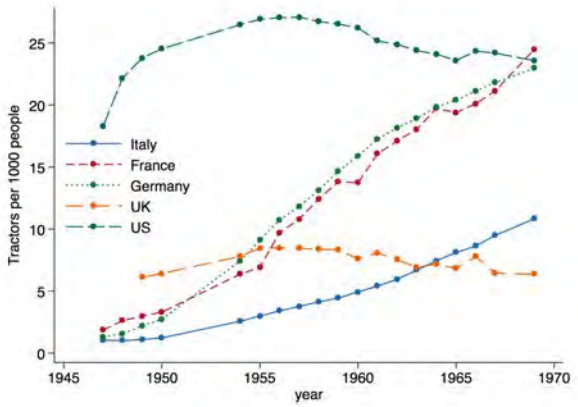
A. Exports (2016 €)



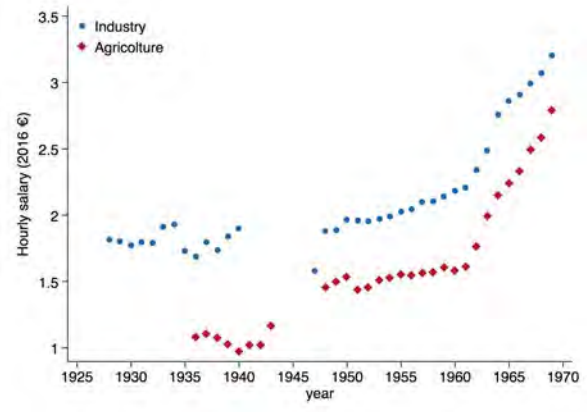
B. Imports (2016 €)



C. Infrastructure stock



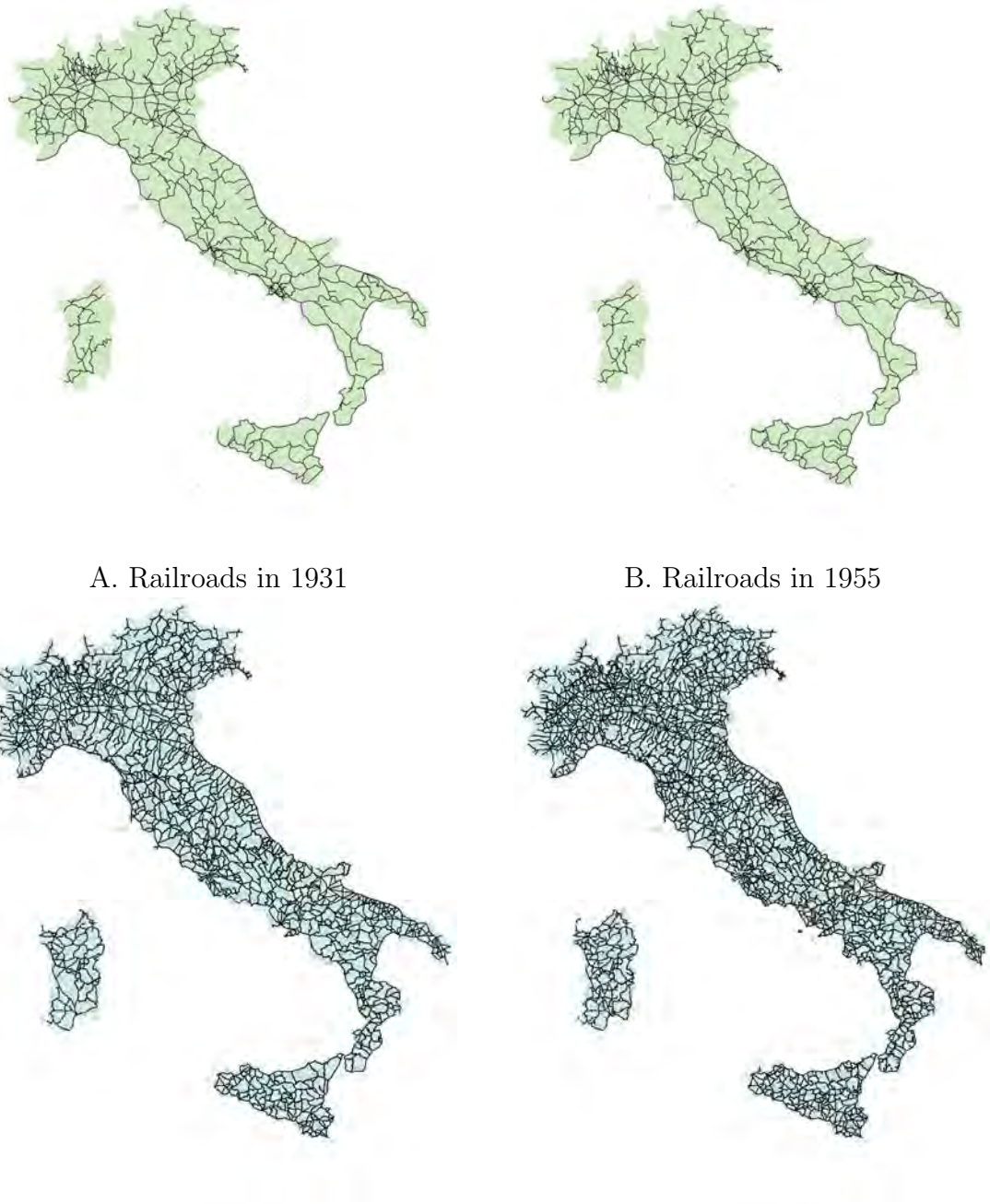
D. Tractors per 1000 people



E. Salaries

Notes: These graphs show four different national time series: yearly value of exports (panel A) and imports (panel B) in 2016 € with international comparisons, infrastructure stock (panel C), tractors per 1000 people (panel D), and salaries in industry and agriculture (panel E). Source: Annuario di Statistica Agraria, Istituto Nazionale di Statistica.

Figure A5: Railroad and Road Network



A. Railroads in 1931

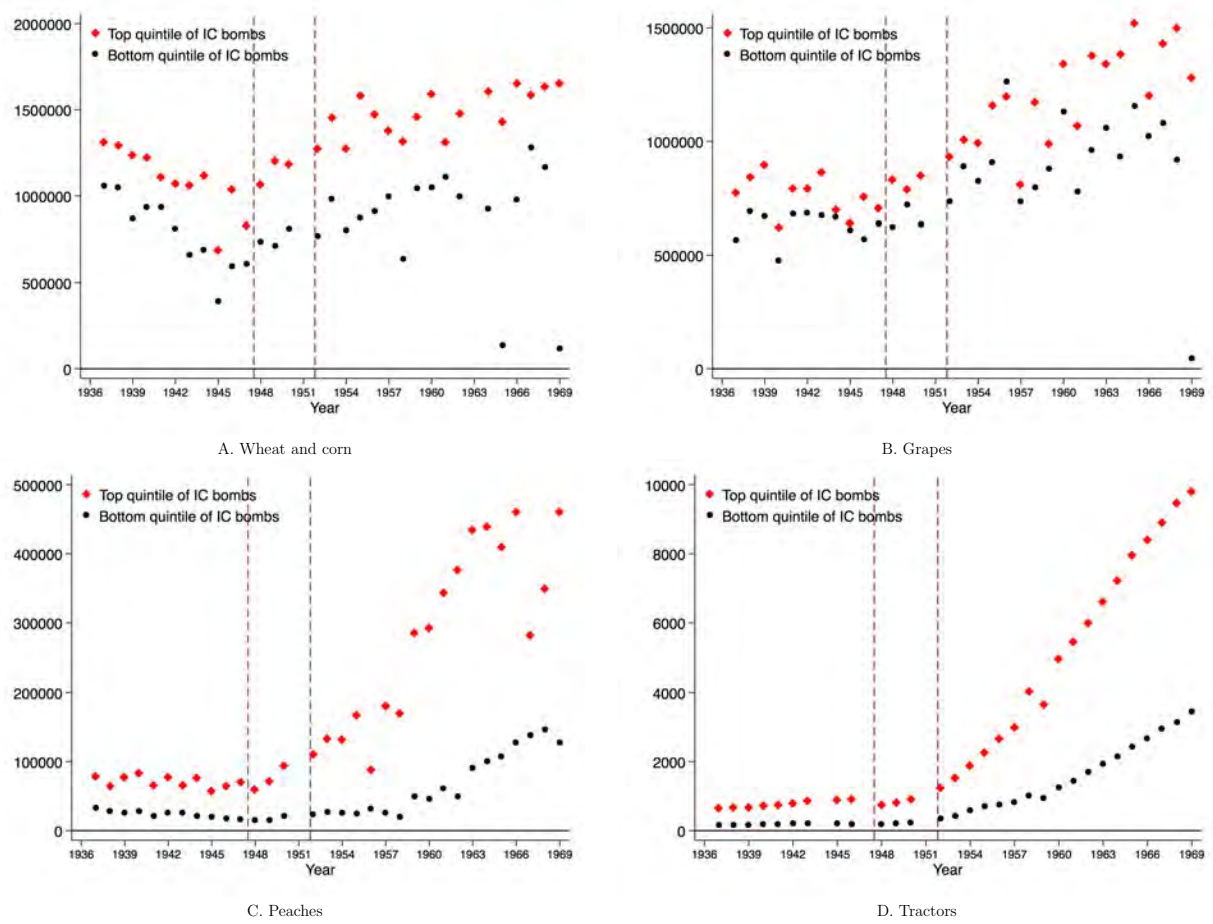
B. Railroads in 1955

C. Roads in 1938

D. Roads in 1957

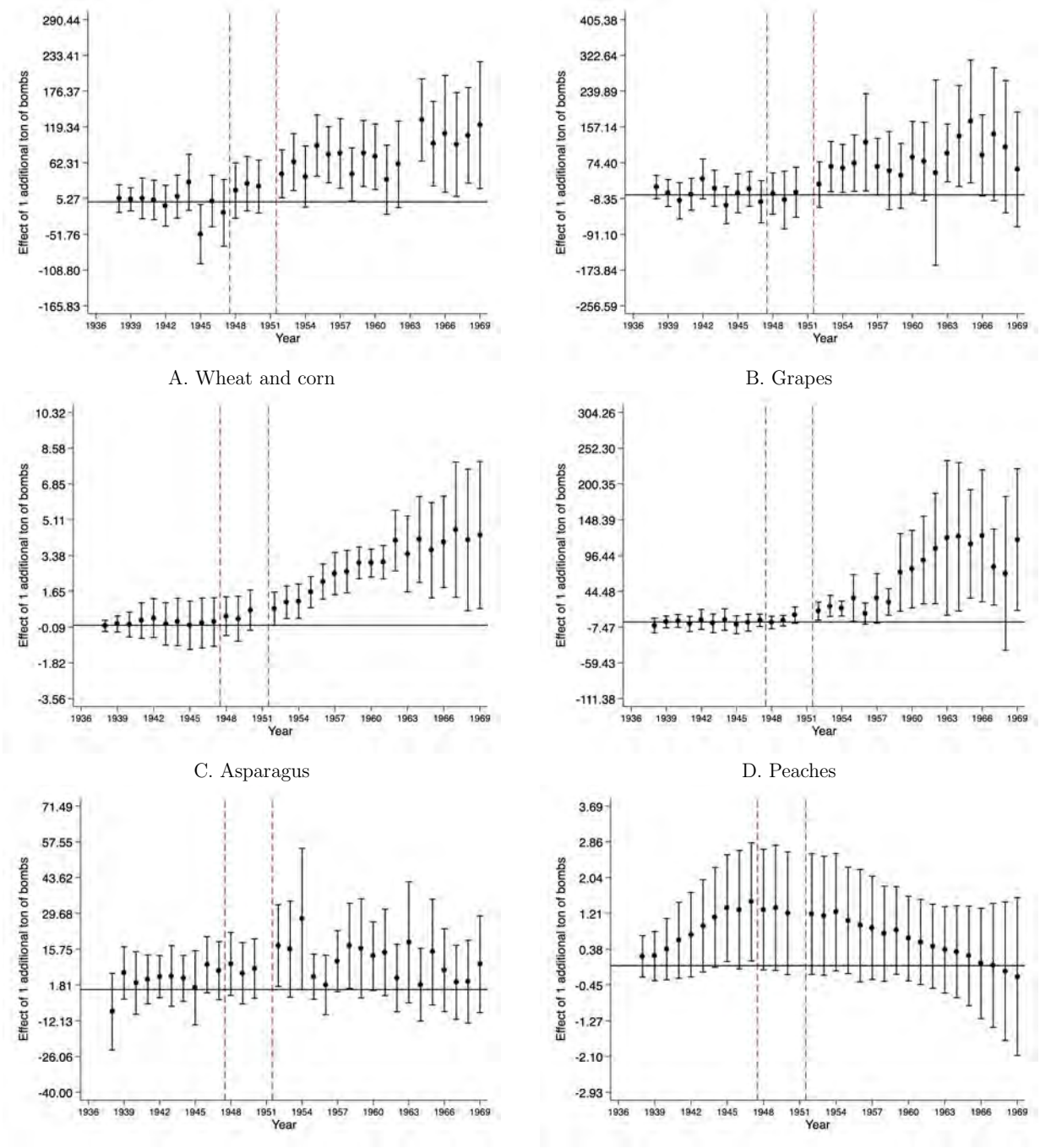
Notes: These graphs show the Italian railroad and road network just before WWII and immediately after the Marshall Plan. We digitized the railroads in 1931 from the railroad map of Italy by the cartographer Pozzo (http://www.stagniweb.it/foto6.asp?Tipo=random&Foto=altro2/mappe3/fer931_.jpg&Percorso=mappefer and in 1955 from a railroad map of Italy published by the Ministry of Transportation (http://www.stagniweb.it/foto6.asp?Tipo=random&Foto=mappe/fer955_.jpg&Percorso=mappefer). Similarly, we digitized the roads in 1938 and in 1957 from the official maps of the Italian Automobile Association (ACI).

Figure A6: Recovery vs. Expansion



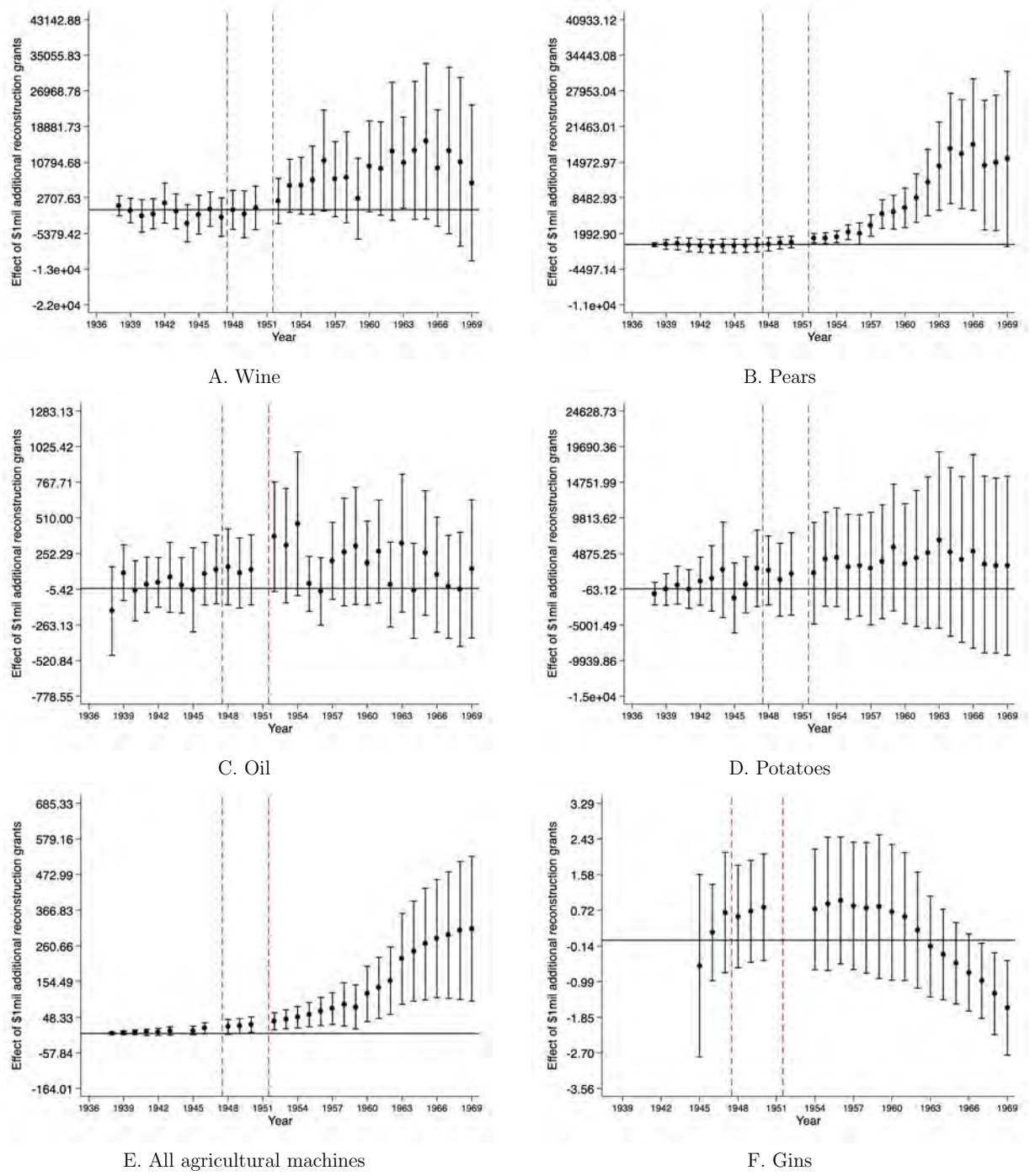
Notes: These graphs show the trends in average outcomes between provinces in the top and bottom quintile of bombing during the Italian Campaign. The outcomes are the production of wheat and corn (100kg, panel A), grapes (100kg, panel B), peaches (100kg, panel C), and the number of tractors (panel D). Sources: Censimento dell'Industria e dei Servizi, Annuario di Statistica Agraria, Censimento Generale della Popolazione, Istituto Nazionale di Statistica. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Figure A7: Reduced Form, Effects of IC Bombings on Agricultural Production



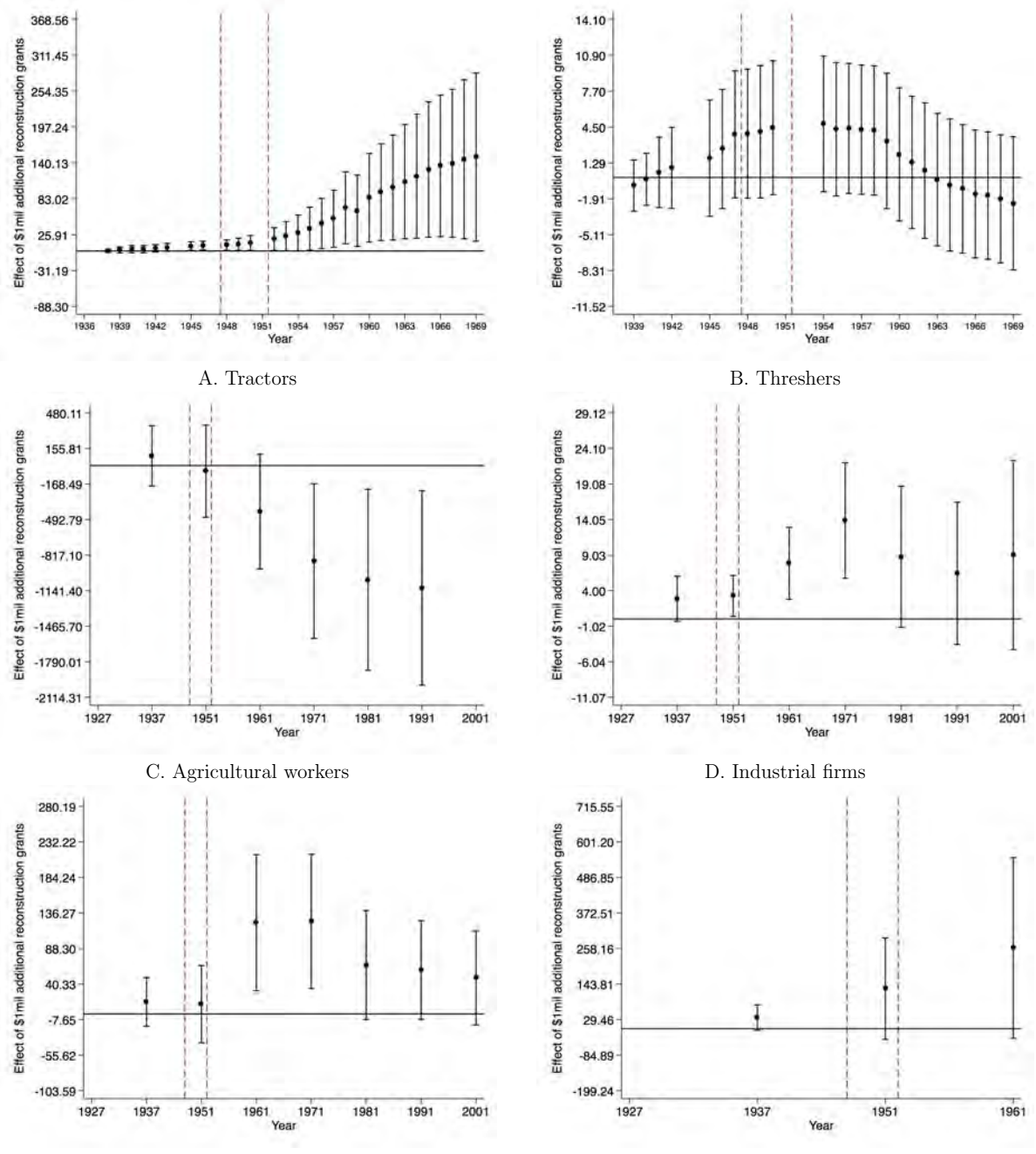
Notes: These graphs show the effect of one ton of IC bombs on different crops. The regressions also include province fixed effects and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, employment rate, horsepower, share of industrial workers, share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the production of wheat and corn in each province, and year (100kg, panel A), grapes (100kg, panel B), asparagus (100kg, panel C), peaches (100kg, panel D), olives (100kg, panel E), walnuts (100kg, panel F). Sources: Censimento dell'Industria e dei Servizi, Istituto Nazionale di Statistica. USAF THOR Database, available at www.afri.au.af.mil/thor.

Figure A8: IV, Other Graphs on Italian Recovery



Notes: These graphs show the effect of of an additional $1 million in reconstruction grants on different outcomes. The amount of reconstruction grants received by a province is instrumented with the amount of explosives dropped during the Italian Campaign. The regressions also include province fixed effects and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, horsepower, employment rate, share of industrial workers, share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the production of wine (100L, panel A), pears (100kg, panel B), olive oil (100L, panel C), potatoes (100kg, panel D), the number of all agricultural machines (panel E), and the number of gins (panel F). Sources: Annuario di Statistica Agraria, Istituto Nazionale di Statistica. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Figure A9: IV Effects of Reconstruction Grants on Technology and Labor Markets



A. Tractors

B. Threshers

C. Agricultural workers

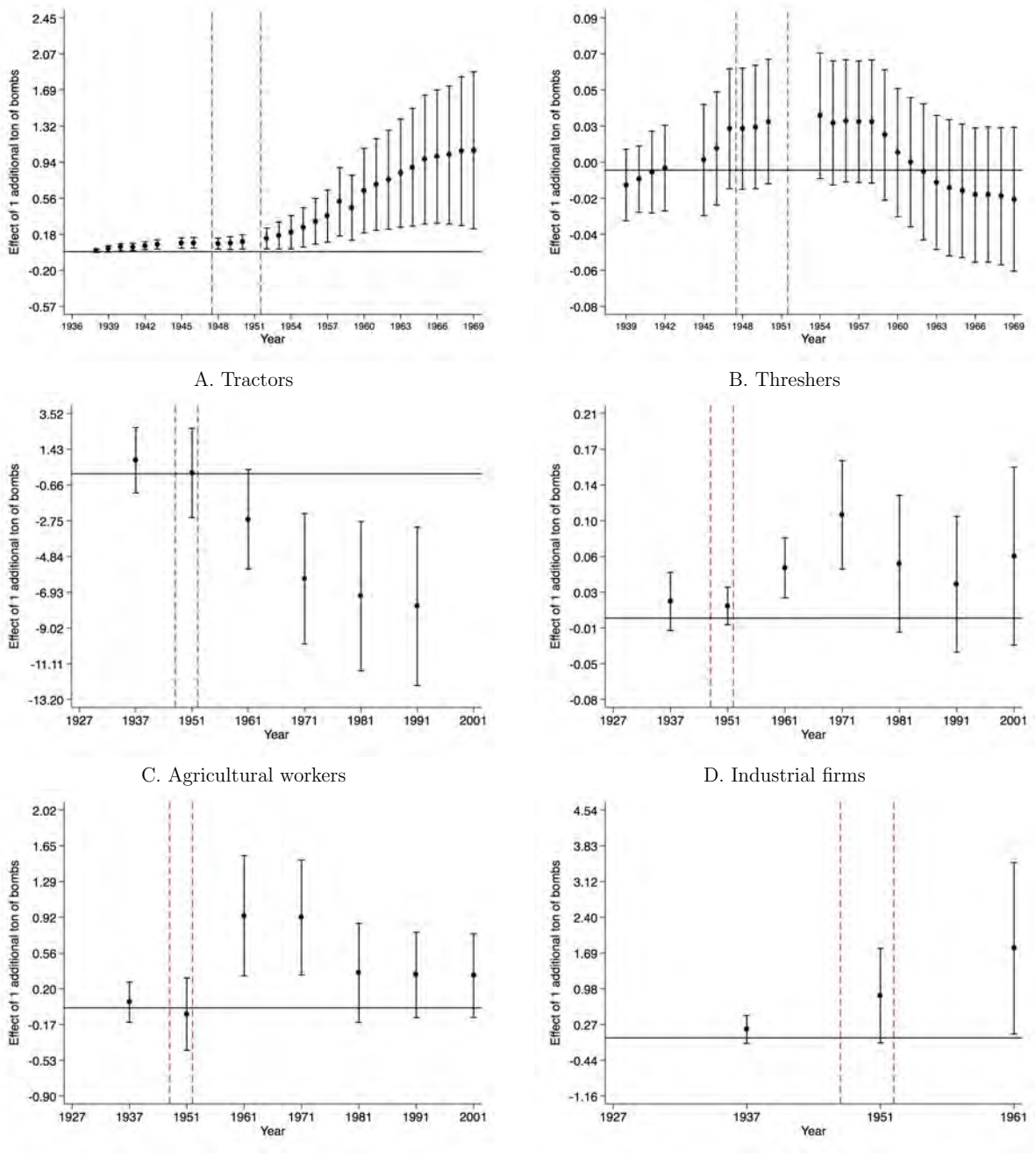
D. Industrial firms

E. Industrial workers

F. Service workers

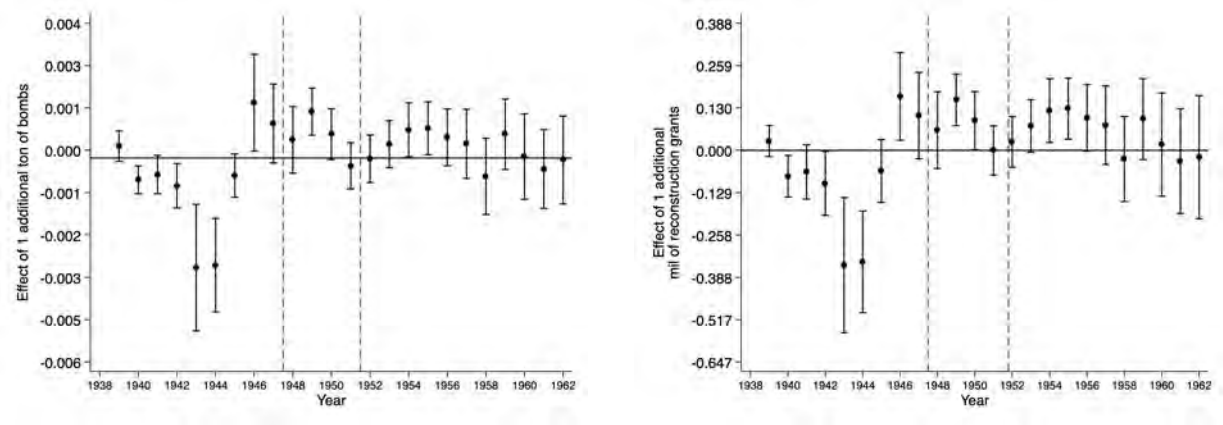
Notes: These graphs show the effect of an additional $1 million in reconstruction grants on different outcomes. The amount of reconstruction grants received by a province is instrumented with the amount of explosives dropped during the Italian Campaign. The regressions also include province fixed effects, industry fixed effects (in panels D and E) and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, employment rate, horsepower, share of industrial workers, share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the number of tractors in each province (panel A), the number of nonmotorized threshers (panel B), the number of agricultural workers (panel C), the number of firms active in each province, industry, and year (panel D), the number of industrial workers in each province, industry, and year (panel E), and the number of workers in the service sector (panel F). Sources: Censimento dell'Industria e dei Servizi, Istituto Nazionale di Statistica. USAF THOR Database, available at www.afri.au.af.mil/thor.

Figure A10: Reduced Form, Effects of IC Bombings on Technology and Labor Markets



Notes: These graphs show the effect of one ton of IC bombs on different outcomes. The regressions also include province fixed effects, industry fixed effects (in panels D and E) and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, employment rate, horsepower, share of industrial workers, share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the number of tractors in each province (panel A), the number of nonmotorized threshers (panel B), the number of agricultural workers (panel C), the number of firms active in each province, industry, and year (panel D), the number of industrial workers in each province, industry, and year (panel E), and the number of workers in the service sector (panel F). Source: Censimento dell'Industria e dei Servizi, Istituto Nazionale di Statistica. USAF THOR Database, available at www.afri.au.af.mil/thor.

Figure A11: Development of Intellectual Property

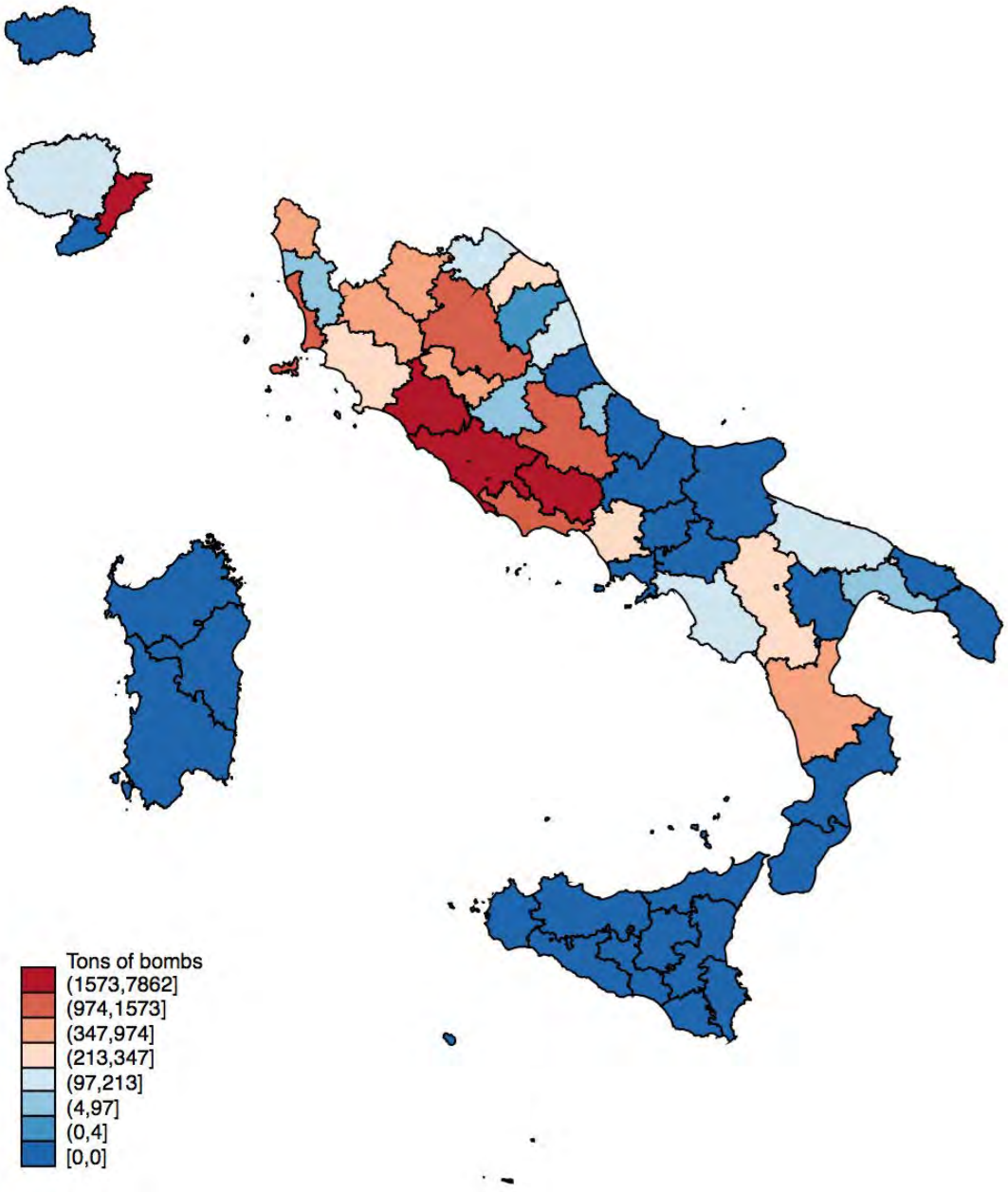


A. OLS reduced form

B. Instrumental variable

Notes: These graphs show the effect of one ton of IC bombs (panel A) or $1 million of reconstruction grants (panel B) on different types of patents. The regressions also include province fixed effects, patent class fixed effects and region-year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, employment rate, horsepower, share of industrial workers, and share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the number of patents per province, and year. Sources: Bollettino della Proprietà Intellettuale, Ministero dell'Agricoltura, dell'Industria, e del Commercio. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Figure A12: Provinces at Least 500km Away From Brenner Pass



Notes: Sample of provinces that are at least 500km away from the Brenner Pass, which connects Italy to Austria and Germany. The map shows the tons of bombs dropped by Allied air strikes during the Italian Campaign on this restricted group of provinces. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Figure A13: Treatment Effects in Different Regions

A. Wheat and corn production

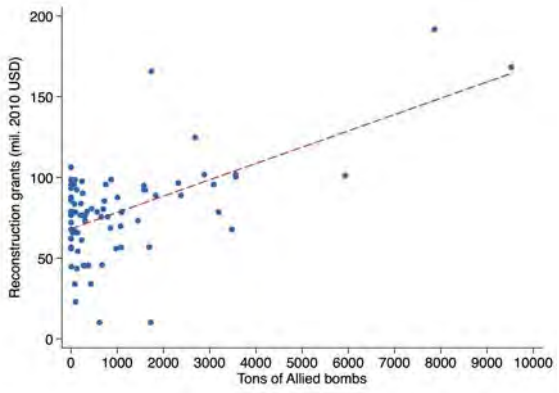
B. Wine production

C. Agricultural workers

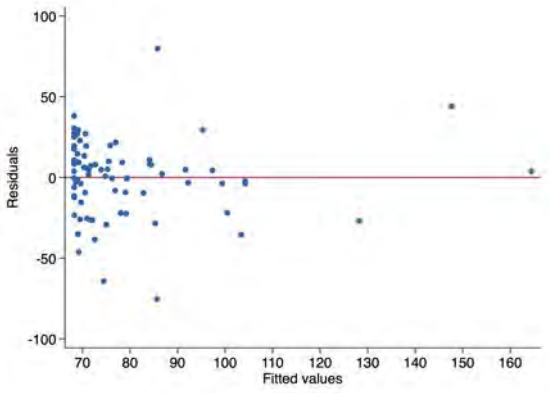
D. Industrial workers

Notes: These graphs show the treatment effects for a 1 standard deviation increase in Allied bombings on the production of wheat and corn (panel A), the production of wine (panel B), the number of agricultural workers (panel C), the number of industrial workers (panel D).

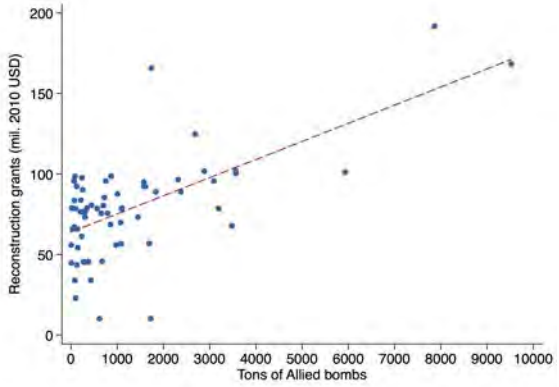
Figure A14: Investigate the Linearity Between Bombings and Reconstruction Grants



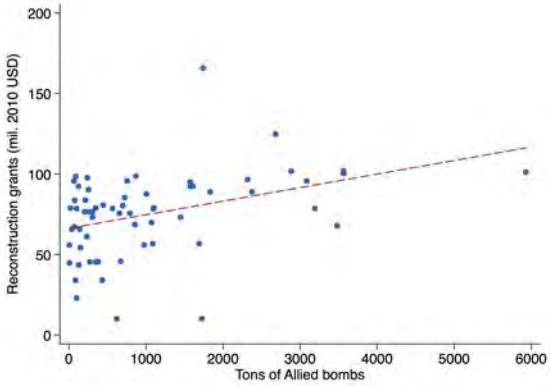
A. Scatterplot of bombings and grants



B. Rvfplot



C. Scatterplot dropping locations with 0 bombings



D. Scatterplot dropping locations with 0 and >7000 tons of bombs

Notes: These scatterplots show the province-level relationship between tons of bombs dropped by the Allied air forces during the Italian Campaign and the amount of reconstruction grants received through the Marshall Plan. Panel A includes all the provinces in the main sample. Panel B tests the linearity of this relationship by showing its residuals against the fitted values (rvfplot). Panel C drops provinces without bombings. Panel D drops provinces without bombings and provinces that received more than 7,000 tons of bombs. Source: "Missione Americana ERP in Italia," *"Mutual Security Agency"* bulletins, and historical archive of the Istituto Mobiliare Italiano.

Table A1: Correlation between Local Ideology and Reconstruction Grants

	Reconstruction grants (M)	Tons of IC bombs	Reconstruction grants (M)	Tons of IC bombs
	(1)	(2)	(3)	(4)
	1946 national election		1948 national election	
Share of votes for Democrazia Cristiana (center/christian)	-0.191	-7.362	0.305	21.371
	(0.403)	(25.052)	(0.600)	(37.400)
Share of votes for Fronte dell'Uomo Qualunque (conservative/center-right)	0.733	5.863		
	(0.789)	(42.717)		
Share of votes for Partito Comunista Italiano (far left)	0.619	19.530		
	(0.419)	(25.659)		
Share of votes for Partito Socialista Italiano di Unità Proletaria (far left)	-0.757	22.616		
	(0.542)	(31.065)		
Share of votes for Unione Democratica Nazionale (center)	0.782	-19.416		
	(0.618)	(30.857)		
Share of votes for Blocco Nazionale (conservative/center-right)			0.822	-24.762
			(0.624)	(30.896)
Share of votes for Fronte Democratico Popolare (far left)			0.526	33.914*
			(0.381)	(17.142)
Share of votes for Partito Repubblicano Italiano (center)			0.246	61.895
			(0.654)	(37.406)
Share of votes for Unità Socialista (left)			-1.882	54.293
			(1.164)	(65.925)
Partial f-test PCI-PSIUP (p-value)	0.215	0.491		
Partial f-test Fronte-Unità Socialista (p-value)			0.201	0.066
Mean dependent variable	79	1,033	79	1,033
Std. dev. dependent variable	29	1,684	29	1,684

Notes: This table correlates the province-level amount of reconstruction grants disbursed through the Marshall Plan (in millions) and province-level tons of bombs dropped by Allied air forces during the Italian Campaign on province-level share of votes for the five political parties or coalitions that received the highest vote share in the 1946 and 1948 elections. At the bottom, the table includes p-values from the partial f-tests of joint significance of the coefficients of the center-left and far-left parties. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sources: Ministero dell'Interno. USAF Theater History of Operations Reports (THOR).

Table A2: Correlation between Characteristics of Funded Projects and Bombing

	IC bombs	Mean	Standard deviation	Observations
	(1)	(2)	(3)	(4)
Share of grants used for transp. network (1948-1952)	-0.000	0.525	0.0168	79
	(0.002)			
Share of grants used for hygiene infrastr. (1948-1952)	0.007	0.155	0.0776	79
	(0.008)			
Share of grants used for public buildings (1948-1952)	-0.007	0.321	0.0780	79
	(0.007)			
Number of projects (1948-1952)	21.531***	77.04	58.73	79
	(7.955)			
Number of projects in 1948	1.302**	5.716	4.217	79
	(0.526)			
Number of projects in 1949	5.357**	21.79	17.20	79
	(2.356)			
Number of projects in 1950	6.910***	23.04	18.64	79
	(2.536)			
Number of transp. projects (1948-1952)	20.262***	37.80	41.63	79
	(6.173)			
Number of transp. projects in 1948	2.091**	3.778	5.045	79
	(0.854)			
Number of transp. projects in 1949	4.257***	9.654	9.393	79
	(1.328)			
Number of transp. projects in 1950	6.871***	11.80	14.12	79
	(2.021)			
Cost per project (1948-1952)	-218,724.424*	1,773,641	1,880,658	79
	(118,601.445)			
Cost per project in 1948	-204,466.826*	1,931,482	1,967,943	79
	(116,268.907)			
Cost per project in 1949	-102,277.500	1,212,103	1,295,238	79
	(92,640.737)			
Cost per project in 1950	-220,747.402*	1,872,237	2,046,273	79
	(119,923.682)			
Share of grants used for new infrastructure (1948-1952)	0.096***	0.484	0.340	79
	(0.031)			
Share of grants used for new infrastructure in 1948	0.126***	0.432	0.437	79
	(0.041)			
Share of grants used for new infrastructure in 1949	0.113***	0.408	0.373	79
	(0.036)			
Share of grants used for new infrastructure in 1950	0.096***	0.518	0.380	79
	(0.035)			
Share of grants used for new transp. infrastr. (1948-1952)	0.092***	0.469	0.329	79
	(0.030)			
Share of grants used for new transp. infrastr. in 1948	0.121***	0.416	0.419	79
	(0.039)			
Share of grants used for new transp. infrastr. in 1949	0.109***	0.394	0.360	79
	(0.035)			
Share of grants used for new transp. infrastr. in 1950	0.092***	0.501	0.368	79
	(0.034)			

Notes: Each row-column combination shows the coefficient β_1 from a different regression of the characteristics of projects funded through ERP reconstruction grants and the tonnage of bombs in a province (*in thousands of tons*): $\text{Projects}_p = \beta_0 + \beta_1 \cdot \text{IC bombs}_p + \gamma_r + \varepsilon_p$. The "Share of grants" divide the amount of grants used for a specific purpose by the total amount of grants received between 1948 and 1952 or in a given year. Column 2 shows the mean of each dependent variable, while column 3 shows the standard deviation. The regression also includes region fixed effects (γ_r). Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Sources: Censimento dell'Industria e dei Servizi, Annuario di Statistica Agraria, Censimento Generale della Popolazione, Istituto Nazionale di Statistica. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

Table A3: Changes in Commuting Distance to Provincial Capitals

	Δ mean comm. distance (1)	Δ mean comm. distance (2)	Δ mean comm. distance (3)	Δ median comm. distance (4)	Δ median comm. distance (5)	Δ median comm. distance (6)
	Panel A: All municipalities					
All reconstruction grants (M)	-57.613			8.617		
	(47.244)			(45.802)		
Grants for transportation (M)		-1,557.328*	-1,570.916*		-2,024.700**	-2,042.328**
		(799.941)	(799.396)		(865.809)	(865.857)
Grants for sanitation (M)		1,438.152*			2,045.528**	
		(818.543)			(888.439)	
Grants for public buildings (M)		1,675.012*			2,352.813**	
		(863.504)			(937.634)	
Grants for nontransp. projects (M)			1,606.152*			2,263.479**
			(827.851)			(900.070)
Observations	79	79	79	79	79	79
Mean—dep. var.	-12,547	-12,547	-12,547	-9,402	-9,402	-9,402
Std. dev.—dep. var.	22,095	22,095	22,095	25,186	25,186	25,186
	Panel B: Only in-network municipalities before WWII					
All reconstruction grants (M)	-57.826			-0.468		
	(47.043)			(44.159)		
Grants for transportation (M)		-1,631.389*	-1,641.718**		-2,022.354**	-2,038.368**
		(820.164)	(818.356)		(862.592)	(862.635)
Grants for sanitation (M)		1,555.835*			2,042.049**	
		(838.870)			(880.796)	
Grants for public buildings (M)		1,735.894*			2,321.212**	
		(874.177)			(930.367)	
Grants for nontransp. projects (M)			1,683.547**			2,240.054**
			(841.522)			(892.838)
Observations	79	79	79	79	79	79
Mean—dep. var.	-12,083	-12,083	-12,083	-9,353	-9,353	-9,353
Std. dev.—dep. var.	21,871	21,871	21,871	24,845	24,845	24,845

Notes: This table shows the correlation between the change in commuting distance to the provincial capital and the amount of reconstruction grants. For each municipality, we computed the shortest commuting distance in meters to its provincial capital in 1938 and 1957 using the road network that we digitized from official road maps by the Italian Automobile Association. We then computed its post-WWII change. Finally, we computed the mean (columns 1 to 3) and median (columns 4 to 6) change for each Italian province. We regressed these variables on different measures of the amount of reconstruction grants assigned to each province. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A4: IV Effects on Agricultural Outcomes, Coefficients of All Trends

	Wheat & corn production (1)	Wine production (2)	Grape production (3)	Agricultural workers (4)	Agricultural firms (5)	Tractors (6)	Threshers (7)
Reconstr. grants (M) x Post 1952	9,445.833**	8,416.683	10,506.192*	-769.282***	341.844	67.456**	-0.421
	(3,673.788)	(5,069.177)	(5,995.361)	(259.088)	(375.848)	(31.098)	(1.172)
Share of war deaths x Trend	-5098073.068	16895994.318	23215508.564	35,766.811	-10,829.872	6,469.150	-2,801.834
	(15754399.092)	(20430211.385)	(28863276.925)	(151,814.065)	(134,811.577)	(73,312.641)	(5,419.245)
Share of war deaths x Trend^2	200,918.372	-714,572.358	-961,887.822	184.240	151.213	-548.473	123.016
	(529,669.595)	(749,909.908)	(1040239.310)	(4,922.417)	(1,678.588)	(2,742.359)	(170.118)
Share of war deaths x Trend^3	-2,271.565	9,726.799	12,742.125	-7.429		12.824	-1.444
	(5,587.221)	(8,807.190)	(11,958.817)	(41.052)		(30.553)	(1.822)
Pop. density x Trend	27,756.677	-81,681.781**	-133,318.747**	-9.116	116.094	172.395	5.549
	(57,717.280)	(37,889.160)	(54,313.840)	(6.121)	(485.177)	(135.046)	(14.309)
Pop. density x Trend^2	-1,197.875	2,640.070*	4,376.108**	0.118	-1.050	-5.774	-0.272
	(1,833.173)	(1,363.292)	(1,953.684)	(0.172)	(5.568)	(5.226)	(0.465)
Pop. density x Trend^3	12.571	-25.443*	-43.251**	-0.001		0.060	0.003
	(18.015)	(14.984)	(21.597)	(0.001)		(0.065)	(0.006)
Empl. rate x Trend	4129178.449*	2411053.797	3568800.680	-31,770.078*	-23,732.409	9,059.307	-2,603.799
	(2424925.897)	(1962281.106)	(2506678.916)	(16,912.362)	(23,180.989)	(8,421.424)	(1,971.329)
Empl. rate x Trend^2	-143,809.914*	-93,964.935	-134,824.221	1,218.143*	305.379	-411.771	78.704
	(84,210.906)	(73,875.264)	(94,239.427)	(622.813)	(281.669)	(310.666)	(55.512)
Empl. rate x Trend^3	1,513.893*	1,078.169	1,503.330	-11.222**		5.371	-0.795
	(889.003)	(840.456)	(1,068.124)	(5.319)		(3.343)	(0.515)
Horsepower x Trend	-1.929***	0.620	0.878	0.013**	0.000	-0.002	-0.000
	(0.482)	(0.412)	(0.572)	(0.005)	(0.004)	(0.001)	(0.000)
Horsepower x Trend^2	0.064***	-0.020	-0.029	-0.000**	-0.000	0.000	0.000
	(0.016)	(0.015)	(0.021)	(0.000)	(0.000)	(0.000)	(0.000)
Horsepower x Trend^3	-0.001***	0.000	0.000	0.000**		-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)
Share ind. workers x Trend	30,895.140	-1872505.579	-2318304.749	32,936.892	44,367.657*	-4,851.746	1,236.869
	(2408923.927)	(2418899.105)	(3050890.970)	(20,414.322)	(23,662.545)	(9,366.854)	(1,549.163)
Share ind. workers x Trend^2	16,433.871	72,621.055	89,095.885	-1,027.632	-628.299**	322.236	-36.274
	(83,560.794)	(90,105.401)	(114,212.469)	(686.023)	(286.369)	(348.425)	(46.974)
Share ind. workers x Trend^3	-340.332	-829.060	-995.244	9.331		-5.463	0.381
	(884.067)	(1,010.510)	(1,282.619)	(5.763)		(3.788)	(0.485)
Share agri. workers x Trend	-1922213.997	-2430719.519	-3409745.816	44,394.375***	23,476.514	-6,969.941	924.843
	(2021358.481)	(2186898.703)	(2797787.551)	(15,964.148)	(21,714.604)	(8,544.738)	(1,398.386)
Share agri. workers x Trend^2	73,950.711	90,071.224	123,811.567	-1,552.603**	-313.134	350.692	-24.455
	(71,414.712)	(81,732.235)	(104,598.753)	(592.838)	(258.816)	(317.494)	(40.016)
Share agri. workers x Trend^3	-838.043	-981.025	-1,322.231	13.585***		-4.834	0.226
	(760.842)	(923.297)	(1,179.694)	(5.060)	(375.848)	(3.434)	(0.377)
Mean outcome	1,234,237	459,348	694,159	96,445	45,958	454	383
Reconstr. grants (M)- mean	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29
Partial F-test—share of deaths	0.940	0.060	0.183	0.747	0.992	0.101	0.224

Notes: This table shows all the coefficients from nonlinear trends included in IV regressions (Table 6, panel C). Regressions also include province fixed effects and region-year fixed effects. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the number of agricultural workers (column 4), the number of agricultural firms (column 5), the number of tractors (column 6), and the number of threshers (column 7). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Tests for Weak Instrument

	Wheat & corn production (1)	Wine production (2)	Grape production (3)	Agricultural workers (4)	Agricultural firms (5)	Tractors (6)	Threshers (7)
Montiel Olea-Pflueger effective F-statistic							
Effective F-statistic	33.91	34.51	34.51	29.75	16.69	35.11	32.18
Critical value 5% significance	37.42	37.42	37.42	37.42	37.42	37.42	37.42
Critical value 10% significance	23.11	23.11	23.11	23.11	23.11	23.11	23.11
Identification robust Anderson-Rubin confidence intervals							
AR lower bound	4,144.80	918.90	1,631.91	-1,276.52	-322.67	22.20	-2.16
AR upper bound	16,244.10	18,495.40	22,418.90	-394.40	942.84	129.95	1.69
Mean outcome	1,234,237	459,348	694,159	96,445	45,958	454	383
Reconstr. grants (M)- mean	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29

Notes: This table follows the best practices indicated by Andrews, Stock, and Sun (2019) on how to test for a weak instrument in the case of a single endogenous variable. We first report a test on instrument strength based on the effective F-statistic of Olea and Pflueger (2013). Then, we report identification-robust Anderson-Rubin confidence intervals (Anderson and Rubin, 1949).

Table A6: Additional Outcomes

	Population	Total wages	Average wage	Illiterate individuals	Non-agri area	Wheat and corn area	Gins	All machines
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Reduced form				
Tons of bombs x Post 1952	14.378	4,724.488**	-4.518	0.183	0.050	0.127	-0.002	0.950***
	(21.042)	(1,915.477)	(4.532)	(1.833)	(0.430)	(0.468)	(0.002)	(0.291)
Observations	588	2,736	2,635	368	1,628	2,247	1,702	2,218
R^2	0.978	0.399	0.090	0.968	0.970	0.984	0.958	0.928
				Panel B: IV				
Reconstr. grants (M) x Post 1952	1,931.305	650,582.865***	-627.841	24.863	6.307	16.876	-0.250	124.444***
	(2,914.216)	(215,754.828)	(648.509)	(248.751)	(54.696)	(61.436)	(0.273)	(42.172)
Observations	588	2,736	2,635	368	1,628	2,247	1,702	2,218
R^2	0.979	0.399	0.090	0.968	0.970	0.985	0.958	0.927
F-statistic	34.81	36.24	35.04	32.81	40.95	36.24	35.62	37.27
Mean outcome	461,828	11,339,233	2294	73,733	27,142	69,992	78	773
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Reconstr. grants (M)- mean	79	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29	29
Source	Decennial census	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics	Yearly statistics

Notes: Regressions include province fixed effects, industry fixed effects (first four columns), region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. Panel B shows instrumental-variable regressions in which the reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. The dependent variables are the residential population (column 1), the wage bill in an industry, province, and year (column 2), the average wage (column 3), the number of illiterate individuals (column 4), the hectares not used for agriculture (column 5), the hectares used for wheat and corn (column 6), the number of gins (column 7), and the number of all motorized agricultural machines (column 8). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Additional Crops

	Asparagus (1)	Peaches (2)	Pears (3)	Walnuts (4)	Potatoes (5)	Olive Oil (6)	Olives (7)	Tomatoes (8)
				Panel A: Reduced form				
Tons of bombs x Post 1952	2.567***	62.823**	55.429***	-0.286	20.482	1.007	6.919	-32.349
	(0.336)	(27.289)	(11.883)	(0.351)	(25.464)	(1.007)	(5.334)	(24.231)
Observations	2,365	2,367	2,368	2,368	2,368	2,368	2,368	2,368
R^2	0.753	0.799	0.596	0.955	0.890	0.895	0.892	0.814
				Panel B: IV				
Reconstr. grants (M) x Post 1952	337.445***	7,407.986*	7,296.070***	-37.701	2,696.017	132.559	910.686	-4,258.069
	(63.275)	(4,178.452)	(2,069.120)	(46.848)	(3,221.773)	(137.567)	(744.461)	(3,251.304)
Observations	2,365	2,367	2,368	2,368	2,368	2,368	2,368	2,368
R^2	0.644	0.721	0.540	0.954	0.891	0.895	0.892	0.807
F-statistic	36.80	42.38	36.66	36.66	36.66	36.66	36.66	36.66
Mean outcome	1,472	30,664	22,340	5,703	352,859	27,196	167,829	99,657
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681	1,681	1,681
Reconstr. grants (M)- mean	79	79	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29	29	29

Notes: Regressions in Panel A include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. Panel B shows instrumental variable regressions in which the reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. The dependent variables are the production of asparagus in 100kg (column 1), peaches in 100kg (column 2), pears in 100kg (column 3), walnuts in 100kg (column 4), potatoes in 100kg (column 5), olive oil in 100L (column 6), olives in 100kg (column 7), and tomatoes in 100kg (column 8). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Reconstruction Grants for New and Old Infrastructure

	Wheat & corn production	Wine production	Grape production	Agricultural workers	Agricultural firms	Tractors	Threshers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Re. grants NEW (M) x Post 1952	6,930.791***	773.503	942.903	-223.218*	441.360**	42.656***	-0.500
	(1,733.031)	(1,736.347)	(2,317.898)	(116.367)	(214.974)	(12.617)	(0.478)
Rec. grants OLD (M) x Post 1952	4,507.899*	-831.047	-820.206	88.386	52.414	7.403	-0.910
	(2,358.198)	(2,133.988)	(2,831.348)	(178.558)	(260.140)	(16.867)	(0.746)
Observations	2,244	2,341	2,341	516	222	2,218	1,998
R^2	0.951	0.892	0.892	0.951	0.781	0.915	0.866
Mean outcome	1,234,237	459,348	694,159	96,445	45,958	454	383
Reconstr. grants NEW (M)- mean	38	38	38	38	38	38	38
Reconstr. grants NEW (M)- std. dev.	27	27	27	27	27	27	27
Reconstr. grants OLD (M)- mean	41	41	41	41	41	41	41
Reconstr. grants OLD (M)- std. dev.	36	36	36	36	36	36	36

Notes: This table shows OLS regressions in which agricultural outcomes are regressed on the amount of reconstruction grants received by a province (in millions). Reconstruction grants are divided in two variables: grants for new projects (Rec. grants NEW) and grants for fixing preexisting infrastructure (Rec. grants OLD). The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of agricultural workers (column 5), the number of agricultural firms (column 6), the number of tractors (column 7), and the number of threshers (column 8). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Mediation Analysis on Shorter Commuting Distance

	Wheat & corn production (1)	Wine production (2)	Grape production (3)	Agricultural workers (4)	Peaches (5)	Pears (6)	Tractors (6)
Baseline treatment effect	71.220***	63.747*	79.573**	-5.801***	62.823**	55.429***	0.515**
	(25.453)	(33.246)	(39.480)	(1.681)	(27.289)	(11.883)	(0.208)
Non-mediated effect	30.070***	53.790***	67.983***	-2.819***	57.181***	54.546***	0.593***
	(8.214)	(10.342)	(12.398)	(0.904)	(6.201)	(8.248)	(0.052)
Share explained by shorter commuting distance	58%	16%	15%	51%	9%	2%	0%

Notes: This table follows the procedure outline by Acharya, Blackwell, and Sen (2016) to estimate how much of the main treatment effects are mediated by the change in the transportation network. First, we augment the baseline reduced-form specifications by including the average post-WWII change in commuting distance between the provincial capital and each municipality within a province interacted with a Post-1952 dummy. Then, we compute the "de-mediated" dependent variable by subtracting the predicted influence of the mediator on the dependent variable. Then, we re-estimate the main reduced-form specifications on the de-mediated dependent variable. The "Non-mediated treatment effect" is the coefficient of the tons of post-armistice Allied bombs interacted with Post 1952 from this last regression. Finally, we bootstrap this coefficient (100 reps) to obtain unbiased standard errors. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of agricultural workers (column 5), the number of agricultural firms (column 6), the number of tractors (column 7), and the number of threshers (column 8). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A10: Heterogeneous Effects by Mechanization Level

	Wheat & corn production		Wine production		Grape production		Pear production	
	Above median (1)	Below median (2)	Above median (3)	Below median (4)	Above median (5)	Below median (6)	Above median (7)	Below median (8)
				Panel A: Reduced form				
Tons of bombs x Post 1952	105.259**	-12.539	65.982	44.540	89.758	28.079	68.854***	4.498
	(41.570)	(56.030)	(48.911)	(36.268)	(59.278)	(65.104)	(25.150)	(4.807)
Observations	1,082	1,046	1,118	1,099	1,118	1,099	1,120	1,120
R^2	0.957	0.958	0.916	0.923	0.923	0.903	0.630	0.788
				Panel B: IV				
Reconstr. grants (M) x Post 1952	13,967.878**	-1,761.329	8,738.238	6,029.275	11,886.864	3,800.964	9,119.227**	601.864
	(6,839.853)	(9,022.376)	(7,819.022)	(5,246.527)	(9,725.061)	(8,507.897)	(3,965.461)	(788.813)
Observations	1,082	1,046	1,118	1,099	1,118	1,099	1,120	1,120
R^2	0.957	0.957	0.893	0.922	0.902	0.903	0.596	0.785

Notes: This table shows heterogeneous effects on agricultural production based on the postwar increase in the provincial-level number of tractors. For each province, we compute the percentage increase in the number of tractors between 1939 and 1960. Then, we run separate regressions for provinces above and below the median increase. The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A11: P-values Adjusted for Multiple Hypothesis Tests

	Industrial firms (1)	Firms $\leq$ 10 employees (2)	Industrial workers (3)	Agricultural workers (4)	Wheat & corn production (5)	Tractors (6)
Tons of bombs x Post 1952	0.054**	0.041*	0.640***	-5.801***	71.220***	0.515**
	(0.025)	(0.022)	(0.202)	(1.681)	(25.453)	(0.208)
P-value (B-H)	0.076	0.076	0.009	0.002	0.026	0.046
P-value (S-H)	0.074	0.075	0.009	0.002	0.026	0.046
P-value (W-Y)	0.160	0.160	0.080	0.040	0.060	0.080
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.952	0.949	0.908
Tons of bombs - mean	1,486	1,486	1,486	1,486	1,486	1,486
Tons of bombs - std. dev.	2,063	2,063	2,063	2,063	2,063	2,063
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: This table computes adjusted p-values for multiple concurrent hypothesis tests using three different methodologies: Bonferroni-Holm, Sidak-Holm, and Westfall-Young ("Resampling-based Multiple Testing: Examples and Methods for p-value Adjustment." by Westfall and Young (1993)). The table uses the user-written Stata command `wyoung` ("What Do Workplace Wellness Programs Do? Evidence From the Illinois Workplace Wellness Study." by Jones, Molitor, and Reif (2019)). All regressions include province fixed effects, region-year fixed effects, pre-war characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The first three columns also include industry fixed effects. The dependent variables are the number of firms in an industry, province, and year (column 1), the number of firms with less than 10 employees (column 2), the number of industrial workers (column 3), the number of agricultural workers (column 4), production of wheat and corn in 100kg (column 5), and the number of tractors (column 6). Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Political Outcomes

	Strikes	Share of firms with strikes	Share of votes for DC	Share of votes for PCI
	(1)	(2)	(3)	(4)
		Panel A: Reduced form		
Tons of bombs x Post 1952	0.0001	-0.0004	0.0037***	0.0002
	(0.0001)	(0.0006)	(0.0010)	(0.0003)
Observations	1,850	666	432	420
R^2	0.4834	0.3128	0.8344	0.9813
		Panel B: IV		
Reconstr. grants (M) x Post 1952	0.0094	-0.0447	0.4078***	0.0331
	(0.0118)	(0.0615)	(0.1227)	(0.0382)
Observations	1,850	666	432	420
R^2	0.4825	0.3090	0.7593	0.9808
F-statistic	28.08	26.66	22.61	15.05
Mean outcome	5.5	86	44	31
Tons of IC bombs - mean	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681
Reconstr. grants (M)- mean	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29

Notes: Regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. Panel B shows instrumental-variable regressions in which the reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. The dependent variables are the number of strikes per province and year (column 1), the share of firms affected by strikes per province and year (column 2), the share of votes for the Christian Democratic party per province and national election (column 3), the share of votes for the Italian Communist Party per province and national election (column 4). The data on strikes (1946-1970) come from Archivio Storico dello Stato (Rome-Italy), fondo CIR, busta 39. Data on national elections in 1946, 1948, 1953, 1958, 1963, 1968, 1972 come from the historical archive of the Ministry of the Interior. It is available online at https://elezionistorico.interno.gov.it/. The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A13: Controls for Distance from Austrian Border

	Industrial firms (1)	Firms ≤ 10 employees (2)	Industrial workers (3)	Agricultural workers (4)	Wheat & corn production (5)	Tractors (6)
Panel A: Distance ≥ 500 km from Brenner Pass						
Tons of bombs x Post 1952	0.098***	0.080***	0.968***	-11.545***	32.271	0.358**
	(0.023)	(0.020)	(0.257)	(2.976)	(37.823)	(0.142)
Observations	2,727	2,725	2,725	244	1,034	1,050
Tons of bombs - mean	642	642	642	642	642	642
Tons of bombs - std. dev.	1,381	1,381	1,381	1,381	1,381	1,381
Panel B: Controls for provinces with Brenner Highway						
Tons of bombs x Post 1952	0.051*	0.039*	0.622***	-5.775***	68.483***	0.486***
	(0.026)	(0.022)	(0.205)	(1.702)	(21.945)	(0.159)
Observations	5,454	5,443	5,443	516	2,244	2,218
Tons of bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681
Panel C: Controls for provinces with any highway leading abroad						
Tons of bombs x Post 1952	0.051*	0.040*	0.614***	-5.791***	68.983***	0.492***
	(0.026)	(0.022)	(0.205)	(1.716)	(21.880)	(0.160)
Observations	5,454	5,443	5,443	516	2,244	2,218
Tons of bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681
Panel D: Controls for length of roads in 1938						
Tons of bombs x Post 1952	0.036	0.027	0.528***	-3.530***	53.559*	0.372*
	(0.022)	(0.020)	(0.186)	(1.329)	(28.818)	(0.222)
Observations	5,454	5,443	5,443	516	2,244	2,218
Tons of bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: Panel A includes only provinces that are at least 500 km away from the Brenner Pass (on Italian border with Austria). Panel B includes a dummy that identifies provinces touched by the Brenner Highway, the most direct road to the Austrian border, interacted with trends up to the third order. These provinces are: Modena, Reggio Emilia, Mantova, Verona, Trento, Bolzano. In addition to controlling for the Brenner Highway, Panel C includes a dummy that identifies provinces with any highway leading abroad interacted with trends up to the third order. The highways are: A34, A23, A5, A9, A10, and A32. The provinces are: Gorizia, Udine, Torino, Aosta, Milano, Varese, Como, Genova, Savona, Imperia. Panel D includes the province-level length of roads in 1938 interacted with trends up to the third order. All regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The first three columns also include industry fixed effects. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A14: Controls for Geography

	Industrial firms (1)	Firms ≤ 10 employees (2)	Industrial workers (3)	Agricultural workers (4)	Wheat & corn production (5)	Tractors (6)
Panel A: Trends correlated with geographical features (elevation, degree of urbanization)						
Tons of bombs x Post 1952	0.072***	0.058***	0.744***	-6.011***	66.952***	0.474**
	(0.023)	(0.020)	(0.188)	(1.741)	(24.371)	(0.195)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.393	0.358	0.479	0.954	0.950	0.912
Tons of bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681
Panel B: Trends correlated with fertility of soil						
Tons of bombs x Post 1952	0.061**	0.048**	0.686***	-6.428***	74.877***	0.525***
	(0.026)	(0.023)	(0.205)	(1.808)	(23.255)	(0.164)
Observations	5,454	5,443	5,443	516	2,215	2,188
R^2	0.391	0.357	0.477	0.956	0.952	0.916
Tons of bombs - mean	1045	1045	1045	1,045	1,045	1,045
Tons of bombs - std. dev.	1681	1681	1681	1,681	1,681	1,681
Panel C: Trends correlated with latitude, longitude, distance from Brenner Pass						
Tons of bombs x Post 1952	0.040*	0.030	0.584***	-5.414**	66.544***	0.468**
	(0.024)	(0.020)	(0.210)	(2.133)	(19.503)	(0.182)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.392	0.357	0.478	0.955	0.960	0.936
Tons of bombs - mean	1045	1045	1045	1,045	1,045	1,045
Tons of bombs - std. dev.	1681	1681	1681	1,681	1,681	1,681
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: Panel A includes geographical characteristics (average elevation, share of rural municipalities) interacted with a trend up to the third order. Panel B includes data on the fertility of soil interacted with a trend up to the third order. These variables measures the province-level average fertility of soil (kg/ha) for the production of wheat, maize, tomato, and potato. These variables are measured in 1961 (first year available) by the Food and Agriculture Organization (FAO) through its project "Global Agro-Ecological Zones." More information is available online at http://www.fao.org/nr/gaez/about-data-portal/agricultural-suitability-and-potential-yields/en/. Panel C includes latitude and longitude of the centroid of each province, their squares, and the distance of the centroid from the Brenner Pass, all interacted with a trend up to the third order. All regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The first three columns also include industry fixed effects. The dependent variables are the number of firms in an industry, province, and year (column 1), the number of firms with less than 10 employees (column 2), the number of industrial workers (column 3), the number of agricultural workers (column 4), production of wheat and corn in 100kg (column 5), and the number of tractors (column 6). Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A15: Alternative Samples

	Industrial firms	Firms $\leq$ 10 employees	Industrial workers	Agricultural workers	Wheat & corn production	Tractors
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: All Italian Provinces			
Tons of bombs x Post 1952	0.056**	0.044**	0.613***	-5.224***	60.992**	0.492**
	(0.025)	(0.022)	(0.194)	(1.588)	(24.933)	(0.201)
Observations	6,246	6,235	6,235	593	2,598	2,578
R^2	0.389	0.355	0.476	0.950	0.937	0.909
Tons of bombs - mean	907	907	907	907	907	907
Tons of bombs - std. dev.	1,604	1,604	1,604	1,604	1,604	1,604
			Panel B: No Southern Provinces			
Tons of bombs x Post 1952	0.042*	0.031	0.571***	-6.003***	66.656***	0.484**
	(0.024)	(0.021)	(0.193)	(1.817)	(24.813)	(0.209)
Observations	4,302	4,291	4,291	404	1,780	1,738
R^2	0.390	0.354	0.479	0.939	0.957	0.905
Tons of bombs - mean	1,305	1,305	1,305	1,305	1,305	1,305
Tons of bombs - std. dev.	1,825	1,825	1,825	1,825	1,825	1,825
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: Panel A includes all Italian provinces . Panel B drops provinces from Sardegna, Sicilia (like the baseline sample), Abruzzo, Basilicata, Campania, Calabria, Puglia, and Molise. All regressions include province fixed effects, region-year fixed effects, pre-war characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The first three columns also include industry fixed effects. The dependent variables are the number of firms in an industry, province, and year (column 1), the number of firms with less than 10 employees (column 2), the number of industrial workers (column 3), the number of agricultural workers (column 4), production of wheat and corn in 100kg (column 5), and the number of tractors (column 6). Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A16: Spatial HAC Standard Errors

	Industrial firms	Firms $\leq$ 10 employees	Industrial workers	Agricultural workers	Wheat & corn production	Tractors
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Baseline with standard errors clustered at the province level						
Tons of bombs x Post 1952	0.054**	0.041*	0.640***	-5.801***	71.220***	0.515**
	(0.025)	(0.022)	(0.202)	(1.681)	(25.453)	(0.208)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.952	0.949	0.908
Panel B: Spatial HAC standard errors						
Tons of bombs x Post 1952	0.054**	0.041*	0.640***	-5.801***	71.220***	0.515***
	(0.025)	(0.022)	(0.197)	(1.474)	(16.951)	(0.140)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.954	0.949	0.908
Tons of bombs - mean	1045	1045	1045	1,045	1,045	1,045
Tons of bombs - std. dev.	1681	1681	1681	1,681	1,681	1,681
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: Panel A shows the baseline results with standard errors clustered at the province level. Panel B shows estimates with spatial HAC standard errors (Conley, 1999). Spatial HAC standard errors correct for spatial correlation among provinces that are within 5,000km of each other. All regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The first three columns also include industry fixed effects. The dependent variables are the number of firms in an industry, province, and year (column 1), the number of firms with less than 10 employees (column 2), the number of industrial workers (column 3), the number of agricultural workers (column 4), production of wheat and corn in 100kg (column 5), and the number of tractors (column 6). Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A17: Controls for WWII, the Marshall Plan, and Other Public Spending

	Industrial firms	Firms ≤ 10 employees	Industrial workers	Wheat & corn production	Agricultural workers	Tractors
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Controls for tons of bombs before the Armistice of Cassibile						
Tons of bombs x Post 1952	0.057**	0.044*	0.687***	57.957**	-5.252***	0.534***
	(0.026)	(0.022)	(0.201)	(25.039)	(1.500)	(0.176)
Observations	5,526	5,515	5,515	2,270	523	2,245
R^2	0.391	0.356	0.477	0.952	0.954	0.909
Panel B: Controls for other MP grants						
Tons of bombs x Post 1952	0.059**	0.045**	0.712***	77.583***	-7.199***	0.667***
	(0.025)	(0.022)	(0.202)	(25.955)	(2.165)	(0.201)
Other MP grants (M) x Post 1952	-0.417	-0.384	0.542	-437.041	-24.516	1.176
	(0.387)	(0.327)	(3.189)	(506.145)	(38.092)	(3.090)
Observations	5,526	5,515	5,515	2,270	523	2,245
R^2	0.391	0.356	0.477	0.949	0.949	0.902
Panel C: Controls for other MP grants and war-related deaths						
Tons of bombs x Post 1952	0.046*	0.034	0.634***	63.278**	-5.820***	0.508**
	(0.024)	(0.021)	(0.210)	(26.683)	(1.788)	(0.215)
Other MP grants (M) x Post 1952	-0.629	-0.571	-0.500	-630.564	-1.402	-0.502
	(0.410)	(0.347)	(3.395)	(491.164)	(37.390)	(3.003)
Observations	5,454	5,443	5,443	2,244	516	2,218
R^2	0.391	0.356	0.477	0.949	0.952	0.908
Panel D: Controls for investments in the transportation network by the Italian government						
Tons of bombs x Post 1952	0.026	0.020	0.480***	68.584**	-2.852**	0.479**
	(0.021)	(0.018)	(0.173)	(28.420)	(1.329)	(0.208)
Observations	5,526	5,515	5,515	2,270	523	2,245
R^2	0.392	0.357	0.478	0.951	0.961	0.911
Panel E: Controls for infrastructural investments by the Italian government						
Tons of bombs x Post 1952	0.030	0.022	0.502***	65.854**	-3.470**	0.463**
	(0.021)	(0.018)	(0.172)	(27.111)	(1.351)	(0.192)
Observations	5,526	5,515	5,515	2,270	523	2,245
R^2	0.392	0.357	0.478	0.950	0.958	0.909
Mean outcome	704	667	3,969	1,234,237	96,445	454
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681

Notes: Regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order. In addition, panel A includes the tons of bombs dropped in each province before the armistice interacted with a trend up to the third order; panel B includes the amount of grants (not for reconstruction of public infrastructures) assigned through the Marshall Plan interacted with a dummy equal to 1 starting from 1952; panel C includes the amount of grants (not for reconstruction of public infrastructures) assigned through the Marshall Plan interacted with a dummy equal to 1 starting from 1952, as well as the share of war-related deaths interacted with a trend up to the third order; panel D includes the amount of investments in the transportation network from the Italian government (separately for the periods 1946-1952 and 1953-1970) interacted with a trend up to the third order; panel E includes all infrastructural investments from the Italian government (separately for the periods 1946-1952 and 1953-1970) interacted with a trend up to the third order. The dependent variables are the amount of firms active in each province, industry, and year (column 1), the number of industrial workers (column 2), the number of firms with less than 10 workers (column 3), the production of wheat and corn in each province and year (column 4), the number of agricultural workers (column 5), and the number of tractors (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A18: Sobel-Goodman Mediation Test

	Industrial firms (1)	Firms ≤ 10 employees (2)	Industrial workers (3)	Wheat & corn production (4)	Agricultural workers (5)	Tractors (6)
Panel A: Controls for other MP grants						
Tons of bombs x Post 1952	0.063	0.075	0.007	0.051	0.035	0.018
Panel B: Controls for other MP grants and war-related deaths						
Tons of bombs x Post 1952	0.147	0.175	0.009	0.112	0.003	0.012

Notes: This table shows the results of Sobel-Goodman mediation tests. Each number represents the share of the effect of "Tons of IC bombs x Post 1952" on the dependent variable that is mediated by "Other MP grants (M) x Post 1952" (the amount of ERP grants not destined to infrastructure reconstruction). Regressions include province fixed effects, region-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) and war-related deaths (panel B only) interacted with a trend up to the third order. The dependent variables are the amount of firms active in each province, industry, and year (column 1), the number of industrial workers (column 2), the number of firms with less than 10 workers (column 3), the production of wheat and corn in each province and year (column 4), the number of agricultural workers (column 5), and the number of tractors (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign.

Table A19: Alternative Specifications of Bombings

	Industrial firms	Firms ≤ 10 employees	Industrial workers	Agricultural workers	Wheat & corn production	Tractors
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Drop provinces with 0 bombings						
Tons of bombs x Post 1952	0.067***	0.052**	0.728***	-6.763***	77.276***	0.438*
	(0.024)	(0.021)	(0.210)	(2.227)	(28.548)	(0.231)
Observations	4,446	4,435	4,435	404	1,718	1,678
R^2	0.392	0.357	0.481	0.938	0.956	0.906
Tons of bombs - mean	1,270	1,270	1,270	1,270	1,270	1,270
Tons of bombs - std. dev.	1,776	1,776	1,776	1,776	1,776	1,776
Panel B: Drop provinces with 0 bombings or more than 7,000 tons of bombs						
Tons of bombs x Post 1952	0.064	0.052	0.742**	-8.485*	108.681**	0.816**
	(0.048)	(0.041)	(0.342)	(4.384)	(46.043)	(0.331)
Observations	4,302	4,291	4,291	390	1,658	1,618
R^2	0.397	0.361	0.484	0.936	0.956	0.903
Tons of bombs - mean	1,034	1,034	1,034	1,034	1,034	1,034
Tons of bombs - std. dev.	1,183	1,183	1,183	1,183	1,183	1,183
Panel C: IC bombings since the Armistice of Cassibile						
Tons of bombs x Post 1952	0.058**	0.046**	0.613***	-5.894***	61.318***	0.413**
	(0.022)	(0.019)	(0.165)	(1.441)	(22.852)	(0.168)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.953	0.949	0.907
Tons of bombs - mean	1,486	1,486	1,486	1,486	1,486	1,486
Tons of bombs - std. dev.	2,063	2,063	2,063	2,063	2,063	2,063
Panel D: More targets during the Italian Campaign						
Tons of bombs x Post 1952	0.042**	0.034**	0.371***	-4.798***	60.789***	0.444***
	(0.019)	(0.016)	(0.116)	(1.140)	(17.271)	(0.108)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.957	0.951	0.914
Tons of bombs - mean	2,490	2,490	2,490	2,490	2,490	2,490
Tons of bombs - std. dev.	3,074	3,074	3,074	3,074	3,074	3,074
Mean outcome	704	667	3,969	96,445	1,234,237	454
Source	Decennial census	Decennial census	Decennial census	Yearly statistics	Yearly statistics	Yearly statistics

Notes: In Panel A, the sample drops provinces with 0 Allied bombings. In Panel B, the sample does not include provinces with 0 bombings and with more than 7,000 tons of bombs. In Panel C, the treatment variable measures the amount of explosives related to the Italian Campaign between the signing of the Armistice of Cassible (on September 3, 1943 instead of March 1944) and the end of the war. In Panel D, the treatment variable measures the amount of explosives used during the Italian Campaign against a longer list of targets: direct cooperation with ground forces; troop concentrations; radar installations; gun emplacements; weapon launching sites; tactical targets; supply dumps; tracks and marshaling yards; moving trains; highways and vehicles; transportation facilities; tunnels and bridges; waterways; and airdromes. The other variables included in the regression are described in Table 6 and Table 7. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A20: The Correlation of Different Measures of Bombings with War Damages

	Reconstruction grants (1)	Reconstruction grants (2)	Reconstruction grants (3)	War damages (4)	War damages (5)	War damages (6)
Tons of bombs	10,109***			5,232***		
	(1,740)			(910)		
Tons of bombs per km^2		24,158,909***			12,339,403***	
		(6,515,393)			(3,358,614)	
Tons of bombs per 1,000 prewar residents			3,749,492***			1,891,232***
			(1,061,327)			(527,386)
Observations	5,454	5,443	5,443	516	2,244	2,218
R^2	0.391	0.356	0.477	0.953	0.949	0.907
Dep. var.—mean	78,745,789	78,745,789	78,745,789	42,127,685	42,127,685	42,127,685
Bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681
Effect (1σ of bombs)	16,989,283	13,287,400	12,410,818	8,793,272	6,786,671	6,259,979

Notes: Tons of bombs is the total tons of Allied bombs dropped in each province during the Italian Campaign. Tons of bombs per km^2 is the ratio between total tons of bombs and the area of a province. Tons of bombs per 1,000 prewar residents is the ratio between total tons of bombs and the provincial population (in 1,000 of inhabitants) in 1937. Data on funding from the Marshall Plan come from *"Missione Americana ERP in Italia", "Mutual Security Agency"* bulletins, and the historical archive of the *Istituto Mobiliare Italiano.* Data on damages to public infrastructure (transportation system, sanitation system, and public buildings) come from *"Italy: Country Study"* by the ECA. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

B Anecdotal Evidence on Updated Infrastructure

This section discusses two more anecdotes in addition to the one included in the main text.

First, the Marshall Plan financed the reconstruction and expansion of the railroad connecting Bologna and Padova, two major cities in northern Italy. The project, started in 1950 and completed in 1954, led to an increase in cherry, apricots, and peaches production. This effect was likely due to the fact that the updated railroad (not just its reconstruction, but the addition of a second track to address increased demand for transportation) allowed the fruit farmers near Bologna to sell their products to local markets outside their region. This example is discussed in the 2004 book "Il piano Marshall in Emilia Romagna e Lombardia" by Simona Spertini.

Second, the Marshall Plan financed the reconstruction and expansion of the road between Rezzato and Vicenza in Veneto. The construction of this road allowed local farmers to sell their products on many more markets, not just their local ones. This example is included in the 1991 essay "Un sondaggio periferico: Gli americani a Vicenza" by Maurizio Caiaffa.

Next, we include the articles used as a reference for the anecdote in the main text The first article was published by La Stampa on November 15, 1949 on page 4, and is cited in Section 4.2 of the draft (emphasis added in the relevant part of the article).

> **Un rapporto ufficiale dell'ERP sulla nostra regione. Prestiti per diciotto miliardi concessi alle industrie piemontesi. Si tratta di una cifra pari a circa un quarto di quella totale per l'Italia—Altri due miliardi e 127 milioni di lire saranno impiegati per opere delle FF. SS.**
>
> A quasi un anno a mezzo di distanza dalla entrata in funzione del Piano Marshall, è interessante vedere quale ne è stata l'applicazione in Piemonte, specialmente nei confronti delle altre regioni italiane. Come è noto, l'European Recovery Plan contempla sia grants (offerti gratuitamente dall'America) sia loans (prestiti in dollari a lunga scadenza, alle industrie). E' facile osservare, anche dopo una prima superficiale scorsa dei dati statistici, come il Piemonte abbia usufruito in misura molto modesta (nel confronti di altre regioni, s'intende) dei grants e come invece la sua industria si sia resa immediatamente conto dei vantaggi offerti dai loans. Tipica voce tra grants, quella dei medicinali. Dati aggiornati che citiamo da una relazione della divisione informazioni dell'E.C.A. dimostrano che di 2.306.000 milioni di unità di penicillina donate all'Italia, solo 62.096 milioni sono state distribuite in Piemonte; di 4.032.70 grammi di streptomicina, 207.936; di 6.734.000 centimetri cubi d'insulina, solo 32.500; di 2.060.000 oc di estratto di fegato, infine, solo 10.000 sono toccate alla nostra regione. Ben diversa la distribuzione della seconda voce: prestiti (loans) E.R.P. a lunga scadenza e ed un modesto tasso di interesse. Al 15 ottobre u. s., infatti, era stata approvata la concessione all'industria italiana per 109.103.274 milioni di dollari: di tale cifra, 29.276.039 dollari—più di un quarto—sono stati assegnati a ditte piemontesi e cosi ripartiti: Industria tessile. Maglioni e Tedeschi: dollari 750.000; Robassonero: 350.000; Cotonificio Val di Susa: 180.000; Manifattura Pastore: 55.000; Manifatture Mosca: 14.000; Amia 8800. Industria Meccanica. Officine S. Andrea: 880.000; Off. Sa vigliano; 080.000; Fiat 12.820.658; Fiat 1.800.000; Lancia e C. 800.000; Gavini Vittorio 65.000; Conterò O. e C: 60.000; Fratelli Zerboni e C: 600.000. Industria Elettromeccanica. Weetlnghouse: 170.000; ìnóet: 220.000; Carburatori Zenith: 36 mila; P. Pogliano 20.000; Utensileria Speciale e Attresz.: 26 mila; Bematsegmentl.: 11.000. Industria Siderurgica. Officine Metallurgiche Pepino G.S.A. 85.000; Fiat 4.159.000; Cogne 1.034.000; Società Leghe Porose: 82.000. Industria Chimica. Soc. Italiana Gas: 900,000. Industria Cartaria. Giacomo Bosso: 206.000; Cartiera Burgo: 1.660.000. Industria Editoriale. Stamperia Artist Naz.: 12.000; Linotipia Bearzatto: 17.000; Ist. Grafico Bertello: 100.000; Istit. Geograf. De Agostini: 125.000. Telecomunicazioni. T.I.M.O.: 70.000; R.A.I.: 826.581. Industria Elettrica. Ceat: 250.000. Industria Gomma. Ceat: 420 mila. Industrie Varie. Pennellinolo Piemontese: 11.000; Imprese Coetruz. Borini: 26.000. Con i soldi forniti

gratuitamente all'Italia dall'E.R.P. (grants), vengono, come noto, alimentati i fondi per la ricostruzione, tra cui 127 miliardi per la ricostruzione delle ferrovie dello Stato. Di quest'ultima somma, 875 milioni di lire sono stati stanziati per il Piemonte per il 1950; altri 2 miliardi e 127.200.000, lo saranno nel corso del 1951. ***Tra i finanziamenti approvati per il primo trimestre del 1950 figura la ricostruzione del Binario Carmagnola-Fossano (lire 923.300.000) con l'aggiunta di un secondo binario. Questa opera si figura indispensabile nel panorama piemontese. La percorrenza della linea ferroviaria Torino-Savona, fortemente danneggiata dai bombardamenti della Seconda Guerra Mondiale, specialmente nel tratto indicato, richiede fino a sette ore, a fronte di appena 259km percorsi.*** Altre finanziamenti già stanziati includono: ponte sul fiume Tanaro a km. 89.292 della linea Torino-Genova (168.600.000); arcate di metallo del ponte su Roccia Braga a 91.531 km. della linea Torino-Milano (86.900 mila); ponte ferroviario sul Ticino a 33.272 km. della linea Milano-Vigevano (101200.000); pensilina passeggeri nella stazione di Alessandria (59.600.000); tettoia riparo veicoli per l'Officina Materiale Rotabile e rotaie per due gru a ponte a Torino (47.200.000).

Here, there is its English translation (emphasis added in the relevant part of the article).

An official report of ERP in our region. Loans for eighteen billion liras given to Piedmont firms. It is one fourth of the total for Italy. Two additional billion and 127 million liras will be used for projects of the State Railroads

Almost one year and a half after the beginning of the Marshall Plan, it is interesting to see its implementation in Piedmont, especially in comparison with the other Italian regions. The European Recovery Plan includes both grants (given by the US with no repayment needed) and loans (long-term loans in dollars given to industries). It is easy to observe, even after a quick look at the statistical data, that Piedmont received few grants (compared to other reasons) while its industry had immediately taken full advantage of loans. The most common form of grant was represented by the delivery of medicines. Updated data that we cite from a report by the information division of E.C.A. show that out of 2.306.000 million units of penicillin donated to Italy, only 62.096 million have been distributed in Piedmont; out of 4.032.700 grams of steptomicine, 207.936; out of 6.734.000 cm3 of insulin, only 32,500; out of 2,060,000 of liver extract only 10,000 have been given to our region. The distribution of long-term E.R.P. loans at low interest rates looks very different. As of date, 109.103.274 million dollars have been loaned to Italian firms: Of this amount, 29.276.039 dollars–more than one fourth–have been assigned to Piedmont and distributed as follows: Textile Industry. Maglioni e Tedeschi: dollars 750.000; Robassonero: 350.000; Cotonificio Val di Susa: 180.000; Manifattura Pastore: 55.000; Manifatture Mosca: 14.000; Amia 8800. Mechanic Indsutry. Officine S. Andrea: 880.000; Off. Sa vigliano; 080.000; Fiat 12.820.658; Fiat 1.800.000; Lancia e C. 800.000; Gavini Vittorio 65.000; Conterò O. e C: 60.000; Fratelli Zerboni e C: 600.000. Electromagnetic Industry. Weetlnghouse: 170.000; ìnóet: 220.000; Carburatori Zenith: 36 mila; P. Pogliano 20.000; Utensileria Speciale e Attresz.: 26 mila; Bematsegmentl.: 11.000. Iron Industry. Officine Metallurgiche Pepino G.S.A. 85.000; Fiat 4.159.000; Cogne 1.034.000; Società Leghe Porose: 82.000. Chemical Industry. Soc. Italiana Gas: 900,000. Industria Cartaria. Giacomo Bosso: 206.000; Cartiera Burgo: 1.660.000. Newspaper Industry. Stamperia Artist Naz.: 12.000; Linotipia Bearzatto: 17.000; Ist. Grafico Bertello: 100.000; Istit. Geograf. De Agostini: 125.000. Telecommunications. T.I.M.O.: 70.000; R.A.I.: 826.581. Electric Industry. Ceat: 250.000. Rubber Industry. Ceat: 420 mila. Other Industries. Pennellinolo Piemontese: 11.000; Imprese Coetruz. Borini: 26.000. The grants are often used for reconstruction, including 127 billion for the State Railroad reconstruction. For the latter, 875 million liras have been assigned to Piedmont in 1950; other 2 billion and 127.200.000 will be assigned in 1951. ***Among the reconstruction projects approved for the first quarter of 1950, there is the reconstruction of the railway Carmagnola-Fossano (lire 923.300.000) with the addition of a second track. This project is crucial for Piedmont. Traveling along the railroad line Torino-Savona, heavily bombed during WWII, especially between Carmagnola and Fossano, takes up to 7 hours, for***

a mere 259km. Other projects already approved include: bridge on river Tanaro at a km. 89.292 from the line Torino-Genova (168.600.000); steel arcades on the bridge on Roccia Braga at 91.531 km. from the line Torino-Milano (86.900.000); railroad bridge on River Ticino a 33.272 km. from the line Milano - Vigevano (101200.000); passenger platform in the station of Alessandria (59.600.000); repair roof for vehicles for the Railroad Material Office and rails for two cranes in Torino (47.200.000).

The second article was published by La Stampa on October 20, 1957 on page 5, and is cited in Section 4.2 of the draft (emphasis added in the relevant part of the article).

Note di agricoltura. Mentre si vendemmia migliora il prezzo del vino. L'imposta di consumo deve andare a favore dei produttori e dei consumatori

La vendemmia delle uve dolcetto e Moscato, iniziatasi ai primi di ottobre, con temperature piuttosto fredde le quali hanno ostacolato la fermentazione, è poi continuata con la barbera, la freisa ed attualmente il nebbiolo. Il tempo, mantenendosi sempre bello, ha facilitato la maturazione delle uve, sebbene quest'anno le gradazioni glucometriche siano stale piuttosto basse, circa 18 gradi per la barbera, pari a 10.8-11 gradi di alcool. I prezzi medi delle uve sono stati soddisfacenti e sono sempre andati aumentando dall'inizio della vendemmia. Nell'attesa di conoscere le medie comunali che saranno pubblicate a vendemmia ultimata, le quotazioni approssimative, di orientamento, sono state le seguenti: Dolcetto delle zone classiche da 650 a 700, Moscato da 720 a 800, Barbera d'Asti da 580 a 650 fino a 680 nel giorni scorsi; Freisa da 460 a 520; Nebbiolo da 700 a 850. I vini che si ricaveranno nella corrente annata risulteranno sani, armonici, serbevoli, con giusta proporzione nei vari elementi, però dotati di gradazioni alcooliche un po' deficitarie: manca sovente un grado di alcool che si potrebbe ottenere, se da noi non fosse vietato lo zuccheraggio, aggiungendo Kg. 1.60 di zucchero ogni ettolitro di mosto. Si ritiene che la produzione nazionale possa aggirarsi sui 50 milioni di ettolitri di vino. Nel complesso, quest'anno, si avrà una produzione di qualità soddisfacente. In certe regioni però, come ad esempio in Piemonte la produzione risulta superiore del 25-30 per cento nei confronti del 1956. ***In relazione all'attuale produzione vinicola è indubbio che quest'anno e cosí pure si ritiene che nel 1958 tutta la produzione vinicola verrà smerciata e saranno cosi superate quelle difficoltà che si sono riscontrate fino allo scorso anno. Il completamento della linea Carmagnola-Fossano e la costruzione del doppio binario finanziati dal Piano Marshall finalmente consente collegamenti rapidi ed efficienti con la Liguria e, quindi, con la Francia. E' auspicabile (ed i primi sintomi si sono già avuti in questi giorni), che anche presso i produttori il prezzo del vino prenda il dovuto «tono» e possa compensare il lavoro del viticoltore.*** Ecco l'andamento del prezzi dei vini all'ingrosso ed al minuto, prendendo come riferimento l'anno 1938 con il coefficiente uno. Nel 1950: 35 volte all'ingrosso e 45 al minuto; nel 1952: 35 contro 46; nel 1954: 54 contro 59; nel 1956: 46 contro 61; nel 1957, a maggio, 34 all'ingrosso contro 60 al minute. I viticoltori, le organizzazioni di categoria ed Governo, stanno lavorando per poter ridurre la tassazione vinicola. Il provvedimento più importante che dovrebbe essere deliberato dal Governo è quello dell'abolizione dell'imposta sul vino, il cui gettito annuo si aggira sui 35 miliardi di lire. E' necessario però prendere tutte le garanzie affinché tale riduzione del gravame su questa popolare bevanda vada a favore dei produttori e dei consumatori poiché se fosse altrimenti e per recuperare uguale somma si colpisse per altre vie l'agricoltura, converrebbe lasciare le cose come stanno.

Here, there is its English translation (emphasis added in the relevant part of the article).

Report on Agricultural Production. While Harvesting Grapes, Wine Price Rises. The consumption tax should benefit producers and consumers

Harvesting of Dolcetto e Moscato grapes, started at the beginning of October, with fairly cold temperatures which prevented fermentation, then continued to Barbera grapes, la Freisa

grapes, and these days Nebbiolo grapes. The weather, being always fine, has helped the grape maturation, despite this year the glucometric gradations are rather low, around 18 degrees for la Barbera, equivalent to 10.8-11 alcohol degrees. The average prices of grapes have been satisfactory and have been increasing since the beginning of the harvest. Waiting for the municipality average that will be published when the harvest is completed, the estimates have been the following: Dolcetto delle zone classiche from 650 to 700; Moscato from 720 to 800; Barbera d'Asti from 580 to 650 up to 680 in the last days; Freisa from 460 to 520; Nebbiolo from 700 to 850. The wines from this harvest will be good, harmonious, with the right proportion of the different elements, however with low alcoholic degrees: often, there is one degree missing, that could be obtained, if it wasn't forbidden, by adding 1.60kg of sugar for each hectoliter of must. It has been estimated that the national production could be around 50 million hectoliters of wine. Overall, this year there will be a satisfactory level of production. However, in some regions, such Piedmont, the production will be higher by 25-30 percent compared to 1956. ***Regarding this year production, it is clear that this year as well as in 1958 all the wine production will be sold, and the difficulties found until last year will be overcome. The completion of the line Carmagnola-Fossano and the construction of the second track financed by the E.R.P. now guarantee fast connection with Liguria, and therefore France. It is desirable now (and the first signs happened these days) for the price of wine to further increase in order to fully compensate the farmers' work.*** Here the prices of wine at wholesale and retail level, using as reference the year 1938 with coefficient 1. In 1950: 35 times wholesale and 45 retail; in1952: 35 against 46; in 1954: 54 against 59; in 1956: 46 against 61; in 1957, in May, 34 wholesale against 60 retail. The wine farmers, the unions and the Government, are working to reduce the wine taxes. The most important change that the Government should pass is to abolish the wine tax, whose revenues is 35 milliard lire. It is necessary to have all the guarantees so that the wine tax cut would benefit the producers and the consumers because if it was the case and to recover that sum there will be other type of taxes on agriculture, it would be better not to change anything.

C Roads and Railways: An Event-Study Analysis

Significant geographical variation exists in the year in which the first important construction projects were completed. The first five large public works in a province—each amounting to at least 5 percent of the total grants received by a province—were completed by 1953 in 37 provinces, by 1954 in 11 provinces, by 1955 in 34 provinces, by 1956 in 7 provinces, and by 1957 in 3 provinces (Figure C1, panel A). We exploit this distribution to draw a tighter correlation between the completion of public infrastructure in each province and economic development. We perform an event-study analysis to estimate how agricultural variables changed between provinces that suffered varying levels of tactical bombings after the execution of the first large construction projects:

$$\begin{aligned} y_{pk} &= \alpha_p + \beta_t + \gamma_{rk} + \delta \text{IC Bombs}_p \times \text{Post}_k \\ &\quad + \sum_{z=1}^{3} \text{trend}_t^z \times \text{Econ}_p + \sum_{z=1}^{3} \text{trend}_t^z \times \text{War}_p + \epsilon_{pk}, \end{aligned} \tag{3}$$

where the unit of observation is province p in event period k. The dependent variable y_{pk} is a measure of agricultural output.[43]

The dummy variable Post_k is equal to 1 for every period k after the completion of the first five large public works, each amounting to at least 5 percent of the total amount of ERP grants assigned to a province.[44]

As an additional test for the possible influence of omitted factors, we estimate placebo treatment effects starting from equation (3). Specifically, we restrict the sample to periods that preceded the completion of the first large public works in each province. We then create the variable Post_k by randomizing the first period in which this dummy takes value 1. The placebo treatment variable does not predict any significant change in the agricultural outcomes (Table C1 and Figure C2).

The event-study analysis indicates that agricultural outputs increased after the initial reconstruction of large public works (Table C2, panel A). A 1 σ difference in tons of explosives is associated with 9.6 million (se=3.2) additional kilograms of wheat and corn, 10 million (se=5.1) additional liters of wine, 11.7 million (se=6) additional kilograms of grapes, and 857 (se=282) additional tractors per province and year. In the IV specifications, the estimated effect of reconstruction grants is between 13 percent and 46 percent larger than the baseline (Table C3, panel A). The event studies also confirm that the reconstruction grants had no significant effect on crops (like olive oil production) concentrated in provinces that were not heavily affected by air strikes during the Italian Campaign, or on the adoption of obsolete

[43] We restrict the analysis to agricultural variables because industrial outputs are observed only in 1927, 1937 1951, 1961, 1971, 1981, 1991, and 2001. An event-study on industrial outcomes would lead to the same results described in Section 6.2. We also study the direct relationship between agricultural outputs and reconstruction grants by estimating the following IV specification: $y_{pk} = \alpha_p + \beta_t + \gamma_{rk} + \delta \text{Reconstruction grants}_p \times \text{Post}_k + \sum_{z=1}^{3} \text{trend}_t^z \times \text{Econ}_p + \sum_{z=1}^{3} \text{trend}_t^z \times \text{War}_p + \epsilon_{pk}$. We instrument the amount of reconstruction grants in province p with the amount of explosives dropped by Allied forces in the same province during the Italian Campaign.

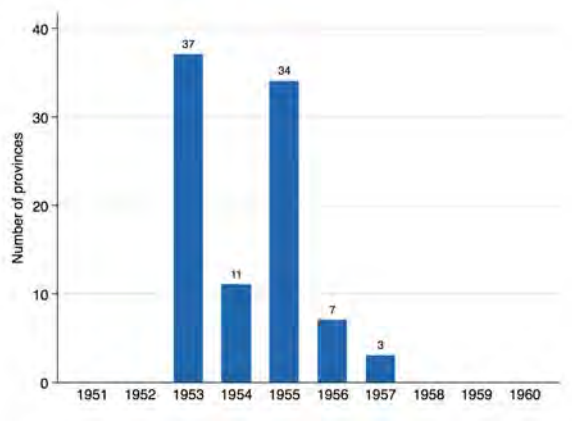
[44] All other variables have been introduced in the previous analysis. The results are robust if Post_k equals 1 after the completion of the first project amounting to at least 5 percent of the total ERP budget (Table C4).

tools such as manual threshers.

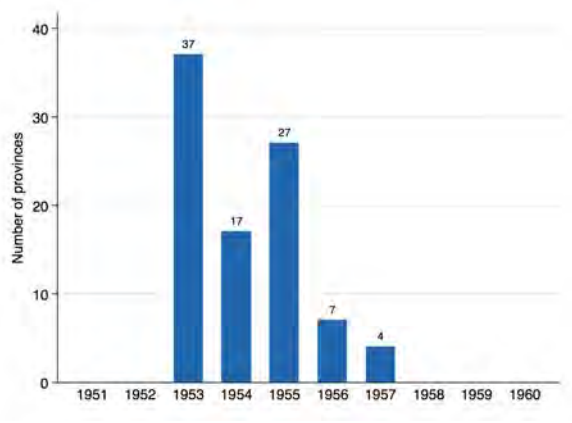
The first large road and railway projects had a different completion year in 17 provinces (18 percent). We use this variation to explore whether different types of infrastructure have varying effects on economic outcomes. On average, roads are associated with larger increases in economic outcomes. This finding is consistent with the fact that the Italian government favored the modernization of the road network at the expense of rail transport (Figure A4, panel C). In the case of grape production, for example, a 1 σ difference in tons of explosives is associated with 13.2 million (se=6.3) additional kilograms per province and year after the completion of the first five large roads (Table C2, panel B, column 3), but only 11.7 million (se=5.9) additional kilograms after the completion of the first five large railways (Table C2, panel C, column 3). The estimated effects for other variables are between 2 percent and 11 percent larger when Post_k flags the completion of the first five large roads.[45]

[45] Difference-in-differences estimates for single event periods show how most agricultural outputs increased only after the completion of the first public works (between 1953 and 1957), instead of immediately after receiving the ERP grants (between 1949 and 1952) (Figure C3). This trend is especially clear for the completion of the first roads.

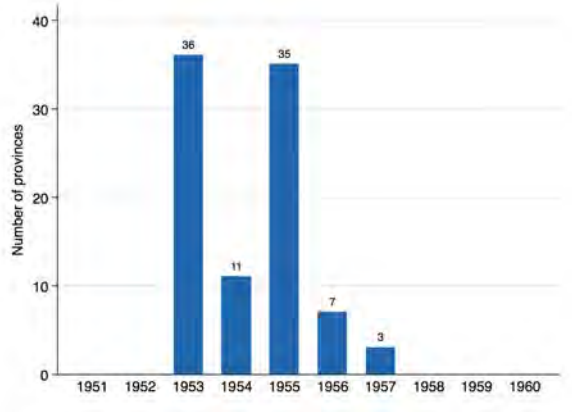
Figure C1: Year of Completion of Large Infrastructure Projects



A. Year of completion top five projects



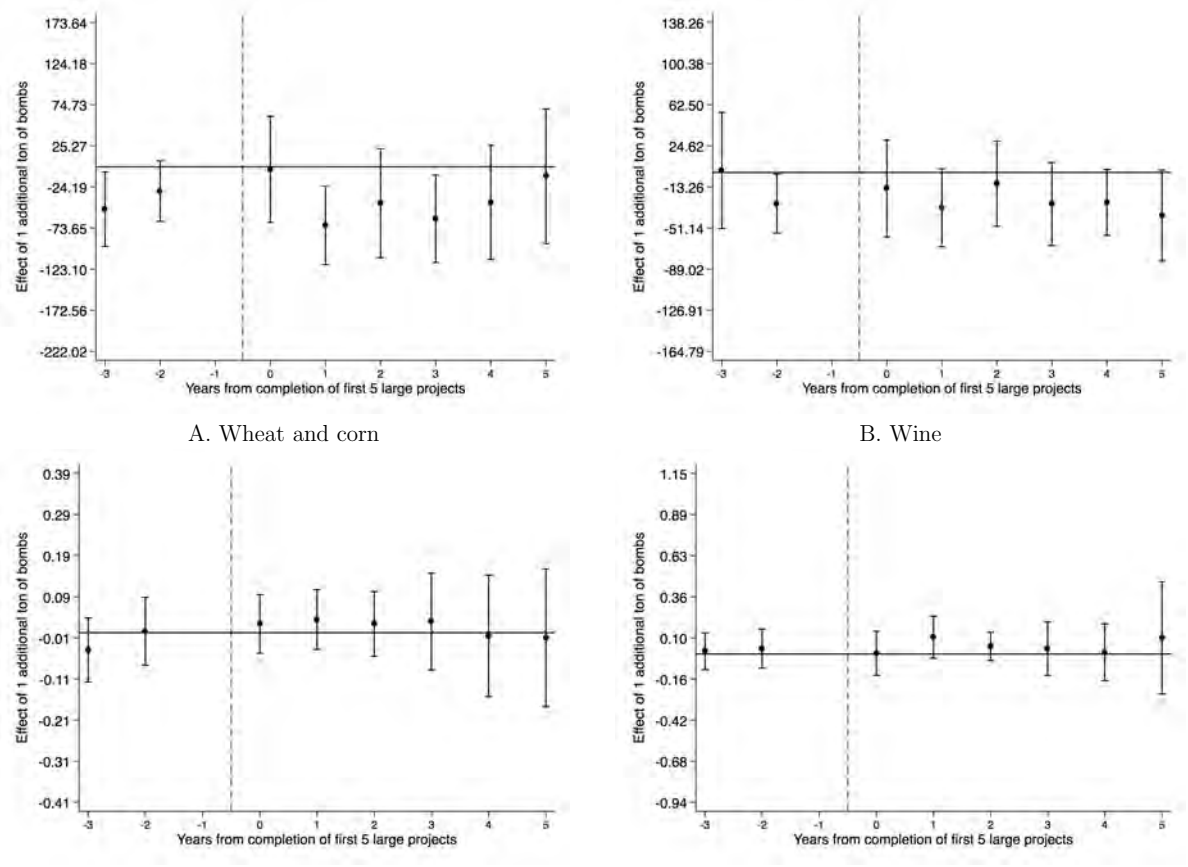
B. Year of completion top five roads



C. Year of completion top five railways

Notes: This graph shows the distribution of the completion year of the first five large infrastructure projects funded by E.R.P aid across the 92 Italian provinces. Panel A shows the completion year of the first 5 projects, each amounting to at least 5 percent of total funds assigned to a province. Panel B shows the completion year of the first five roads, each amounting to at least five percent of total funds assigned to a province. Panel A shows the completion year of the first five railways, each amounting to at least five percent of total funds assigned to a province.
Source: *"Missione Americana ERP in Italia," "Mutual Security Agency"* bulletins, and historical archive of the *Istituto Mobiliare Italiano.*

Figure C2: Completion of Large Infrastructure Projects, Placebo Treatments



A. Wheat and corn

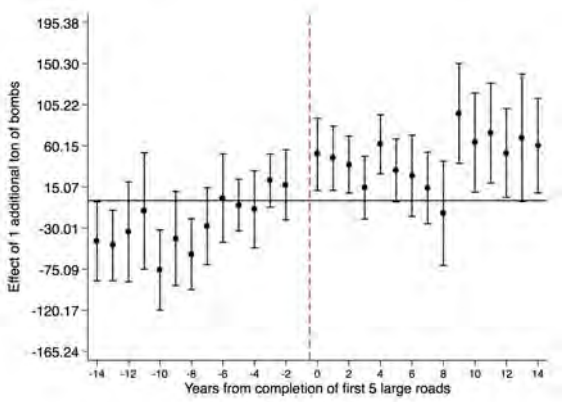
B. Wine

C. Tractors

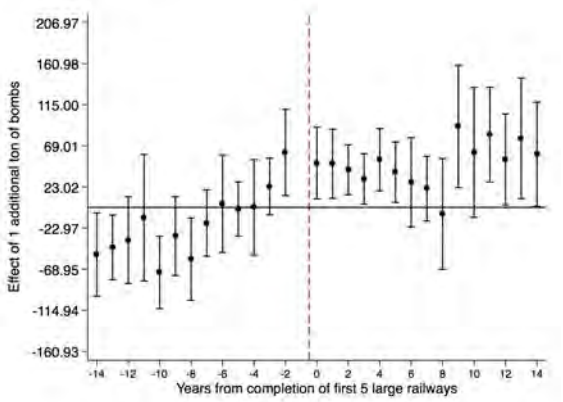
D. All Machines

Notes: These regressions are placebo-event studies. The estimating sample includes only periods before the actual completion of large infrastructure project. In each province, period 0 is chosen randomly among the pre-treatment periods. Regressions also include province fixed effects, region-event period fixed effects and calendar year fixed effects, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, horsepower, employment rate, share of industrial workers, and share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the production of wheat and corn in each province, and year (100kg, panel A), the production of wine (100L, panel B), the number of tractors (panel C), and the number of all motorized agricultural machines (panel D). Sources: Annuario di Statistica Agraria, Censimento Generale della Popolazione, Istituto Nazionale di Statistica. USAF Theater History of Operations Reports (THOR) Database, available at www.afri.au.af.mil/thor.

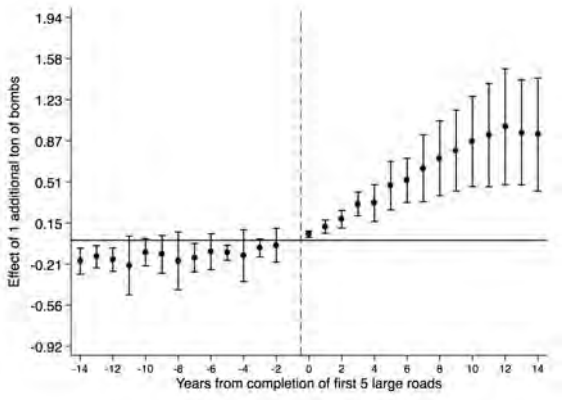
Figure C3: Completion of Large Infrastructure Projects



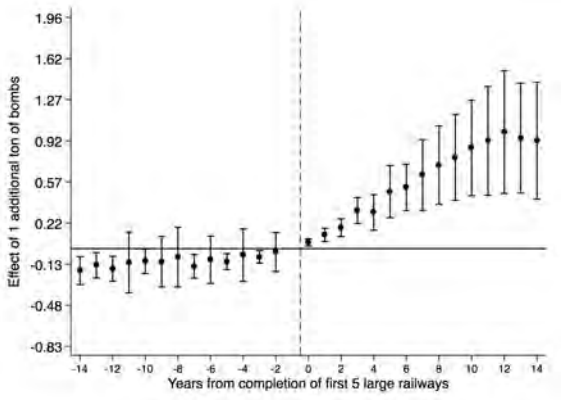
A. Wheat and corn - top five roads



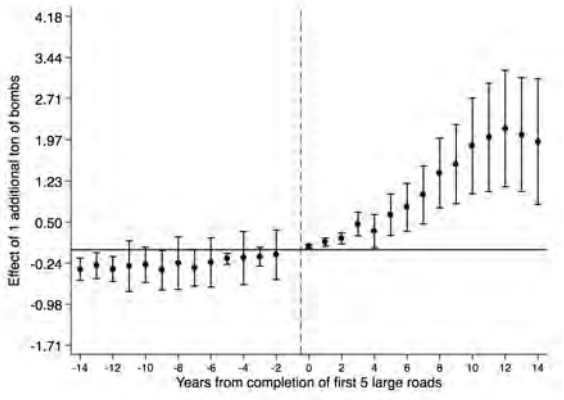
B. Wheat and corn - top five railways



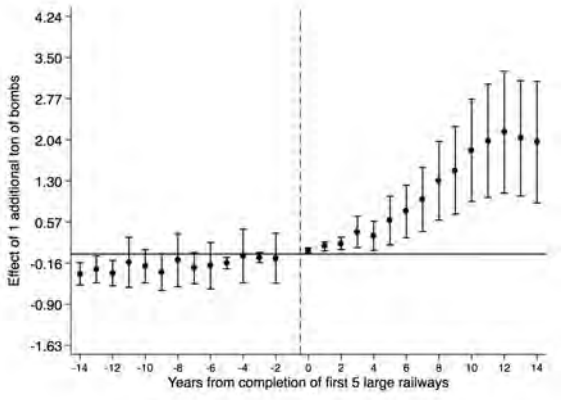
C. Tractors - top five roads



D. Tractors - top five railways



D. All Machines - top five roads



F. All Machines - top five railways

Notes: The regressions are event studies in which period 0 is the completion year of the first five large infrastructure projects (roads in panels A, C, and E; railways in panels B, D, and F), each amounting to at least five percent of total funds assigned to a province, funded by E.R.P aid. Regressions also include province FEs, region-event period FEs, and calendar year FEs, as well as linear, quadratic, and cubic trends in several baseline characteristics (population density, horsepower, employment rate, share of industrial workers, and share of agricultural workers) and in the share of war-related deaths. Standard errors are clustered at the province level. The vertical bars measure 95% confidence intervals. The outcomes are the production of wheat and corn (100kg, panel A and B), the number of tractors (panel C and D), and the number of all motorized agricultural machines (panel E and F). Sources: Annuario di Statistica Agraria, Censimento Generale della Popolazione. USAF THOR Database.

Table C1: Event Study on Infrastructure Development, Placebo Treatments

	Wheat & corn production (1)	Wine production (2)	Grape production (3)	Oil production (4)	Tractors (5)	Threshers (6)
Tons of bombs x Post event	-4.224	-11.094	-19.134	-0.202	-0.010	-0.008
	(17.467)	(12.657)	(17.054)	(0.947)	(0.025)	(0.006)
Observations	452	453	453	453	366	288
R^2	0.971	0.947	0.947	0.868	0.973	0.990
Mean outcome	1,234,237	459,348	694,159	27,196	454	383
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681

Notes: This table shows results from placebo-event studies. The estimating sample includes only periods before the actual completion of large infrastructure projects. The dummy variable Post event turns from 0 to 1 randomly in each province. Regressions also include province fixed effects, region–event period fixed effects, calendar–year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of tractors (column 5), and the number of threshers (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table C2: Event Study on Infrastructure Development

	Wheat & corn production (1)	Wine production (2)	Grape production (3)	Oil production (4)	Tractors (5)	Threshers (6)
Panel A: Top five projects						
Tons of bombs x Post event	57.393***	59.459*	69.731*	0.073	0.510***	-0.008
	(19.214)	(30.504)	(35.561)	(1.188)	(0.168)	(0.009)
Observations	1,938	2,041	2,041	2,055	1,895	1,728
R^2	0.952	0.872	0.888	0.856	0.918	0.894
Panel B: Top five roads						
Tons of bombs x Post event	58.247***	65.938**	78.527**	0.213	0.511***	-0.008
	(19.210)	(31.909)	(37.280)	(1.216)	(0.160)	(0.009)
Observations	1,939	2,041	2,041	2,054	1,892	1,725
R^2	0.950	0.873	0.886	0.855	0.918	0.895
Panel C: Top five railways						
Tons of bombs x Post event	56.796***	59.190*	69.430*	0.095	0.502***	-0.007
	(18.708)	(30.225)	(35.215)	(1.156)	(0.164)	(0.009)
Observations	1,937	2,041	2,041	2,055	1,893	1,730
R^2	0.952	0.872	0.887	0.879	0.919	0.894
Mean outcome	1,234,237	459,348	694,159	27,196	454	383
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681

Notes: This table shows results from event studies that isolate the completion of large infrastructure projects funded by ERP aid. Post event in panel A is 1 after the first five large projects, each costing at least five percent of the total reconstruction budget, were completed. Post event in panel B is 1 after the first five large roads, each costing at least five percent of the total reconstruction budget, were completed. Post event in panel C is 1 after the first five large railways, each costing at least 5 percent of the total reconstruction budget, were completed. Regressions also include province fixed effects, region–event period fixed effects, calendar-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of tractors (column 5), and the number of threshers (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table C3: Event Study on Infrastructure Development, IV

	Wheat & corn production	Wine production	Grape production	Oil production	Tractors	Threshers
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Top five projects						
Reconstr. grants (M) x Post event	10,677.909***	10,963.212*	12,857.245*	13.481	98.583***	-1.167
	(3,903.050)	(6,321.661)	(7,345.798)	(218.478)	(36.906)	(1.371)
Observations	1,938	2,041	2,041	2,055	1,895	1,728
R^2	0.952	0.843	0.867	0.856	0.900	0.894
F-statistic	30.75	31.46	31.46	31.53	32.49	29.71
Panel B: Top five roads						
Reconstr. grants (M) x Post event	10,846.143***	12,151.265*	14,471.117*	39.091	98.253***	-1.231
	(3,957.860)	(6,742.170)	(7,874.598)	(223.593)	(35.040)	(1.372)
Observations	1,939	2,041	2,041	2,054	1,892	1,725
R^2	0.950	0.836	0.859	0.855	0.900	0.894
F-statistic	29.38	29.64	29.64	29.90	32.72	30.39
Panel C: Top five railways						
Reconstr. grants (M) x Post event	10,603.712***	10,939.745*	12,832.320*	17.495	97.776***	-1.122
	(3,847.406)	(6,314.698)	(7,332.643)	(213.207)	(36.690)	(1.388)
Observations	1,937	2,041	2,041	2,055	1,893	1,730
R^2	0.953	0.843	0.867	0.879	0.901	0.893
F-statistic	30.85	31.61	31.61	31.67	32.44	29.44
Mean outcome	1,234,237	459,348	694,159	27,196	454	383
Reconstr. grants (M)- mean	79	79	79	79	79	79
Reconstr. grants (M)- std. dev.	29	29	29	29	29	29

Notes: This table shows results from event studies that isolate the completion of large infrastructure projects funded by ERP aid. Post event in panel A is 1 after the first five large projects, each costing at least five percent of the total reconstruction budget, were completed. Post event in panel B is 1 after the first five large roads, each costing at least five percent of the total reconstruction budget, were completed. Post event in panel C is 1 after the first five large railways, each costing at least five percent of the total reconstruction budget, were completed. The reconstruction grants received by a province (in millions) are instrumented with the amount of explosives dropped during the Italian Campaign. Regressions also include province fixed effects, region–event period fixed effects, calendar year fixed effects, and pre-war characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of tractors (column 5), and the number of threshers (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table C4: Event Study on Infrastructure Development, First Project

	Wheat & corn production	Wine production	Grape production	Oil production	Tractors	Threshers
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: First project			
Tons of bombs x Post event	64.156***	60.472**	71.795**	1.316	0.434**	-0.003
	(20.586)	(30.195)	(35.393)	(1.113)	(0.179)	(0.008)
Observations	1,963	2,065	2,065	2,067	1,907	1,756
R^2	0.951	0.876	0.891	0.854	0.907	0.906
			Panel B: First road			
Tons of bombs x Post event	60.684***	64.225**	77.446**	1.155	0.473***	-0.005
	(21.198)	(27.684)	(32.377)	(1.128)	(0.164)	(0.009)
Observations	1,965	2,066	2,066	2,068	1,910	1,758
R^2	0.951	0.876	0.891	0.854	0.908	0.905
			Panel C: First railway			
Tons of bombs x Post event	64.621***	59.863**	71.077**	1.566	0.435**	-0.003
	(20.465)	(30.017)	(35.151)	(1.081)	(0.179)	(0.008)
Observations	1,961	2,063	2,063	2,066	1,907	1,752
R^2	0.952	0.876	0.891	0.858	0.907	0.906
Mean outcome	1,234,237	459,348	694,159	27,196	454	383
Tons of IC bombs - mean	1,045	1,045	1,045	1,045	1,045	1,045
Tons of IC bombs - std. dev.	1,681	1,681	1,681	1,681	1,681	1,681

Notes: This table shows results from event studies that isolate the completion of large infrastructure projects funded by ERP aid. Post event in panel A is 1 after the first large project, costing at least 5 percent of the total reconstruction budget, was completed. Post event in panel B is 1 after the first large road, costing at least 5 percent of the total reconstruction budget, was completed. Post event in panel C is 1 after the first large railway, costing at least 5 percent of the total reconstruction budget, was completed. Regressions also include province fixed effects, region–event period fixed effects, calendar-year fixed effects, prewar characteristics (population density, employment rate, industrial horsepower, share of industrial workers, and share of agricultural workers) interacted with a trend up to the third order, and the share of war-related deaths interacted with a trend up to the third order. The dependent variables are the production of wheat and corn in 100kg (column 1), the production of wine in 100L (column 2), the production of grapes in 100kg (column 3), the production of oil in 100kg (column 4), the number of tractors (column 5), and the number of threshers (column 6). The estimating sample does not include provinces in Sardegna and Sicilia, because these regions were not affected by bombings related to the Italian Campaign. Standard errors clustered by province in parentheses, *** p<0.01, ** p<0.05, * p<0.1.