# The Growth of the Italian Economy, 18611913: The Composition Of Investment

Fenoaltea, Stefano

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# THE GROWTH OF THE ITALIAN ECONOMY, 1861−1913: THE COMPOSITION OF INVESTMENT

Stefano Fenoaltea*
CESMEP, Department of Economics and Statistics "Cognetti de Martiis," University of Turin

stefano.fenoaltea@unito.it

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## ABSTRACT

Previous papers on Italy's economic growth from Unification to 1913 reestimated 1911-price GDP from the production side, and reconstructed its allocation on the expenditure side; both efforts sharply revised the latest figures in the literature. The present paper examines the composition of investment, as documented by the new series.

# THE GROWTH OF THE ITALIAN ECONOMY, 1861−1913: THE COMPOSITION OF INVESTMENT

Italy's constant-price national accounts from Unification to the Great War are undergoing significant revision. On the production side, the available reconstructions in Fenoaltea (2005) and Baffigi (2011, 2015, 2017) differed little.[1] Fenoaltea (2017a) introduced improvements to the 1911-price value added series for all three major sectors. The industry series, simply updated to incorporate recent research, were little affected. The agriculture series were modified to include on-farm improvements, to exclude double-counted equipment maintenance, and to incorporate previously neglected short-term harvest fluctuations, eliminating the spurious smoothness of the predecessor series. The most heavily amended series were those for the services, in part by improving the indices of production movements, most of all by carefully revising their anchor, the 1911 benchmark (by Zamagni in Rey 1992, updated by Zamagni and Battilani in Rey 2000) which the earlier reconstructions had simply taken on faith. The corrections to the services benchmark vary from component to component, but the net revision is sharply downward; this reduction entails a downward revision of the entire time series for the services sector and, derivatively, of the time series for *GDP*.

Direct data on the expenditure side are so scarce that the latter can only be reconstructed by taking the production-side estimates of *GDP* as a given, and estimating the expenditure-side components from the structure of production and trade. The revision to the production side entailed a parallel revision to the expenditure side (Fenoaltea 2018a). The recent 1911-price estimates of the expenditure side were obtained from similar production sides, but with different algorithms, and came out with significant differences. Fenoaltea (2012) simply allocated production and trade subaggregates to the components of the expenditure side; Baffigi (2011, 2015, 2017) borrowed the new construction and public consumption series from the earlier literature, but estimated other investment and private consumption by relying on three benchmarks (the 1911 benchmark in Rey 2002, an 1891 benchmark obtained by deflating the current-price benchmark also in Rey 2002, and a newly-constructed one for 1871), interpolating them with imports alone, and rescaling the results to meet the production-side *GDP* constraint. His interpolating algorithm gave hostages to fortune: imports and domestic production *may* move together, but will systematically diverge in the presence of tariff changes (in the mandated specific rates, and in their *ad valorem* levels as the price level varies), supply shocks (the "grain invasion"), and demand shocks (because the short-run supply

[1] These recent estimates are referred to as "second-generation" estimates because they depart from the international standard methodology that informed the "first-generation estimates" (in the Italian case, Istat 1957 and Fuà 1969): they do not acritically incorporate historical data, good and bad, they are built up from relatively disaggregated series to capture composition effects, they do not mindlessly attribute the time path of observed production to unobserved production ("of the same [arbitrary] sector"), and they abandon the wrong-headed "double-deflation" approach to "real value added." They are essentially 1911-price-value-added-weighted quantity series; the aimed-for "third-generation" estimates are current-price value added series deflated by a common index (thus reflecting changes in relative prices, which are as "real" as changes in quantities), and the hoped-for "fourth-generation" estimates will actually measure gross domestic product rather that the muddle-headed index we now call *GDP*, and use as if it measured exactly that (Fenoaltea 1976, 2010).

elasticity of domestic production is lower than that of imports, a jump in demand sees imports surge and then decline while domestic production steadily increases).

In the event the private consumption series in Baffigi (2011, 2015, 2017) is generally higher than, but otherwise much like, the corresponding series in Fenoaltea (2012); the gross differences are in the investment series. Fenoaltea (2012) attributes to investment the familiar ("Kuznets cycle") long swing, already obvious in the durable-goods production-side estimates; Baffigi (2011, 2015, 2017) attributes to investment a path dominated, from a low initial level, by an upward jump in the early 1870s, and another from the turn of the century to 1907. The new estimates in Fenoaltea (2018a) retain the prudent methodology of Fenoaltea (2012), albeit with a much-extended disaggregation. Since the major production-side revisions concern agriculture and the services, relatively little involved in investment, the 2018 fixed-investment series essentially reproduces its 2012 predecessor: the long swing in total investment again appears *in ipsis rebus*, and the different path obtained by Baffigi seems due to the weakness of his import proxies. The cuts to the production-side estimates for the services show up, correspondingly, as cuts to estimated consumption, which now appears systematically lower than in Fenoaltea (2012) and, *a fortiori*, Baffigi (2011, 2015, 2017).[2] It bears notice, however, that the reduction in the (constant-price) value of consumption is a reduction in the costs of the attendant distribution (the trade and transportation margins), not in the quantities of goods consumed: it is devoid of welfare implications.

We reconstruct the past to understand it, to explain to our satisfaction *why* things went the way they did. We are, of course, very easily satisfied, and the literature is full of explanations ("hypotheses," but that is just a trope) set forth on the basis of evidence that certainly admits them, but as readily admits innumerable alternatives. To narrow the field we must look beyond, or more precisely within, the broad aggregates with which we too often rest content, to verify that the story we tell is consistent with finer-grained evidence; and if we are concerned with economic development our focus must be not on aggregate domestic product (which can grow for a spell thanks to no more than favorable weather) but on capital formation, on investment – and by the same token not on aggregate investment (which can be in palaces and amusement parks as well as in means of production), but on its various components.

The reconstruction of the expenditure side in Fenoaltea (2018a) disaggregates *GDP* only into private consumption, fixed investment, inventory investment, public consumption, and exports and imports.[3] This paper considers the composition of fixed investment. At that, it does not even attempt the desired disaggregation by destination, distinguishing for example investment in agriculture, and investment in industry; it is limited to a partial (but, as a first step, necessary) disaggregation by instrument, distinguishing for example investment in structures, and investment in machinery. *Est tempus in rebus.*

As may be recalled, Fenoaltea (2018a) estimated fixed investment (imports aside) by aggregating not the value of final investment goods, but the value added in the production of intermediate and final investment goods: a procedure followed because the production-side estimates fully document (or "document") value added, but not the production of final goods. A number of these can be identified, including, most significantly, structures and (metal) machines; but (to

[2] The short-term harvest fluctuations introduced to the production side in Fenoaltea (2017a) do not show up in consumption; they are absorbed by a new inventory-investment series, altogether absent from Fenoaltea (2012).

[3] The reconstruction in Baffigi (2011, 2015, 2017) is more ambitious, as it already distinguishes housing construction, other construction, "plant, machinery, and transport equipment," and other fixed investment; but the failure to distinguish plant and machinery from transport equipment muddies the distinction between business investment and infrastructure investment, which turns out to be all-important (Fenoaltea 2017b). An even more ambitious breakdown, by type (housing, public works, machinery and vehicles, non-residential structures, other) and by destination (housing, agriculture, industry and services, public infrastructure) appears in Fuà (1969), but the underlying estimates are so poor that these figures are of little use.

anybody's knowledge) no evidence directly documents the distribution of other products – notably those of the (overwhelmingly artisanal) wood-working and hardware industries – between final goods in their own right (e.g., tools, wood machines) and goods incorporated in the product of other industries (e.g., wood doors and windows, or metal gates and blinds, incorporated in structures).

The present investigation accordingly begins by disaggregating, by product, the 1911-price fixed-investment aggregate (section 1). Numerous major components, as noted, can be directly identified; what is left over is taken as an estimate of the unobservable final goods (of wood and fabricated metal) – a very rough estimate, inevitably, as we are dealing here with a residual that inherits all the errors of its parent figures. These estimates reaffirm the long-established presence of a long swing in investment in infrastructure, and the recently-established *absence* of that swing in investment in ordinary (industrial and agricultural) metal machinery (Fenoaltea 2017b, Pezzuto 2017). The novel result is that investment in tools (and wood machinery) also apparently followed the familiar long swing, with super-normal growth over most of the 1880s, a decline into the early '90s, and renewed growth from the turn of the century.

The additional evidence reviewed in earlier work suggested that the long swing in investment in infrastructure (and, derivatively, in total investment and *GDP*) was due to variations in the supply of finance, determined over most of the period at hand by "autonomous" developments in the international market for capital (Fenoaltea 1988, 2011a, ch. 2). The obvious hypothesis here is that investment in tools was similarly determined by the availability of finance: not from the international banks and bond market tapped by the State, not from the local banks tapped by private builders, but simply the retained earnings of the artisans themselves.

With all investment thus identified, directly or indirectly, the question of its composition can finally be addressed (section 2). Clearly, the composition of a value aggregate is meaningfully gauged only at current relative prices; but the direct recalculation of the investment series on a current-price basis is too great an effort to be embarked on here. Following precedent (Fenoaltea 2011b, 2015), what is produced here is a simple first approximation, obtained from the available constant-price series by crudely correcting them to allow for differential productivity growth.

What emerges on this approximate current-relative-price basis can be summarized as follows. First, the ratio of investment in new goods to investment in maintenance varied of course as new investment followed the long swing, and maintenance did not; cyclical variations apart, that ratio appears essentially to have remained stable, near 3 to 1.[4] Within investment in new goods, the share of precious-metal display goods was trivial, declining from perhaps one percent to half that. Of the significant components of investment in new goods, agricultural improvements and breeding varied most: their share was typically in the 5-to-15 percent range, but with a maximum approaching 20 percent in 1878 and 1879, and near-zero minima in 1889 and 1899. The share of private structures was normally in the 10-to-15 percent range, but with a peaks approaching 20 percent in 1874 and not much less than that in 1904−05 and again in 1911−13. The share of other infrastructure, ships, and trains drifted down, with cyclical variations, from 40 to 50 percent in the early years to a minimum of 20 percent in 1896, and then recovered to some 30 percent by 1913. The share of (metal) machinery grew relatively steadily from some 5 percent at Unification to a peak of some 30 percent in 1908, and then fell back to nearer 20 percent by 1913. The share of tools (and wood machinery), finally, appears to have remained between 30 and 40 percent through the nineteenth century, and then to have drifted down to nearer 25 percent: figures that are large, but perhaps not surprisingly so, in a country that was and largely remained a land of artisans and cultivators.

Some implications for the literature are considered below, by way of conclusion (section 3).

[4] For what appear to be sufficient reasons (Fenoaltea 2018a, footnote 28), the present estimates of fixed investment include maintenance; but maintenance is separately identified, not least to facilitate comparisons with the maintenance-excluding estimates in the extant literature (e.g., Vitali in Rey 1992, pp. 314−315; Baffigi 2011, p. 63, with reference to his investment-in-construction series).

## 1. Disaggregated investment at constant prices

*1.1 The construction of the estimates*

Table 1 collects the extant 1911-price value estimates of aggregate fixed investment (col. 1, from Fenoaltea 2018a), and of its directly identifiable components (cols. 2–17).[5] To keep the number of components within bounds these are already subaggregated as far as the literature allows; Appendix A describes their sources, which document their internal composition. In general, it will be recalled, the production estimates for goods that were a long time a-building distribute the value added estimates over the corresponding period, and so do the "fixed" investment value estimates (as opposed to counting the investment in a yet-uncompleted railway or battleship as inventory investment, attributing its entire value to fixed investment in the year of completion, and in that year reducing inventories by the cumulation of prior investment).[6]

Col. 2 refers to the investment by agriculture in agriculture itself, that is, to improvements and herd increments. Cols. 3 and 4 refer respectively to investment in new construction and in the maintenance of structures; these estimates are in principle exhaustive.

Cols. 5−9 refer to the other identifiable components of investment in transportation systems: col. 5 to investment in off-farm horses (including those for the army, with all due respect to the cavalry), cols. 6−9 to investment in ships and in rail- (and tram)way rolling stock, distinguishing within each between new equipment and maintenance. These estimates fall short of an exhaustive tally of investment in vehicles, as they omit the boats and carts produced by the ill-documented wood-products industry.

Cols. 10−15 refer to investment in the other products of the (metal-processing) engineering industry. Cols. 10 and 11 refer to investment in maintenance, respectively of fabricated metal (in the main, tools) on the one hand, and of other (general and, negligibly, precision) equipment on the other. Cols. 12−14 cover investment in new products: in general equipment (ordinary industrial and agricultural machinery) and in precision equipment (precision instruments) – net, in both cases, of those installed in ships − and in precious-metal products (these last measured by value added rather than value, to be net of metal-inventory disinvestment). Col. 15 refers to investment in new fabricated metal (hardware), but it is a horse of a different color, as the present figures remain gross of the hardware absorbed by the construction industry (and others, e.g., shipbuilding): it partly duplicates the other series in the table, and cannot be simply added to them. To highlight this peculiarity, the figures in col. 15 are presented in italics.

Col. 16 refers to investment in wood products. These figures are in italics, like those of col. 15, and for exactly the same reason: they are gross of the components absorbed by other investment, in particular in structures.

Col. 17 transcribes the estimated investment value added of the services group, here considered, for simplicity, as a single aggregate. These figures too are italicized, as they too contain the transport and intermediation costs that burdened the raw materials of the commodity-producing

[5] As just noted, the present estimates include maintenance. The latter is attributed to the construction and engineering industries alone; and ships and railway vehicles apart the engineering industry is here defined as a metal-processing activity. The wood-processing industry also produced durables, but its maintenance activity is not here separated out. The maintenance of the wooden elements of structures is included in the construction industry; wooden tools are not amenable to the sharpening and reforging typical of metal tools, and to a first approximation when broken or worn out they are replaced rather than repaired. Wood machines (e.g., a water wheel) may well undergo repair; that activity is undocumented, and here neglected.

[6] Because investment goods that involve inordinately long production processes are thus counted on an accrual basis, the complementary estimates of inventory investment include only changes in the inventories of final goods (to smooth consumption), and ordinary goods in process and held for sale (because production and distribution take time).

(and maintaining) industries, and are therefore already included, to that extent, in cols. 1−16. But they are not entirely double-counted, for the estimated values of new mobile final goods other than vehicles (in essence, those covered by cols. 12−16) are essentially at f.o.b. prices (at the border or the factory), and exclude the cost of domestic transportation and intermediation. It also bears notice that from end to end the contribution of the services grew near sevenfold, where total (fixed) investment barely quadrupled: a disparity that reflects the improvement in transportation, and the increase in transportation (and in the complexity of commercial distribution) that accompanies the concentration of production where it is in fact cheapest.

Table 2 presents some manipulations of the time series in Table 1. Col. 1 is the ratio of Table 1, col. 17 (investment services) to the sum of Table 1, cols. 3−16. It is not a ratio of distribution costs to production costs, for as just explained the denominator includes the distribution costs of raw materials and intermediate goods, and double-counts some production costs; but it should serve as a rough index of such a ratio, and in that light comfort can be taken both from its rough doubling from just over a tenth in 1861 to just over a fifth in 1913, and from the mildness of its deviations from a steady trend (Figure 1).

Col. 2 is instead the difference between aggregate fixed investment in Table 1, col. 1 and its properly identified components in cols. 2−14; this residual corresponds to the sum of cols. 15−17 (hardware, wood products, services), net of the components of these last already counted in cols. 2−14. Recalling the content of Table 1, cols. 15−17, specified above, Table 2, col. 2 covers, in essence, metal tools (f.o.b.); wood tools and machines (again f.o.b.); the distribution costs of the preceding; and the distribution costs of the other finished mobile goods in Table 1, to wit, horses (col. 5) and new engineering-industry general equipment, precision instruments, and precious-metal products (cols. 12−14).

Col. 3 transcribes the c.i.f. estimates of investment in those four product groups, obtained as the sum of the f.o.b. estimates in Table 1, cols. 5 and 12−14 inflated by a distribution margin itself calculated as simply four times the margin-proxy in Table 2, col. 1 (and accordingly rising from 43 percent of the f.o.b. value in 1861 to twice that in 1913). Possible differences between the product groups are ignored: ordinary machinery appears to have incurred relatively high transport costs (Giordano 1864, p. 419), but this was likely offset by the relative proximity of consumers and producers, both disproportionately northern.

Col. 4 transcribes the analogous c.i.f. estimates of gross investment in fabricated metal and wood products, including those incorporated in structures, ships, etc.; these are obtained just like col. 3 from the sum of the corresponding f.o.b. estimates, here those in Table 1, cols. 15 and 16. Of that sum, it may be noted, the wood-products component is the major one, albeit by a cyclically variable (and slowly declining) margin: it accounts for some four fifths of the total in the 1860s and ’70s, dips over the boom of the 1880s to just over one half, recovers to near four fifths around the turn of the century, and drops again to near half over the boom of the *belle époque* (suggesting that of the two the fabricated-metal industry was much the more closely tied to construction, cf. Fenoaltea 2017b).

Col. 5 transcribes the analogous c.i.f. estimates of net investment in fabricated metal and wood products, excluding those incorporated in structures, ships, etc.; these are obtained as a residual, much like that in col. 2, save that total fixed investment (Table 1, col. 1) is reduced by its properly identified components uniformly valued c.i.f. (still Table 1, cols. 2−4 and 6−11, as these are immobile goods, but for the mobile goods Table 2, col. 3 rather than Table 1, cols. 5 and 12−14). No attempt is made here to disaggregate this residual into its own components: *il faut quand même un peu de pudeur*.

Col. 6, finally, reports the ratio of col. 5 to col. 4, that is, the implied share of fabricated metal products and wood products that were final goods in their own right (tools, wood machines), and not goods incorporated in structures or ships. Col. 5 is a residual that inherits all the blemishes of its parent series, and neither it nor col. 6, obviously, can taken *au pied de la lettre*.[7] Col. 6 serves here

[7] The early dip and recovery after 1861 looks much like the mirror-image of estimated construction of new private structures (Fenoaltea 1988), derived in those years from a very small (and, the present results suggest, perhaps unrepresentative) sample; see Fenoaltea (2015K), ch. K.08 and section K10.02.

as a test of the intrinsic reasonableness of col. 5 itself; and the latter would seem to pass that test, as the share of truly final goods grows from ca. half to over two thirds over the initial decades of the period at hand, and then remains roughly constant. What drives that path cannot be determined; but it bears notice that investment in metal machinery grew especially rapidly (Table 1, col. 12), and it is reasonable to imagine similarly rapid growth in investment in wood machinery (or in the wood components of mixed-material machines), at least until the coming of cheap steel altered the mix of cost-minimizing materials.

*1.2 The burden of the evidence*

Table 3 provides a user-friendly summary of the estimates of investment at 1911 (c.i.f.) prices. Cols. 1 and 2 disaggregate total fixed investment (Table 1, col. 1) to distinguish maintenance from investment in new goods. Col. 1 is the sum of Table 1, cols. 4, 7, and 9−11; col. 2 is the residual, equivalent to the sum of Table 1, cols. 2−3, 6, and 8 and Table 2, cols. 3 and 5.

Cols. 3−9 decompose fixed new-good investment at 1911 (c.i.f.) prices. Col. 3 refers to investment by and in agriculture, plus investment in off-farm horses; it is the sum of Table 1, cols. 2 and 5, with this last scaled up to c.i.f. values as described above. Cols. 4 and 5 relate to new construction; the total in Table 1, col. 3 is here decomposed to separate private structures (Fenoaltea 1988, Table 1, col. 5) from other construction (transport systems, other social overhead capital). Col. 6 refers to transport systems' mobile hardware, ships and railway vehicles (Table 1, cols. 6 and 8). Col. 7 refers to general and precision machinery together (the sum of Table 1, cols. 12 and 13, again scaled up to c.i.f. values). Col. 8 refers to tools, of metal and wood, and wood machines (again valued c.i..f.: Table 2, col. 5). Col. 9, finally, refers to display goods (precious-metalware, Table 1, col. 14, again brought up to c.i.f. values). Together, within rounding error, cols. 3−9 sum to col. 2.

The estimates in Table 3, at constant prices, document the movements of quantities; they are illustrated in Figure 2. Over the half-century from 1861 to 1911 population increased by some 40 percent (*Sommario*, p. 39). Against that, we see a doubling of the quantity of maintenance work (col. 1), and of social-overhead new construction (col. 5); closer to a trebling in the quantity of investment by and in agriculture (and in off-farm horses, col. 3), and in display goods (col. 9); a near sixfold increase in the quantity of new private structures (col. 4), social-overhead vehicles (col. 6), and tools-plus-wood machines (col. 8); and nearer a thirty-fivefold increase in the quantity of (other) metal equipment (col. 7).

Three time series display idiosyncratic paths. Aggregate investment in maintenance (col. 1) is practically a steadily-rising trend. Aggregate investment by and in agriculture (and off-farm horses, col. 3) goes much its own way, growing in the 1870s but generally stagnating from 1880, with occasional brief collapses (in the late 1880s when tariff increases and the tariff war with France halted conversions to vineyards, again around the turn of the century when herds were apparently culled, Fenoaltea 2018a, Table A7), and an upside outlier in 1908 (tied to a 6 percent increase in the herds' overall value at 1911 prices, twice the next highest figure, ibid.). Aggregate investment in (metal) machinery (col. 7) grew very rapidly, with brief setbacks at roughly decadal intervals; this path has been established only recently (Fenoaltea, 2017b), and has yet to be explained.

Aggregate new-good investment (col. 2) followed the Kuznets-cycle long swing of construction activity, established and analyzed decades ago (Fenoaltea 1988; also 2011a, ch. 2). On the evidence that was brought to bear it seems tied to international finance: first to the willingness to invest specifically in Italy in the immediate aftermath of Unification (until the fiascos of 1866), and then to variations in the more general willingness to invest in the periphery, with no specifically Italian features at all (until, perhaps, the victorious war with Turkey, not by chance on the very eve of the World War). As has been pointed out this path is largely shared by the private and public components of investment in structures (Figure 2); the main difference is over the late 1880s, as

private construction collapsed immediately the bubble burst in 1887 (and then partly recovered), while public construction fell a bit later and more slowly, as declining capital imports and the spreading crisis curtailed the State's own capacity to borrow and spend.

A similar long swing is found here, unsurprisingly, in investment in vehicles (col. 6). Over the long upswing from the mid-1890s it displays two idiosyncratic intermediate peaks, the first around the turn of the century (due it would seem to merchant-shipping subsidies and to the electrification of tramways), the second in 1907 (and patently tied to the renovation of the railway system after the creation of the State railways in 1905). The long swing is also found here, most interestingly, in investment in tools and wood machines (col. 8): the medium-term path follows a relatively steady trend, save for the characteristic sharp upswing through most of the 1880s, and the ensuing decline.

The inclusion of wood machines may curb this series' growth rate, especially over the later decades; but judging by the path of investment in metal machinery the sharp cycle over the 1880s and early 1890s was not in machinery at all, but in tools. But that the cycle in investment in tools should parallel that in structures is not self-explanatory: if the tools were needed to build the structures they should have moved not like the structures series but like its first derivative, the need for *added* tools being greatest not when construction peaked, but as it expanded most rapidly.[8]

To this old dog, the most likely explanation does not require a new trick. The vagaries of investment in Italy appear to be explained not by variations in output, but by variations in the desired capital/output ratio (Fenoaltea 1969). That ratio, and therefore investment, may have varied with investors' confidence (ibid.: the "political cycle" hypothesis, since abandoned), or, more convincingly, with the supply and cost of capital (Fenoaltea 1988, 2011a, ch. 2).[9] The State borrowed from the public and from leading banks, at home and abroad, builders borrowed from banks; the artisans who used and bought tools presumably could not. Their source of finance, one presumes, was their retained earnings; and if that is so it is not surprising that they should have invested most in adding to their stock of tools when the *level*, and not the growth rate, of their activity was at a peak.

The productivity-enhancing motivation for such investment may bear comment. Machinery is obviously labor-saving, in industrial factories, in agriculture, in artisans' shops too, as when a sewing machine replaced a hand-held needle. Tools save labor from time immemorial, sewing with a needle is much easier than sewing without one; but the evidence here points to an increase in the stock of tools *per worker*, and this investment saves labor in subtler ways. One imagines here two typical scenarios. One is that of a carpenter, say, passing from a single hammer to a battery of differentiated hammers, calibrated to the size of the nail that must be driven. The other is that of a five-person tailor's shop, say, passing from a single pair of scissors to five: the tool is no longer shared, each worker now has one, and work is no longer interrupted as one worker waits for another to finish using the tool and hand it over.

## 2. The composition of investment

### *2.1 The construction of the estimates*

[8] Tool use and replacement naturally follow the structure-investment cycle, but tool purchases as a whole would not unless tools were so short-lived as to behave as raw materials.

[9] The early "political cycle" hypothesis was based on the then-available "engineering" series, which grew fairly regularly across the 1860s and '70s, while the "Old Right" held sway; the subsequently-derived construction series were the first to document the sharp cycle of the early 1870s, which didn't fit that hypothesis at all.

There is something deeply wrong-headed with examining the composition of a value aggregate calculated, and disaggregated, with inappropriate relative prices. That is why the disaggregated 1911-price figures in Table 3 are a poor guide to the actual composition of investment; and that is of course (yet another reason) why we want our "real" measures to maintain a constant price *level*, but to reflect *current* relative prices (i.e., why we want the not-yet-available "third-generation" estimates rather than the present "second-generation" interim figures: above, footnote 1). Conceptually, the problem is that if we use constant (1911) prices as we go back in time the technologically more progressive activities are increasingly undervalued relative to the less progressive ones; the conceptually simple solution is to correct the various constant-price series to reflect relative technical progress.

In general, of course, the best evidence we have of relative technical progress is the evolution of relative prices; but credible price series are not yet available (e.g., Fenoaltea 2018a, footnotes 5, 7), and their construction here is *ultra vires*. In the interim the practical solution is to lower one's standards, and to accept a quick-and-dirty calculation that is at least a step in the right direction.

The results of such a calculation are presented in Table 4, organized exactly like Table 3, but differently derived from Tables 1 and 2. The basic algorithm is as simple as could be: the various components of fixed investment are divided into two categories only, to separate goods and activities that benefited from (significant) technological progress from those that did not. In the case of the latter, the 1911-price series are taken over as they are. In the case of the former, heroically, a uniform correction is applied: assuming a productivity growth rate $\tau$, with $V_k$ identifying the 1911-price estimate, $V$ the corrected estimate, and $t$ the year, $V_t/V_{kt} = (1 + \tau)^{(1911 - t)}$. Here, $\tau$ is set equal to 2.44 percent per year, an evidence-based figure used in generating the production estimates for the engineering industry (Fenoaltea 2015F, section F04.11); in 1861, the resulting correction $V_t/V_{kt}$ equals approximately 3.34.

Here, the new production of vehicles, machines, tools, and display goods is considered technologically progressive; cols. 6−9 in Table 4 are accordingly cols. 6−9 in Table 3, multiplied through by $V_t/V_{kt}$. Other new production – agricultural improvements and breeding, construction – is considered technologically stagnant; cols. 3−5 in Table 4 accordingly reproduce cols. 3−5 in Table 3. In Table 4, col. 2 (total investment in new goods) is the simple sum of cols. 3−9. Correcting for the progressive cheapening of the investment goods, from 1861 to 1911 investment in metal machines (col. 7) increased nearer tenfold than thirty-fivefold, total investment in new goods (col. 2) nearer threefold than fivefold.

The derivation of the maintenance series in Table 4, col. 1 is more complex. In general, maintenance is a manual process, essentially devoid of technical progress; the major exception is the maintenance of ships and railway vehicles, carried out in ever-more-capital-intensive yards and shops similar to those used to produce those vehicles in the first place. Table 4, col. 1 is accordingly the sum of two components. One is Table 3, col. 1, reduced by the sum of Table 1, cols. 7 and 9; the other is that very sum, multiplied through by $V_t/V_{kt}$. At 1911 prices (Table 3), from 1861 to 1911 the maintenance of ships and railway rolling stock grew over tenfold, other maintenance less than doubled; as one goes back in time the component that gets scaled up is an ever smaller part of the total. Total maintenance is accordingly not much affected: from 1861 to 1913 it grows by a factor of 2.1 at 1911 prices (Table 3), at the 1911 price *level* (Table 4) that factor is reduced only marginally, to 2.0.

*2.2 The burden of the evidence*

Figure 3 illustrates the estimated composition of investment, as derived from Table 4; the composition of investment at 1911 prices, from Table 3, is also illustrated, to bring out the attendant distortion. Panel A illustrates the share of new-product investment in total investment; since the maintenance component is close to a simple trend, the path of that share is similar to the path of new-product investment itself (Figure 2, panel A2), characterized, as usual, by the long cycle. At 1911 prices, cyclical movements apart, the share of new-product investment appears to be generally rising;

in fact, it appears to have been more nearly constant, with a mid-cycle value between 70 and 75 percent. Panel B illustrates, in separate graphs to avoid clutter, the path of the major components of new-product investment.

The share of agricultural improvements and breeding varied widely, typically between 5 and 15 percent, but with a maximum near 20 percent in 1878 and 1879 (well under the 25 percent of the 1911-price series), and minima near zero in 1889 and 1899. The share of private structures also displayed sharp cyclical variations. Over the period at hand its trend value seems to have risen by a few percentage points, from just below 15 percent to just above it; the 1911-price series point to a mild decline rather than a mild increase.

The next graph illustrates the share of investment in social-overhead infrastructure, and in largely complementary ships and rolling stock, together (Table 4, cols. 5 plus 6); going back in time the correction for changes in relative prices would reduce the former component, and increase the latter. The net effect is dominated of course by the major component, infrastructure; over the period at hand the share of this social-overhead investment declined from some 40 percent and more (and not 50 percent and more, as the 1911-price series would have it) to 25-to-30 percent.

A clear upward trend is instead evident, as expected, in the share of machinery. That share was apparently a little above 5 percent in 1861 (and not a little below it, as the 1911-price series suggest), and grew and grew to over 20 percent in 1913; it peaked at some 30 percent in 1908, after which machinery investment fell while construction continued to increase.

The share of tools (and wood machinery) displays short-term variations that, for the reasons noted, cannot be taken altogether seriously. Over the longer term it appears to have drifted down from some 35 percent at Unification to nearer 30 percent around the turn of the century – the 1911-price series would have it drifting *up*, by an even greater margin – and then to have dropped more sharply, to some 25 percent over the run-up to the War.

The share of investment in display goods was ever trivial, by either measure.

Figure 4 takes a closer look at the composition of productivity-enhancing new investment, which here excludes investment in agricultural improvements and herd increments (and off-farm horses), in private structures (essentially housing), in precious-metal display goods, and in naval vessels (Table 4, cols. 3, 4, and 9, and $V_t/V_{kt}$ times Fenoaltea 2018b, Table 1, col. 56); its three components are investment in (other) infrastructure and related vehicles excluding naval vessels, in metal machines, and in tools and wood machines (ibid., respectively cols. 5 plus 6, col. 7, and col. 8, reduced by the just-noted naval ship figures), with the *caveat* that infrastructure still includes fortifications and more, and machinery weapons.

Figure 4 illustrates the shares of investment in (for brevity) "infrastructure," "machinery," and "tools" in their joint total. Tools emerge as long the largest single component: they remained near 40 to 50 percent of the total from Unification through the turn of the century, only to the dip to some 30 percent in 1908, and recover to some 35 percent in 1913. Infrastructure was long a close second: from 1861 to the early 1890s it drifted down from over 40 percent to just under that, only to drop sharply to less than 30 percent and finally partly recover to just over 35 percent in 1913. Machinery, by the same token, was long a distant third, roughly doubling from under 10 percent in 1861 to 20 percent in 1894; it then soared to 30 percent and more, peaked well in first place with a 40 percent share in 1908, and then drifted back down to a third-place 30 percent in 1913.

It would be well to refine the underlying series, to remove military weapons as well as naval ones, to remove from infrastructure fortifications and prestige projects (like the hideous, and hideously expensive, Victor Emmanuel monument in Rome). How far one could actually go in that endeavor is not clear; but the endeavor itself is here again *ultra vires*, and all one can say is that the share of tools would presumably appear even larger, once the other series were cleaned up and scaled down.

## 3. Some implications for the literature

The interpretations of Italy's economic growth have paid more attention to aggregate investment than to its composition; the long swing of the aggregate whose composition is investigated here was ascertained decades ago (Fenoaltea 2011a, chs. 1 and 2, 2018a), so nothing of substance needs to be added here.

A significant difference in the path of the components is observed above, as the evidence points not to a long swing, but to relatively steady growth, in investment in (metal) machinery. That investment is our best proxy for investment specifically in industry: we had all presumed that it too followed the long swing, and as that presumption seems thoroughly in error the historiography of the last half-century and more goes swiftly down the tubes. A major result, but not a new one, as its implications have already been developed (Fenoaltea 2017b).

Further considerations bring us back to the very beginning of the postwar literature. Rosario Romeo is little known in the English-speaking world, as his work has reached it only though Alexander Gerschenkron's increasingly malevolent critique (Fenoaltea 2011a, ch. 1, and references therein); but he was Gerschenkron's contemporary, and in this particular field very much his equal. More significantly, for present purposes, he represents an exception to the opening statement of this section, as the story he told turned very much on the (then quite undocumented) composition of investment. In his logical, proto-rostowian account, an adequate infrastructure (in essence, a railway system) is a necessary prerequisite for industrial growth; in capital-constrained Italy, the State quite rightly steered investment into infrastructure in the 1860s and '70s, and then into industry. As far as we can now tell investment in infrastructure much exceeded investment in industrial machinery through the 1860s and '70s, as he thought; but on that score nothing would change through the 1880s and beyond, and his claim that the prerequisites were created over the first two decades receives no support at all.

How would Romeo have shaped his account, had he had in his hands the evidence and estimates presented here? If one takes the changing composition of investment as a guide to *when* the prerequisites were in place and industry could "take off," the present figures (and Figure 4) point to the mid-1890s, as Gerschenkron had argued; but Romeo could have salvaged the rest of his story, as the expansion of the railway net actually came to an end right about then (ibid., p. 171).

This exercise in counterfactual historiography will go no further, not least because the entire stages-of-growth approach that underpins Romeo's story (and Gerschenkron's) is to be dismissed: the international mobility of labor, capital, and technology tied local development to the location choices of internationally mobile entrepreneurs, and the local creation of necessary prerequisites is a will o' the wisp (ibid., ch. 1).

## APPENDIX A: THE CONSTRUCTION OF TABLE 1

Col. 1 (total fixed investment) transcribes Fenoaltea (2018a), Table 1, col. 2.

Col. 2 (investment by agriculture in agriculture) is the simple sum of Fenoaltea (2018a), Table A7, cols. 1 (improvements) and 6 (herd increments).

Col. 3 (investment in new construction) is taken directly from Fenoaltea (1988), Table 1, col. 5). The value figures in col. 4 (investment in the maintenance of structures) are estimated as the sum of the value added estimates for the maintenance of railways, other public works, and private structures (Fenoaltea 2015K, Summary Table K.1, respectively cols. 7, 11, and 13), divided by the corresponding ratio of value added to value (an estimated .6 throughout, ibid., sections K05.04, K06.05, and K09.06).

Col. 5 refers to purchases of off-farm horses, including those for the army; it is the simple sum of Fenoaltea (2018a), Table A7, cols. 4 (civilian) and 5 (military).

Col. 6 (investment in new ships) is the simple sum of the separate (1911-price-value-of-purchases) estimates for naval and merchant vessels in Fenoaltea (2018b), Table 1, col. 56 and Table 5, col. 12. Col. 7 (investment in ship maintenance) is similarly the sum of two components. The first refers to naval vessels; it is obtained as the value added series (Fenoaltea 2015F, Summary Table F.1, col. 30), divided by .5 (to allow for the relatively high cost of upgrading equipment, ibid., section F02.04 and the public budgets there cited). The second refers to merchant vessels; it is obtained as the sum of the three partial value added series (ibid., Summary Table F.1, cols. 31−33), divided by a more conservative .6.

Col. 8 (investment in new railway rolling stock) is obtained as the sum of separate net import and production series for locomotive, passenger car, and freight-car tonnages (ibid., Table F.34, cols. 2, 5, and 8 and Table F.38, cols. 1−3) weighted by 1911-price values per ton (respectively 1,640, 1,402.5, and 690 lire per ton: ibid., section F03.08). Col. 9 (investment in railway rolling stock maintenance) is a value aggregate that sums over the nine components of the corresponding value added series, which refer respectively to the locomotives, passenger car, and freight cars of the railways, the electric tramways, and the steam tramways. The three railway-vehicle components are the value added series (ibid., Summary Table F.1, cols. 34−36), each divided by the estimated ratio of value added to value (locomotives, 25.38/30.22; passenger cars, 13.39/16.07; freight cars, 18.69/24.38, ibid., section F03.09). For simplicity, and in the absence of more direct evidence (ibid., section F03.10), the tramway-vehicle value added series (ibid., Summary Table F.1, cols. 37−42) are here scaled up using these self-same ratios; the extension of the first from steam power to electric power is a stretch, but as the relevant electric-tramway value added figure peaks at some 4 million lire it should not introduce significant error.

Col. 10 (investment in fabricated-metal maintenance) is aggregate value added in fabricated-metal maintenance (ibid., Summary Table F.3, col. 8), net of the consumer-good component (Fenoaltea 2018a, Table A5, col. 1), scaled up assuming a ratio of value added to value equal to .75. Col. 11 (investment in general-equipment and precision-equipment maintenance) sums over two components. The general-equipment series is obtained from the corresponding value-added aggregate (Fenoaltea 2015F, Summary Table F.3, col. 11), net of the consumer-good component (Fenoaltea 2018a, Table A5, col. 3), again assuming a ratio of value added to value equal to .75; the precision-equipment maintenance series is similarly obtained from the corresponding value-added aggregate (Fenoaltea 2015F, Summary Table F.3, col. 12), net of the consumer-good component (Fenoaltea 2018a, Table A5, col. 5), assuming a ratio of value added to value equal to .9. As it turns out, the precision-equipment value estimates are always insignificant, and col. 11 captures in fact the maintenance of general equipment (ordinary machinery) alone.

Col. 12 (investment in new general equipment, i.e., ordinary machinery) is derived in Table A1. Table A1, col. 1 transcribes the estimated tonnage of such machines produced and imported (Fenoaltea 2017b, Table 1, cols. 3 plus 4, Table 2, col. 3); cols. 2 and 3, the estimated tonnage of

motor vehicles and bicycles acquired, estimated as described in Fenoaltea (2018a), §A4.1.6.2 (the motor-vehicle series is a stock estimate for 1911 extrapolated to 1891-1913 assuming constant growth, the bicycle series is based on licensing-fee data); col. 4 is obtained as col. 1 less cols. 2 and 3, and thus tracks the tonnages of investment goods alone. This last series, however, remains gross of the (propulsion and other machinery) incorporated in ships, and therefore already counted in Table 1, col. 6 (and, in the case of replacement equipment, col. 7). In the case of merchant steamships, one can with some confidence allow .1 tons of propulsion and other machinery per gross ton built (Fenoaltea 2015F, section F02.03); assuming negligible replacement use, and that imported ships were fully outfitted, the estimated annual tonnage of merchant-ship machinery acquired transcribed in Table A1, col. 5 is derived as the estimated gross tonnage built (Fenoaltea 2018b, Table 5, col. 5) times .1 tons per gross ton. Table A1, col. 6 transcribes the estimates of the machinery (including weapons) incorporated in new naval ships; for simplicity, it is obtained as the sum of the type-specific deadweight-tonnages-constructed series in Fenoaltea (2015F), Table F.16, cols. 1−13, variously weighted, as suggested by sample data (ibid., Table F.17), by .03 (cols. 12−13), .1 (cols. 1−2 and 11), .2 (cols. 3−5), .3 (cols. 8 and 10), .4 (col. 6), .5 (col. 7), and .6 (col. 9). Table A1, col. 7 transcribes the estimates of the machinery (including weapons) incorporated in existing naval ships, as they were maintained and progressively improved. For simplicity these figures are obtained as the estimated tonnage of metal-hulled naval vessels maintained (ibid., Table F.23, col. 11), times .2 (the rough overall average for new ships) divided by 20 (the assumed life, in years, of the equipment). Col. 8 is the investment tonnage in col. 4, less the sum of the shipboard machinery in cols. 5−7; it is the estimated investment in agricultural and industrial machinery, measured in tons. Those tonnages are then assigned a unit value of 1,300 lire (ibid., section F04.06); the resulting 1911-price value series is transcribed in Table 1, col. 12.

Table 1, col. 13 (investment in new precision instruments) is also derived in Table A1. For simplicity, the aggregate tonnage consumed is estimated as production plus net imports (Fenoaltea 2017b, Table 1, col. 5 plus Table 2, col. 4), and the consumer-good component is simply neglected; these figures appear in Table A1, col. 9. Table A1, col. 10 transcribes the estimated shipborne tonnage; grasping at straws, it is estimated as 3.5 percent of the merchant marine's general equipment tonnage (Table A1, col. 5) plus 7.5 percent of the navy's (Table A1, cols. 6 plus 7). Table 1, col. 13 is the residual tonnage (Table A1, col. 9 less col. 10), valued at 22,000 lire per ton (Fenoaltea 2015F, section F04.06).

Table 1, col. 14 (investment in new precious-metalware) is a crude estimate. Again neglecting the value of the raw materials to avoid dealing with changes in the related inventories of metal, these figures are simply estimated total value added (ibid., Summary Table F.3, col. 19) less the estimated consumer-good component (Fenoaltea 2018a, Table A5, col. 7).

Col. 15 (investment in new fabricated-metal products, gross of those already included in the investment series for structures, ships, etc.) is estimated as the aggregate tonnage produced and imported (Fenoaltea 2017b, Table 1, col. 1, Table 2, col. 1), valued at 810 lire per ton (Fenoaltea 2015F, section F04.06), less the implied value of the estimated consumer-good component (the value added figures in Fenoaltea 2018a, Table A5, col. 2, divided by 415/810).

Col. 16 (investment in new wood products, again gross of those already included in other investment series) simply transcribes the value estimates in Fenoaltea (2018a), Table A4, col. 1.

Col. 17 (the estimated aggregate investment value added of the services group) simply transcribes the extant value added estimates (ibid., Table A10, col. 5).

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Figure 1. Approximate index of the ratio of distribution costs to production costs, 1861-1913, at 1911 prices

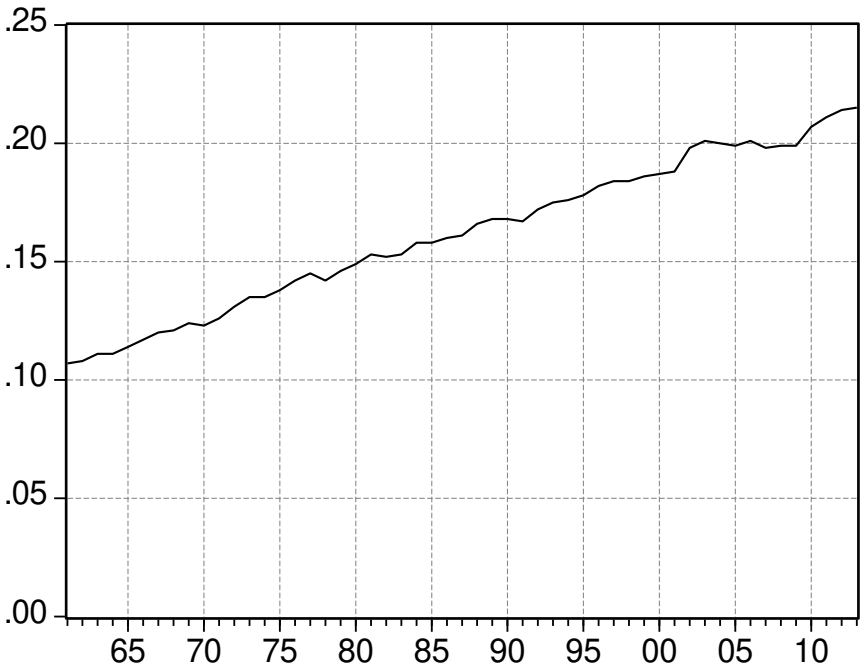
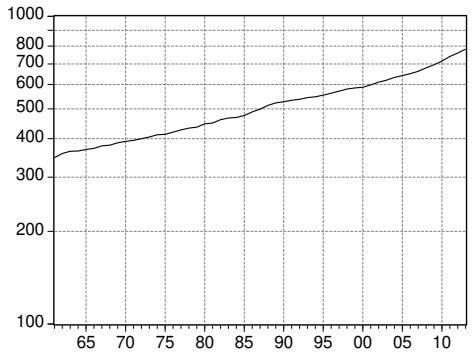


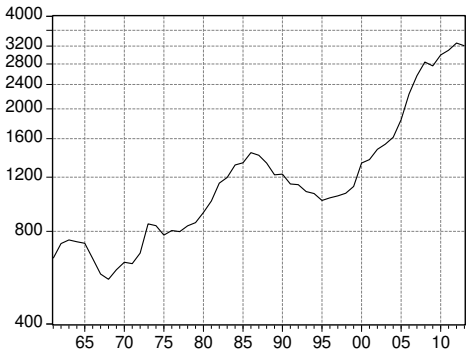
Figure 2. The components of fixed investment at 1911 prices, 1861-1913 (million lire)

A. Aggregate investment

A1. Maintenance

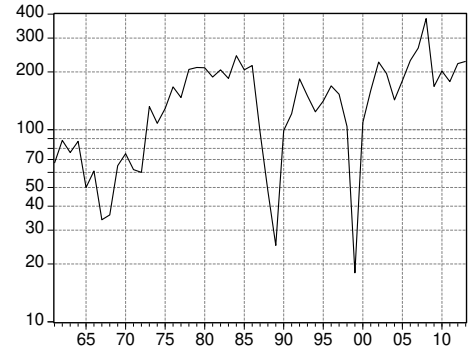



A2. New-good investment

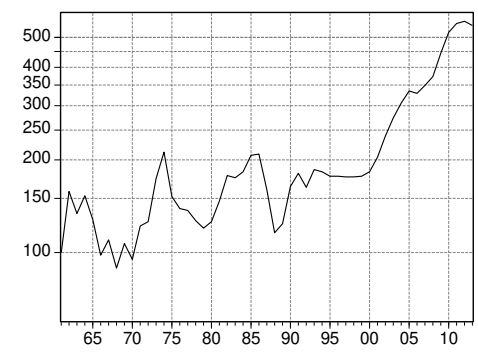



B. New-good investment

B1. By and in agriculture, off-farm horses




B2. Private structures




B3. Other infrastructure


B4. Ships, railway rolling stock

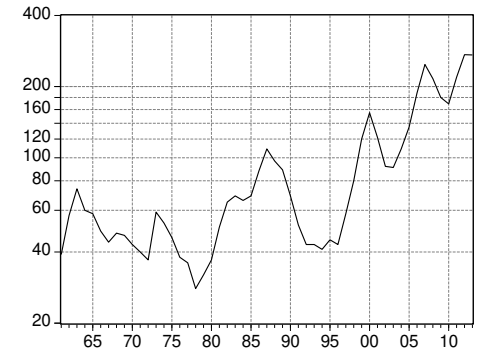
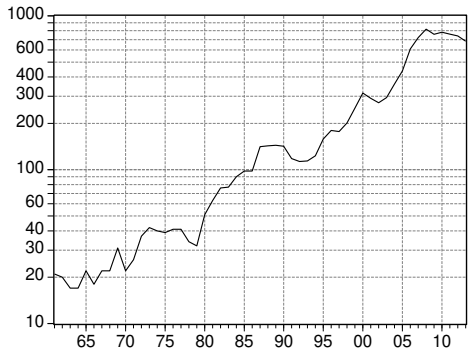
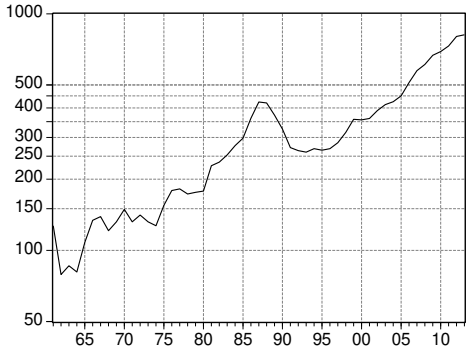


Figure 2, continued

B5. Metal (ordinary, precision) machinery




B6. Tools, wood machinery




B7. Precious-metalware

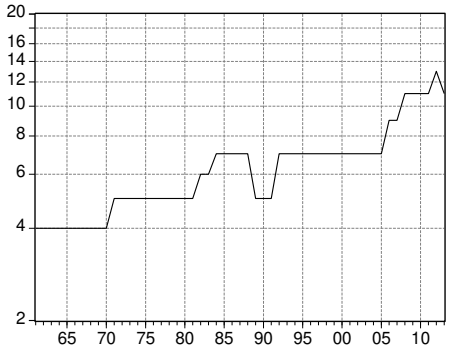
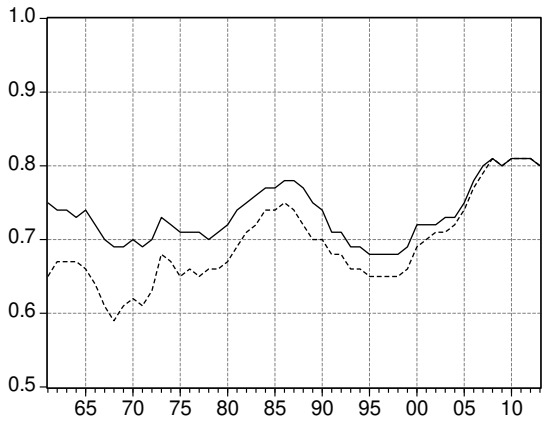


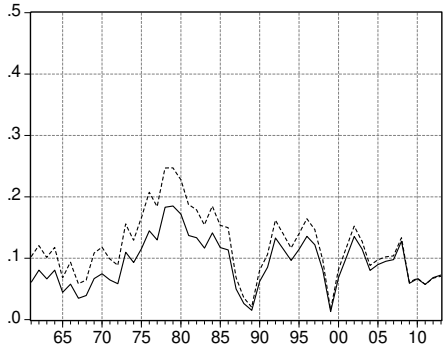
Figure 3. The composition of investment, 1861-1913

A. Share of new-product investment in aggregate investment

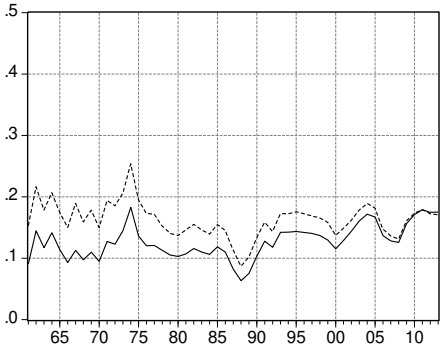



B. Shares of new-product investment

B1. By and in agriculture, off-farm horses




B2. Private structures




B3. Other infrastructure, ships, rolling stock


B4. Metal (ordinary, precision) machinery

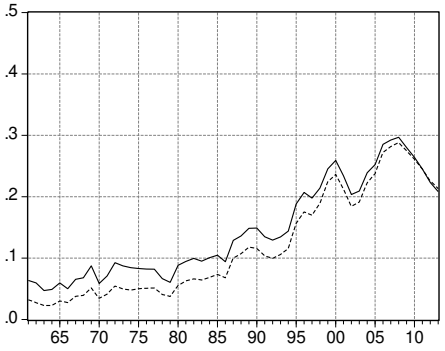
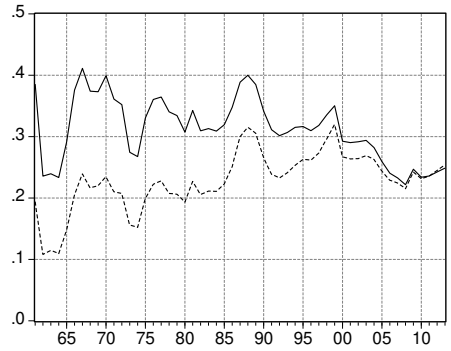
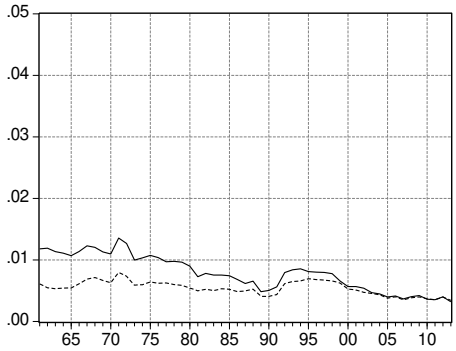


Figure 3, continued

B5. Tools, wood machinery

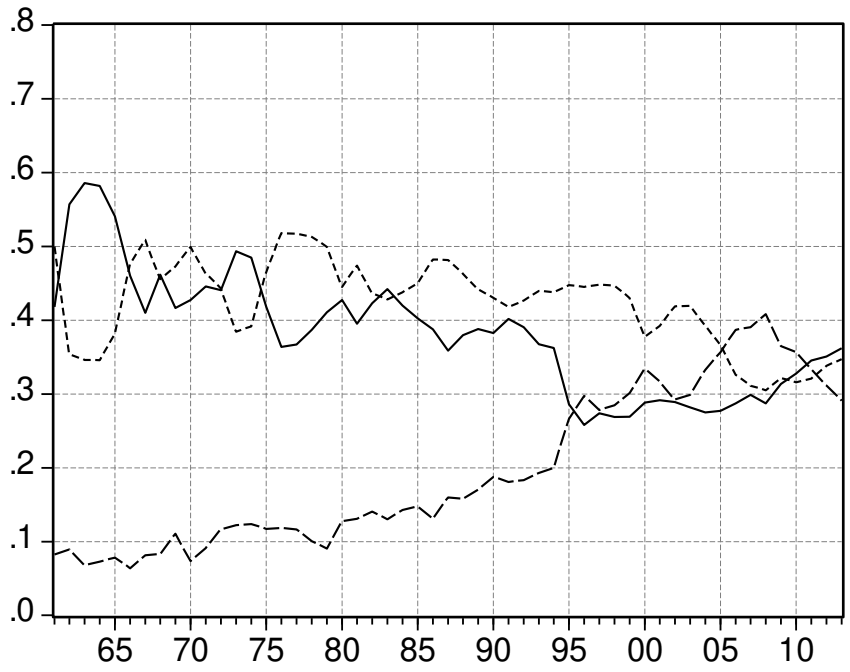



B6. Precious-metalware




——— share at approximate current prices -------- share at 1911 prices

Figure 4. The relative shares of productivity-enhancing investment, 1861-1913




——— public infrastructure, merchant ships, rolling stock
-------- tools, wood machinery
— — — metal (ordinary, precision) machinery

Table 1. Extant investment series, 1861-1913 (million lire at 1911 prices)

| | (1) total fixed | (2) by and in agr. | (3) construction new | (4) construction maint. | (5) off-farm horses | (6) ships new | (7) ships maint. | (8) railway veh.s new | (9) railway veh.s maint. |
|---|---|---|---|---|---|---|---|---|---|
| 1861 | 1,001 | 51 | 396 | 162 | 11 | 32 | 10 | 7 | 2 |
| 1862 | 1,088 | 72 | 482 | 170 | 11 | 46 | 11 | 11 | 3 |
| 1863 | 1,114 | 62 | 492 | 174 | 10 | 59 | 11 | 15 | 4 |
| 1864 | 1,105 | 73 | 490 | 174 | 10 | 49 | 11 | 11 | 4 |
| 1865 | 1,101 | 35 | 490 | 175 | 10 | 47 | 11 | 11 | 5 |
| 1866 | 1,025 | 54 | 387 | 175 | 5 | 39 | 12 | 10 | 5 |
| 1867 | 960 | 24 | 337 | 180 | 7 | 37 | 13 | 7 | 5 |
| 1868 | 940 | 24 | 327 | 178 | 8 | 40 | 14 | 8 | 6 |
| 1869 | 988 | 52 | 320 | 180 | 9 | 39 | 16 | 8 | 7 |
| 1870 | 1,027 | 62 | 341 | 181 | 9 | 36 | 17 | 7 | 8 |
| 1871 | 1,023 | 47 | 364 | 183 | 10 | 28 | 17 | 12 | 8 |
| 1872 | 1,080 | 43 | 401 | 185 | 11 | 24 | 17 | 13 | 10 |
| 1873 | 1,251 | 114 | 476 | 186 | 12 | 38 | 17 | 21 | 11 |
| 1874 | 1,247 | 91 | 502 | 192 | 11 | 40 | 17 | 13 | 11 |
| 1875 | 1,191 | 120 | 404 | 190 | 6 | 39 | 18 | 7 | 12 |
| 1876 | 1,225 | 154 | 376 | 193 | 8 | 32 | 18 | 6 | 13 |
| 1877 | 1,225 | 122 | 387 | 199 | 16 | 29 | 18 | 7 | 13 |
| 1878 | 1,267 | 192 | 388 | 202 | 9 | 24 | 18 | 4 | 13 |
| 1879 | 1,290 | 195 | 399 | 202 | 10 | 25 | 19 | 7 | 14 |
| 1880 | 1,368 | 191 | 440 | 208 | 12 | 22 | 19 | 15 | 16 |
| 1881 | 1,454 | 167 | 469 | 208 | 13 | 31 | 19 | 20 | 17 |
| 1882 | 1,608 | 181 | 559 | 215 | 15 | 39 | 20 | 26 | 18 |
| 1883 | 1,664 | 162 | 607 | 216 | 14 | 41 | 20 | 28 | 20 |
| 1884 | 1,783 | 220 | 632 | 215 | 14 | 47 | 20 | 19 | 22 |
| 1885 | 1,812 | 181 | 659 | 218 | 15 | 50 | 21 | 19 | 22 |
| 1886 | 1,931 | 191 | 671 | 227 | 15 | 64 | 21 | 24 | 24 |
| 1887 | 1,912 | 74 | 635 | 232 | 14 | 69 | 21 | 40 | 26 |
| 1888 | 1,846 | 31 | 619 | 239 | 10 | 50 | 22 | 47 | 29 |
| 1889 | 1,744 | 3 | 585 | 245 | 13 | 42 | 23 | 47 | 30 |
| 1890 | 1,754 | 77 | 586 | 246 | 13 | 47 | 23 | 22 | 31 |
| 1891 | 1,673 | 101 | 572 | 248 | 12 | 44 | 25 | 8 | 31 |
| 1892 | 1,672 | 164 | 524 | 249 | 12 | 36 | 26 | 7 | 31 |
| 1893 | 1,621 | 128 | 503 | 252 | 13 | 37 | 28 | 6 | 32 |
| 1894 | 1,609 | 104 | 498 | 251 | 12 | 32 | 29 | 9 | 33 |
| 1895 | 1,562 | 122 | 393 | 254 | 11 | 35 | 30 | 10 | 34 |
| 1896 | 1,590 | 148 | 361 | 259 | 12 | 32 | 30 | 11 | 35 |
| 1897 | 1,614 | 129 | 363 | 263 | 14 | 43 | 32 | 15 | 37 |
| 1898 | 1,644 | 80 | 356 | 266 | 14 | 57 | 33 | 23 | 39 |
| 1899 | 1,704 | -8 | 365 | 266 | 15 | 90 | 34 | 30 | 41 |
| 1900 | 1,921 | 83 | 391 | 262 | 15 | 108 | 37 | 47 | 43 |
| 1901 | 1,967 | 132 | 428 | 265 | 16 | 73 | 40 | 49 | 45 |
| 1902 | 2,088 | 193 | 490 | 271 | 18 | 57 | 41 | 35 | 48 |
| 1903 | 2,155 | 164 | 533 | 275 | 18 | 50 | 40 | 41 | 51 |
| 1904 | 2,251 | 111 | 573 | 281 | 18 | 62 | 40 | 47 | 54 |
| 1905 | 2,486 | 142 | 635 | 285 | 21 | 88 | 39 | 47 | 56 |
| 1906 | 2,887 | 189 | 690 | 284 | 22 | 99 | 41 | 89 | 61 |
| 1907 | 3,224 | 228 | 742 | 286 | 21 | 99 | 42 | 149 | 63 |
| 1908 | 3,521 | 338 | 805 | 292 | 23 | 84 | 44 | 132 | 69 |
| 1909 | 3,453 | 118 | 973 | 298 | 28 | 79 | 46 | 101 | 73 |
| 1910 | 3,708 | 147 | 1,137 | 309 | 30 | 91 | 47 | 78 | 78 |
| 1911 | 3,840 | 130 | 1,201 | 324 | 26 | 126 | 48 | 93 | 82 |
| 1912 | 4,032 | 171 | 1,225 | 330 | 27 | 177 | 52 | 96 | 87 |
| 1913 | 3,988 | 180 | 1,199 | 338 | 25 | 188 | 58 | 84 | 92 |

Table 1, continued

| | (10) fab. met. maint. | (11) equip. maint. | (12) mach. new | (13) instr. new | (14) precious metalw. | (15) fab. met. new[a] | (16) wood prod.s[a] | (17) services[a] |
|---|---|---|---|---|---|---|---|---|
| 1861 | 171 | 2 | 11 | 4 | 3 | *24* | *134* | *104* |
| 1862 | 172 | 2 | 10 | 4 | 3 | *29* | *114* | *115* |
| 1863 | 173 | 2 | 8 | 4 | 3 | *27* | *110* | *121* |
| 1864 | 174 | 2 | 6 | 6 | 3 | *30* | *110* | *120* |
| 1865 | 175 | 3 | 11 | 4 | 3 | *27* | *135* | *126* |
| 1866 | 177 | 3 | 8 | 4 | 3 | *23* | *146* | *117* |
| 1867 | 178 | 3 | 11 | 4 | 3 | *26* | *138* | *114* |
| 1868 | 180 | 3 | 11 | 4 | 3 | *28* | *113* | *112* |
| 1869 | 181 | 4 | 16 | 5 | 3 | *31* | *118* | *116* |
| 1870 | 182 | 4 | 12 | 3 | 3 | *37* | *126* | *119* |
| 1871 | 183 | 4 | 13 | 4 | 3 | *34* | *118* | *124* |
| 1872 | 184 | 4 | 18 | 6 | 3 | *35* | *122* | *135* |
| 1873 | 186 | 5 | 22 | 5 | 3 | *32* | *123* | *154* |
| 1874 | 187 | 5 | 22 | 4 | 3 | *36* | *119* | *157* |
| 1875 | 188 | 5 | 20 | 5 | 3 | *42* | *122* | *146* |
| 1876 | 190 | 6 | 21 | 5 | 3 | *41* | *135* | *149* |
| 1877 | 191 | 6 | 21 | 5 | 3 | *40* | *135* | *155* |
| 1878 | 193 | 7 | 19 | 3 | 3 | *37* | *135* | *150* |
| 1879 | 194 | 7 | 18 | 2 | 3 | *38* | *122* | *155* |
| 1880 | 196 | 8 | 28 | 4 | 3 | *49* | *118* | *170* |
| 1881 | 197 | 9 | 35 | 4 | 3 | *62* | *131* | *186* |
| 1882 | 198 | 10 | 43 | 4 | 4 | *78* | *135* | *208* |
| 1883 | 200 | 11 | 44 | 4 | 4 | *93* | *135* | *220* |
| 1884 | 201 | 11 | 50 | 5 | 4 | *104* | *148* | *235* |
| 1885 | 203 | 12 | 56 | 4 | 4 | *111* | *164* | *246* |
| 1886 | 204 | 13 | 54 | 6 | 4 | *129* | *190* | *264* |
| 1887 | 206 | 14 | 66 | 20 | 4 | *154* | *197* | *273* |
| 1888 | 208 | 15 | 70 | 16 | 4 | *166* | *177* | *277* |
| 1889 | 209 | 16 | 75 | 11 | 3 | *154* | *152* | *270* |
| 1890 | 211 | 16 | 77 | 8 | 3 | *126* | *152* | *263* |
| 1891 | 213 | 16 | 67 | 4 | 3 | *92* | *152* | *248* |
| 1892 | 214 | 17 | 63 | 4 | 4 | *69* | *148* | *242* |
| 1893 | 215 | 17 | 63 | 4 | 4 | *62* | *148* | *242* |
| 1894 | 217 | 17 | 71 | 1 | 4 | *61* | *151* | *244* |
| 1895 | 219 | 17 | 91 | 1 | 4 | *61* | *156* | *234* |
| 1896 | 221 | 17 | 101 | 3 | 4 | *55* | *168* | *238* |
| 1897 | 222 | 17 | 96 | 6 | 4 | *51* | *177* | *247* |
| 1898 | 224 | 18 | 104 | 12 | 4 | *54* | *193* | *257* |
| 1899 | 226 | 18 | 134 | 10 | 4 | *67* | *209* | *280* |
| 1900 | 228 | 18 | 168 | 12 | 4 | *78* | *202* | *302* |
| 1901 | 230 | 18 | 150 | 16 | 4 | *78* | *214* | *306* |
| 1902 | 232 | 19 | 136 | 16 | 4 | *73* | *222* | *329* |
| 1903 | 234 | 20 | 145 | 18 | 4 | *81* | *235* | *350* |
| 1904 | 236 | 22 | 178 | 22 | 4 | *93* | *240* | *374* |
| 1905 | 238 | 23 | 218 | 26 | 4 | *105* | *261* | *407* |
| 1906 | 240 | 25 | 290 | 47 | 5 | *135* | *269* | *462* |
| 1907 | 243 | 28 | 350 | 53 | 5 | *185* | *286* | *505* |
| 1908 | 245 | 30 | 392 | 64 | 6 | *236* | *312* | *545* |
| 1909 | 247 | 31 | 364 | 58 | 6 | *272* | *337* | *581* |
| 1910 | 250 | 31 | 361 | 67 | 6 | *277* | *346* | *642* |
| 1911 | 253 | 33 | 346 | 66 | 6 | *291* | *334* | *681* |
| 1912 | 256 | 34 | 330 | 68 | 7 | *299* | *318* | *707* |
| 1913 | 259 | 35 | 299 | 68 | 6 | *300* | *313* | *703* |

[a]gross of elements in cols. 3-7.

Source: see text.

Table 2. Derivative investment-related series, 1861-1913

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | ratio of T.1, col.17 to T.1, sum of cols. 3 through 16 | investment (million lire at 1911 c.i.f. prices) net, not identified | in identified mobile goods | in fabricated metal and wood products gross | net | ratio of col. 5 to col. 4 |
| 1861 | .107 | 139 | 41 | 226 | 127 | .56 |
| 1862 | .108 | 91 | 40 | 205 | 79 | .39 |
| 1863 | .111 | 97 | 36 | 198 | 86 | .43 |
| 1864 | .111 | 92 | 36 | 202 | 81 | .40 |
| 1865 | .114 | 121 | 41 | 236 | 108 | .46 |
| 1866 | .117 | 143 | 29 | 248 | 134 | .54 |
| 1867 | .120 | 151 | 37 | 243 | 139 | .57 |
| 1868 | .121 | 134 | 39 | 209 | 121 | .58 |
| 1869 | .124 | 148 | 49 | 223 | 132 | .59 |
| 1870 | .123 | 162 | 40 | 243 | 149 | .61 |
| 1871 | .126 | 147 | 45 | 229 | 132 | .58 |
| 1872 | .131 | 161 | 58 | 239 | 141 | .59 |
| 1873 | .135 | 155 | 65 | 239 | 132 | .55 |
| 1874 | .135 | 149 | 62 | 239 | 127 | .53 |
| 1875 | .138 | 174 | 53 | 255 | 155 | .61 |
| 1876 | .142 | 200 | 58 | 276 | 179 | .65 |
| 1877 | .145 | 208 | 71 | 277 | 182 | .66 |
| 1878 | .142 | 192 | 53 | 270 | 173 | .64 |
| 1879 | .146 | 195 | 52 | 253 | 176 | .70 |
| 1880 | .149 | 206 | 75 | 267 | 178 | .67 |
| 1881 | .153 | 262 | 89 | 311 | 228 | .73 |
| 1882 | .152 | 276 | 106 | 343 | 236 | .69 |
| 1883 | .153 | 293 | 106 | 368 | 253 | .69 |
| 1884 | .158 | 323 | 119 | 411 | 277 | .67 |
| 1885 | .158 | 348 | 129 | 449 | 298 | .66 |
| 1886 | .160 | 413 | 130 | 523 | 362 | .69 |
| 1887 | .161 | 491 | 171 | 577 | 424 | .73 |
| 1888 | .166 | 486 | 166 | 571 | 420 | .74 |
| 1889 | .168 | 442 | 171 | 512 | 373 | .73 |
| 1890 | .168 | 394 | 169 | 465 | 326 | .70 |
| 1891 | .167 | 329 | 143 | 407 | 272 | .67 |
| 1892 | .172 | 321 | 140 | 366 | 264 | .72 |
| 1893 | .175 | 319 | 143 | 357 | 260 | .73 |
| 1894 | .176 | 331 | 150 | 361 | 269 | .75 |
| 1895 | .178 | 341 | 183 | 372 | 265 | .71 |
| 1896 | .182 | 356 | 207 | 385 | 269 | .70 |
| 1897 | .184 | 373 | 208 | 396 | 285 | .72 |
| 1898 | .184 | 414 | 233 | 429 | 315 | .73 |
| 1899 | .186 | 479 | 284 | 481 | 358 | .74 |
| 1900 | .187 | 505 | 348 | 489 | 356 | .73 |
| 1901 | .188 | 501 | 326 | 512 | 361 | .71 |
| 1902 | .198 | 528 | 312 | 529 | 390 | .74 |
| 1903 | .201 | 562 | 334 | 570 | 413 | .72 |
| 1904 | .200 | 603 | 400 | 599 | 425 | .71 |
| 1905 | .199 | 664 | 483 | 657 | 450 | .68 |
| 1906 | .201 | 805 | 657 | 729 | 512 | .70 |
| 1907 | .198 | 915 | 769 | 844 | 575 | .68 |
| 1908 | .199 | 997 | 871 | 984 | 611 | .62 |
| 1909 | .199 | 1,031 | 819 | 1,094 | 668 | .61 |
| 1910 | .207 | 1,076 | 848 | 1,139 | 692 | .61 |
| 1911 | .211 | 1,106 | 819 | 1,153 | 731 | .63 |
| 1912 | .214 | 1,172 | 802 | 1,145 | 802 | .70 |
| 1913 | .215 | 1,157 | 740 | 1,140 | 815 | .71 |

Source: see text.

Table 3. Summary investment estimates, 1861-1913 (million lire at 1911 c.i.f. prices)

| | (1) inv. in main-tenance | (2) investment in new durable goods: total | (3) ag. fields, animals | (4) construction: priv. | (5) construction: pub. | (6) ships, rr. vehs. | (7) metal mach. | (8) tools, wood mach. | (9) display goods |
|---|---|---|---|---|---|---|---|---|---|
| 1861 | 347 | 654 | 67 | 100 | 296 | 39 | 21 | 127 | 4 |
| 1862 | 358 | 730 | 88 | 158 | 324 | 57 | 20 | 79 | 4 |
| 1863 | 364 | 750 | 76 | 134 | 358 | 74 | 17 | 86 | 4 |
| 1864 | 365 | 740 | 87 | 153 | 337 | 60 | 17 | 81 | 4 |
| 1865 | 369 | 732 | 50 | 128 | 362 | 58 | 22 | 108 | 4 |
| 1866 | 372 | 653 | 61 | 98 | 289 | 49 | 18 | 134 | 4 |
| 1867 | 379 | 581 | 34 | 110 | 227 | 44 | 22 | 139 | 4 |
| 1868 | 381 | 559 | 36 | 89 | 238 | 48 | 22 | 121 | 4 |
| 1869 | 388 | 600 | 65 | 107 | 213 | 47 | 31 | 132 | 4 |
| 1870 | 392 | 635 | 75 | 95 | 246 | 43 | 22 | 149 | 4 |
| 1871 | 395 | 628 | 62 | 122 | 242 | 40 | 26 | 132 | 5 |
| 1872 | 400 | 680 | 60 | 126 | 275 | 37 | 37 | 141 | 5 |
| 1873 | 405 | 846 | 132 | 174 | 302 | 59 | 42 | 132 | 5 |
| 1874 | 412 | 835 | 108 | 212 | 290 | 53 | 40 | 127 | 5 |
| 1875 | 413 | 778 | 129 | 152 | 252 | 46 | 39 | 155 | 5 |
| 1876 | 420 | 805 | 167 | 139 | 237 | 38 | 41 | 179 | 5 |
| 1877 | 427 | 798 | 147 | 137 | 250 | 36 | 41 | 182 | 5 |
| 1878 | 433 | 834 | 206 | 127 | 261 | 28 | 34 | 173 | 5 |
| 1879 | 436 | 854 | 211 | 120 | 279 | 32 | 32 | 176 | 5 |
| 1880 | 447 | 921 | 210 | 126 | 314 | 37 | 51 | 178 | 5 |
| 1881 | 450 | 1,004 | 188 | 147 | 322 | 51 | 63 | 228 | 5 |
| 1882 | 461 | 1,147 | 205 | 178 | 381 | 65 | 76 | 236 | 6 |
| 1883 | 467 | 1,197 | 185 | 175 | 432 | 69 | 77 | 253 | 6 |
| 1884 | 469 | 1,314 | 243 | 183 | 449 | 66 | 90 | 277 | 7 |
| 1885 | 476 | 1,336 | 205 | 207 | 452 | 69 | 98 | 298 | 7 |
| 1886 | 489 | 1,442 | 216 | 209 | 462 | 88 | 98 | 362 | 7 |
| 1887 | 499 | 1,413 | 97 | 160 | 475 | 109 | 141 | 424 | 7 |
| 1888 | 513 | 1,333 | 48 | 116 | 503 | 97 | 143 | 420 | 7 |
| 1889 | 523 | 1,221 | 25 | 124 | 461 | 89 | 144 | 373 | 5 |
| 1890 | 527 | 1,227 | 99 | 164 | 422 | 69 | 142 | 326 | 5 |
| 1891 | 533 | 1,140 | 121 | 181 | 391 | 52 | 118 | 272 | 5 |
| 1892 | 537 | 1,135 | 184 | 163 | 361 | 43 | 113 | 264 | 7 |
| 1893 | 544 | 1,077 | 150 | 186 | 317 | 43 | 114 | 260 | 7 |
| 1894 | 547 | 1,062 | 124 | 183 | 315 | 41 | 123 | 269 | 7 |
| 1895 | 554 | 1,008 | 141 | 177 | 216 | 45 | 158 | 265 | 7 |
| 1896 | 562 | 1,028 | 169 | 177 | 184 | 43 | 180 | 269 | 7 |
| 1897 | 571 | 1,043 | 153 | 176 | 187 | 58 | 177 | 285 | 7 |
| 1898 | 580 | 1,064 | 104 | 176 | 180 | 80 | 201 | 315 | 7 |
| 1899 | 585 | 1,119 | 18 | 177 | 188 | 120 | 251 | 358 | 7 |
| 1900 | 588 | 1,333 | 109 | 183 | 208 | 155 | 315 | 356 | 7 |
| 1901 | 598 | 1,369 | 160 | 204 | 224 | 122 | 291 | 361 | 7 |
| 1902 | 611 | 1,477 | 225 | 239 | 251 | 92 | 272 | 390 | 7 |
| 1903 | 620 | 1,535 | 196 | 274 | 259 | 91 | 294 | 413 | 7 |
| 1904 | 633 | 1,618 | 143 | 306 | 267 | 109 | 360 | 425 | 7 |
| 1905 | 641 | 1,845 | 180 | 335 | 300 | 135 | 438 | 450 | 7 |
| 1906 | 651 | 2,236 | 229 | 329 | 361 | 188 | 608 | 512 | 9 |
| 1907 | 662 | 2,562 | 266 | 349 | 393 | 248 | 722 | 575 | 9 |
| 1908 | 680 | 2,841 | 379 | 373 | 432 | 216 | 819 | 611 | 11 |
| 1909 | 695 | 2,758 | 168 | 444 | 529 | 180 | 758 | 668 | 11 |
| 1910 | 715 | 2,993 | 202 | 519 | 618 | 169 | 782 | 692 | 11 |
| 1911 | 740 | 3,100 | 178 | 555 | 646 | 219 | 760 | 731 | 11 |
| 1912 | 759 | 3,273 | 221 | 564 | 661 | 273 | 739 | 802 | 13 |
| 1913 | 782 | 3,206 | 227 | 547 | 652 | 272 | 683 | 815 | 11 |

Source: see text.

Table 4. Approximate investment estimates, 1861-1913 (million lire at the 1911 price level)

| | (1) inv. in main-tenance | (2) investment in new durable goods | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | total | ag. fields, animals | construction priv. | construction pub. | ships, rr. vehs. | metal mach. | tools, wood mach. | display goods |
| 1861 | 375 | 1,100 | 67 | 100 | 296 | 130 | 70 | 424 | 13 |
| 1862 | 390 | 1,091 | 88 | 158 | 324 | 186 | 65 | 257 | 13 |
| 1863 | 397 | 1,144 | 76 | 134 | 358 | 235 | 54 | 274 | 13 |
| 1864 | 397 | 1,080 | 87 | 153 | 337 | 186 | 53 | 252 | 12 |
| 1865 | 401 | 1,122 | 50 | 128 | 362 | 176 | 67 | 327 | 12 |
| 1866 | 405 | 1,054 | 61 | 98 | 289 | 145 | 53 | 396 | 12 |
| 1867 | 413 | 975 | 34 | 110 | 227 | 127 | 64 | 401 | 12 |
| 1868 | 417 | 912 | 36 | 89 | 238 | 135 | 62 | 341 | 11 |
| 1869 | 428 | 973 | 65 | 107 | 213 | 129 | 85 | 363 | 11 |
| 1870 | 434 | 1,002 | 75 | 95 | 246 | 116 | 59 | 400 | 11 |
| 1871 | 436 | 958 | 62 | 122 | 242 | 105 | 68 | 346 | 13 |
| 1872 | 442 | 1,025 | 60 | 126 | 275 | 95 | 95 | 361 | 13 |
| 1873 | 447 | 1,202 | 132 | 174 | 302 | 147 | 105 | 330 | 12 |
| 1874 | 452 | 1,159 | 108 | 212 | 290 | 129 | 98 | 310 | 12 |
| 1875 | 454 | 1,117 | 129 | 152 | 252 | 110 | 93 | 369 | 12 |
| 1876 | 461 | 1,154 | 167 | 139 | 237 | 88 | 95 | 416 | 12 |
| 1877 | 466 | 1,133 | 147 | 137 | 250 | 82 | 93 | 413 | 11 |
| 1878 | 471 | 1,125 | 206 | 127 | 261 | 62 | 75 | 383 | 11 |
| 1879 | 474 | 1,140 | 211 | 120 | 279 | 69 | 69 | 381 | 11 |
| 1880 | 486 | 1,223 | 210 | 126 | 314 | 78 | 108 | 376 | 11 |
| 1881 | 488 | 1,372 | 188 | 147 | 322 | 105 | 130 | 470 | 10 |
| 1882 | 499 | 1,535 | 205 | 178 | 381 | 131 | 153 | 475 | 12 |
| 1883 | 506 | 1,588 | 185 | 175 | 432 | 136 | 151 | 497 | 12 |
| 1884 | 508 | 1,719 | 243 | 183 | 449 | 127 | 173 | 531 | 13 |
| 1885 | 513 | 1,747 | 205 | 207 | 452 | 129 | 183 | 558 | 13 |
| 1886 | 526 | 1,901 | 216 | 209 | 462 | 161 | 179 | 661 | 13 |
| 1887 | 536 | 1,945 | 97 | 160 | 475 | 194 | 251 | 756 | 12 |
| 1888 | 551 | 1,828 | 48 | 116 | 503 | 169 | 249 | 731 | 12 |
| 1889 | 560 | 1,648 | 25 | 124 | 461 | 151 | 245 | 634 | 8 |
| 1890 | 563 | 1,584 | 99 | 164 | 422 | 114 | 236 | 541 | 8 |
| 1891 | 568 | 1,417 | 121 | 181 | 391 | 84 | 191 | 441 | 8 |
| 1892 | 570 | 1,383 | 184 | 163 | 361 | 68 | 179 | 417 | 11 |
| 1893 | 577 | 1,307 | 150 | 186 | 317 | 66 | 176 | 401 | 11 |
| 1894 | 578 | 1,285 | 124 | 183 | 315 | 62 | 185 | 405 | 11 |
| 1895 | 584 | 1,232 | 141 | 177 | 216 | 66 | 232 | 390 | 10 |
| 1896 | 590 | 1,246 | 169 | 177 | 184 | 62 | 258 | 386 | 10 |
| 1897 | 599 | 1,254 | 153 | 176 | 187 | 81 | 248 | 399 | 10 |
| 1898 | 607 | 1,285 | 104 | 176 | 180 | 109 | 275 | 431 | 10 |
| 1899 | 610 | 1,365 | 18 | 177 | 188 | 160 | 335 | 478 | 9 |
| 1900 | 612 | 1,586 | 109 | 183 | 208 | 202 | 411 | 464 | 9 |
| 1901 | 621 | 1,581 | 160 | 204 | 224 | 155 | 370 | 459 | 9 |
| 1902 | 633 | 1,660 | 225 | 239 | 251 | 114 | 338 | 484 | 9 |
| 1903 | 639 | 1,705 | 196 | 274 | 259 | 110 | 357 | 501 | 8 |
| 1904 | 650 | 1,782 | 143 | 306 | 267 | 129 | 426 | 503 | 8 |
| 1905 | 656 | 2,005 | 180 | 335 | 300 | 156 | 506 | 520 | 8 |
| 1906 | 664 | 2,405 | 229 | 329 | 361 | 212 | 686 | 578 | 10 |
| 1907 | 673 | 2,719 | 266 | 349 | 393 | 273 | 795 | 633 | 10 |
| 1908 | 688 | 2,965 | 379 | 373 | 432 | 232 | 880 | 657 | 12 |
| 1909 | 701 | 2,838 | 168 | 444 | 529 | 189 | 795 | 701 | 12 |
| 1910 | 718 | 3,033 | 202 | 519 | 618 | 173 | 801 | 709 | 11 |
| 1911 | 740 | 3,100 | 178 | 555 | 646 | 219 | 760 | 731 | 11 |
| 1912 | 756 | 3,229 | 221 | 564 | 661 | 266 | 721 | 783 | 13 |
| 1913 | 775 | 3,123 | 227 | 547 | 652 | 259 | 651 | 777 | 10 |

Source: see text.

Table A1. Investment-good machinery series, 1861-1913 (thousand tons)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | general equipment | | | | | | | | precision equipment | |
| | gross purchases | motor vehicles | bicycles | investment goods | ship machinery: merchant vessels | ship machinery: naval vessels new | ship machinery: naval vessels maint. | net inv't goods | total purchases | purch'd for ships |
| 1861 | 8.69 | .00 | .00 | 8.69 | .00 | .50 | .06 | 8.13 | .220 | .042 |
| 1862 | 8.59 | .00 | .00 | 8.59 | .00 | .54 | .07 | 7.98 | .220 | .046 |
| 1863 | 7.05 | .00 | .00 | 7.05 | .02 | .70 | .07 | 6.26 | .233 | .058 |
| 1864 | 5.28 | .00 | .00 | 5.28 | .02 | .72 | .07 | 4.47 | .338 | .060 |
| 1865 | 9.63 | .00 | .00 | 9.63 | .04 | .80 | .08 | 8.71 | .271 | .067 |
| 1866 | 7.03 | .00 | .00 | 7.03 | .07 | .75 | .09 | 6.12 | .225 | .065 |
| 1867 | 9.37 | .00 | .00 | 9.37 | .04 | .72 | .10 | 8.51 | .251 | .063 |
| 1868 | 9.12 | .00 | .00 | 9.12 | .07 | .70 | .13 | 8.22 | .232 | .065 |
| 1869 | 12.89 | .00 | .00 | 12.89 | .20 | .58 | .18 | 11.93 | .280 | .064 |
| 1870 | 9.99 | .00 | .00 | 9.99 | .14 | .48 | .23 | 9.14 | .206 | .058 |
| 1871 | 10.26 | .00 | .00 | 10.26 | .02 | .33 | .27 | 9.64 | .225 | .046 |
| 1872 | 14.53 | .00 | .00 | 14.53 | .02 | .25 | .29 | 13.97 | .316 | .041 |
| 1873 | 18.34 | .00 | .00 | 18.34 | .26 | .80 | .29 | 16.99 | .332 | .091 |
| 1874 | 18.45 | .00 | .00 | 18.45 | .35 | 1.26 | .29 | 16.55 | .314 | .129 |
| 1875 | 16.93 | .00 | .00 | 16.93 | .12 | 1.18 | .29 | 15.34 | .348 | .114 |
| 1876 | 17.60 | .00 | .00 | 17.60 | .02 | 1.34 | .29 | 15.95 | .330 | .123 |
| 1877 | 17.95 | .00 | .00 | 17.95 | .02 | 1.61 | .29 | 16.03 | .361 | .143 |
| 1878 | 16.23 | .00 | .00 | 16.23 | .07 | 1.40 | .29 | 14.47 | .281 | .129 |
| 1879 | 15.46 | .00 | .00 | 15.46 | .07 | 1.42 | .29 | 13.68 | .237 | .131 |
| 1880 | 22.70 | .00 | .00 | 22.70 | .05 | 1.19 | .30 | 21.16 | .286 | .114 |
| 1881 | 28.88 | .00 | .00 | 28.88 | .17 | 1.35 | .32 | 27.04 | .312 | .131 |
| 1882 | 35.43 | .00 | .00 | 35.43 | .16 | 1.94 | .33 | 33.00 | .358 | .176 |
| 1883 | 36.50 | .00 | .00 | 36.50 | .16 | 2.06 | .35 | 33.93 | .362 | .186 |
| 1884 | 41.49 | .00 | .00 | 41.49 | .18 | 2.72 | .39 | 38.20 | .453 | .240 |
| 1885 | 46.89 | .00 | .00 | 46.89 | .05 | 3.29 | .44 | 43.11 | .482 | .282 |
| 1886 | 45.99 | .00 | .00 | 45.99 | .03 | 4.21 | .49 | 41.26 | .605 | .354 |
| 1887 | 55.67 | .00 | .00 | 55.67 | .12 | 4.24 | .55 | 50.76 | 1.255 | .363 |
| 1888 | 58.15 | .00 | .00 | 58.15 | .16 | 3.28 | .67 | 54.04 | 1.029 | .302 |
| 1889 | 61.84 | .00 | .00 | 61.84 | .09 | 2.95 | .81 | 57.99 | .792 | .285 |
| 1890 | 64.08 | .00 | .00 | 64.08 | .45 | 3.12 | .95 | 59.56 | .674 | .321 |
| 1891 | 56.49 | .01 | .00 | 56.48 | .60 | 2.93 | 1.10 | 51.85 | .498 | .323 |
| 1892 | 52.66 | .01 | .07 | 52.58 | .24 | 2.81 | 1.28 | 48.25 | .481 | .315 |
| 1893 | 53.42 | .02 | .20 | 53.20 | .19 | 2.82 | 1.46 | 48.73 | .491 | .328 |
| 1894 | 60.05 | .02 | .26 | 59.77 | .32 | 2.87 | 1.59 | 54.99 | .389 | .346 |
| 1895 | 75.11 | .03 | .26 | 74.82 | .52 | 2.95 | 1.68 | 69.67 | .430 | .365 |
| 1896 | 83.67 | .04 | .25 | 83.38 | .94 | 3.22 | 1.76 | 77.46 | .554 | .406 |
| 1897 | 81.31 | .05 | .26 | 81.00 | 1.72 | 3.45 | 1.86 | 73.97 | .723 | .458 |
| 1898 | 88.58 | .07 | .36 | 88.15 | 3.17 | 3.03 | 1.99 | 79.96 | 1.031 | .487 |
| 1899 | 114.41 | .09 | .48 | 113.84 | 5.25 | 3.74 | 2.10 | 102.75 | 1.081 | .622 |
| 1900 | 141.98 | .12 | .42 | 141.44 | 6.05 | 3.69 | 2.15 | 129.55 | 1.191 | .650 |
| 1901 | 125.53 | .16 | .39 | 124.98 | 4.05 | 3.06 | 2.17 | 115.70 | 1.247 | .534 |
| 1902 | 114.33 | .21 | .51 | 113.61 | 2.45 | 4.03 | 2.16 | 104.97 | 1.271 | .550 |
| 1903 | 121.14 | .29 | .62 | 120.23 | 2.28 | 4.44 | 2.13 | 111.38 | 1.407 | .573 |
| 1904 | 147.41 | .38 | .70 | 146.33 | 3.26 | 3.79 | 2.09 | 137.19 | 1.544 | .555 |
| 1905 | 179.50 | .51 | .65 | 178.34 | 3.69 | 5.13 | 2.05 | 167.47 | 1.866 | .668 |
| 1906 | 236.05 | .68 | .76 | 234.61 | 4.11 | 5.45 | 2.01 | 223.04 | 2.826 | .703 |
| 1907 | 282.08 | .90 | 1.03 | 280.15 | 4.02 | 4.91 | 1.97 | 269.25 | 3.071 | .657 |
| 1908 | 312.53 | 1.20 | 1.05 | 310.28 | 2.77 | 4.07 | 1.96 | 301.48 | 3.478 | .549 |
| 1909 | 290.93 | 1.60 | 1.49 | 287.84 | 2.55 | 3.27 | 2.00 | 280.02 | 3.104 | .485 |
| 1910 | 292.32 | 2.14 | 3.32 | 286.86 | 2.02 | 4.92 | 2.06 | 277.86 | 3.633 | .594 |
| 1911 | 285.20 | 2.85 | 4.28 | 278.07 | 2.14 | 7.43 | 2.19 | 266.31 | 3.816 | .796 |
| 1912 | 277.04 | 3.80 | 2.85 | 270.39 | 3.83 | 10.25 | 2.41 | 253.90 | 4.190 | 1.084 |
| 1913 | 254.28 | 5.07 | 2.04 | 247.17 | 4.39 | 9.72 | 2.71 | 230.35 | 4.196 | 1.086 |

Source: see text.