Reconstructing The Past: The New Production-Side Estimates For Italy, 1861–1913

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ABSTRACT

This paper documents the derivation of the revised production-side estimates presented in the author's "Reconstructing the past: Italy's historical national accounts, 1861–1913," *M.P.R.A.* n. 98350, January 2020.

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1. INTRODUCTION

A series of papers revise the Italian historical national accounts from 1861 to 1913. These are to be taken together; the title "Reconstructing the past" is common to all, their subtitles are suitably specific. The first paper (Fenoaltea 2020a) is subtitled "The measurement of aggregate product"; it is devoted to methodological issues of general import, and in no way specific to Italy. The second paper is subtitled "Italy's historical national accounts, 1861–1913" (Fenoaltea 2020b). It presents the latest revised estimates of the production account and the expenditure account, compares them to their predecessors in the literature, and also presents estimates of the composition of investment; it focuses on the results, on their quantitative significance, and provides only a summary description of their derivation. The documentation of the underlying sources and methods – in sufficient detail to allow the estimates' verification, replication, and (one may hope) improvement – is provided in two further papers, essentially appendices to the sections on the new estimates in that second paper (Fenoaltea 2020b, taken as read): the one specifically to its §3.1, on the production side, the other to its §3.2, on the expenditure side, and §3.3, on the composition of investment.

The present paper is the third of the series, it documents the derivation of the production side of the national accounts. The new estimates differ from my immediately preceding ones (in Fenoaltea 2017a), which they supersede, in two ways. On the one hand, they incorporate the first proper ("second-generation") estimates for the leather industry, only recently compiled; on the other, and more generally, they reflects much-clarified thinking on the proper accounting of maintenance activity: that thinking much needed clarification, and the new estimates remove a number of errors and inconsistencies.

The new production-side estimates are presented in Fenoaltea (2020b) in Tables 1, 2, and 3. The first presents the 1911-price value added estimates, disaggregated by sector as in the Italian literature; the second converts the sector aggregates in Table 1 into tentative (*ersatz* "third-generation") estimates that maintain the 1911 *price level*, but reflect current relative prices; the third instead converts the sector aggregates in Table 1 into 1911-price estimates adjusted to fit the accounting conventions of the United Nations' *ISIC*. For convenience these are reproduced here, again as Tables 1, 2, and 3. In Fenoaltea (2020b) Figures 2, 3, and 4 illustrate the new series and compare them to their immediate predecessors, the preliminary second-generation estimates in Fenoaltea (2005) and the sesquicentennial estimates in Baffigi (2011, 2013, 2015, 2017); they are similarly reproduced here as Figures 1, 2, and 3.

The following sections of this paper document the derivation of the new estimates for agriculture (2), industry (3), the services (4), and gross domestic product (5).

2. AGRICULTURE

2.1 Introduction

The two original constant-price estimates of the value added in agriculture are the "centennial" Istat-Vitali series, and the "second-generation" Federico series. The former is a 1938-price value added series (Fuà 1969), transcribed in Fenoaltea (2005), Table 1, col. 2; it is here illustrated in Figure 4, rescaled to interpolate the Istat-Vitali current-price estimate for 1911. The latter was presented as an index of gross saleable production at constant prices and current borders, accompanied by a

current-price series and an implicit deflator (Federico 2003, p. 377). Figure 4 also illustrates the Federico value added series in Fenoaltea (2005), Table 3, col. 1 (see also, Figure 1, panel A); it extrapolates the Federico value added estimate for 1911 in Rey (2000), p. 19 with an index of agriculture's value added at 1911 prices and constant (1871–1913) borders kindly furnished to the present author by Federico himself (Fenoaltea 2005, pp. 285, 306).

That said, the Istat-Vitali "centennial" series and the "second-generation" Federico series have an unfortunate feature in common: neither was accompanied by an adequate description of the underlying sources and methods, so neither can be verified, replicated, or (organically) improved. In other ways, however, they are practically mirror-images. The Istat-Vitali series was compiled by acritically stringing together partial series produced at the time by successively different bodies using different methods; it presumably reflects year-to-year harvest fluctuations when the successive figures are homogeneous, and sheer nonsense when they are not. Federico back-cast the relatively sound production figures available for the last few years of the *belle époque* using reasonable supply and demand functions; his series presumably captures the medium-term movements of production, but not, as he was careful to point out (Federico 2003, p. 369), the year-to-year fluctuations in the harvests. The first correction to the Federico series to be performed here accordingly modifies it, as described below, to incorporate the evidence of harvest fluctuations contained in the Istat-Vitali series.

The further correction is more insidious, and warrants a return to first principles. A productive activity's value added can be indifferently measured as the difference between the value of its product and that of purchased intermediates, or as the sum of the values of the primary resources it consumes. That is true in principle (Fenoaltea 1976; also 2020a, §2.4, footnote 34), and true in practice *if everything is properly counted* – which it tends to be if we measure primary resource values, and tends *not* to be if we measure product-and-purchased-input values. Consider, to clarify the issue, a firm that is opening up a new mine. Over the accounting period it has absorbed capital and labor; from this perspective its value added is clearly positive. If it has yet to extract any ore, however, the conventional sales-less-purchases measure of its value added is zero (or negative, by the value of its purchased materials); and it is the latter measure that is defective, because it overlooks the firm's actual value product, which is the increase in the value of its now more accessible subsoil resources. We conventionally count additions to inventory – goods produced but not sold – as part of a firm's product, and investment; the point is simply that subtler forms of investment deserve equal treatment.

Federico's gross saleable product figures are akin to our hypothetical mining firm's value-of-ore-sold measure of its value product: they include additions to the herds (Federico 2003, footnote 26), but appear to exclude, by construction, any other investment. Quite properly so in most cases, as tool and machinery purchases are counted as the product of the engineering industry, and land-reclamation projects among the construction industry's additions to social overhead capital; but such on-farm improvements as the conversion from pasture or cultivation to tree crops appear nowhere else on the production side. This omission is here made good, if only in principle; pending the necessary basic research, a crude allowance for on-farm improvements is here added to the constant-price value added series for agriculture.[1]

The final, revised estimates of 1911-price value added in agriculture are transcribed in Table 1, col. 1. This series' quality warrants no more than a 2: not so much because the (comparatively trivial) "improvements" component is weak, but because the parent Istat-Vitali and Federico series

[1] Fenoaltea (2017a) included a third "improvement" to the earlier series, a deduction for the maintenance services consumed by agriculture; but that was the result of muddled thinking, since clarified.

cannot be reconstructed and, as necessary, improved.[2] The new, revised estimates are illustrated, next to their parent series, in Figure 4; they are compared to the Baffigi series above, in Figure 1, panel A. The revised estimates are more volatile, and (like the 2005 series) generally higher, than Baffigi's; over the medium term the upward revision grows over the 1870s, remains high over the 1880s, harvest failures aside, and then declines over the 1890s, effectively vanishing from the turn of the century.

2.2 Harvest fluctuations

The Federico estimates are initial second-generation medium-term-trend estimates; the preceding "centennial" estimates typically reflect the year-to-year fluctuations suggested by the historical data, but badly distort the longer-term picture. Following precedent (Fenoaltea 1988a, on the silkworm cocoon crop), the later series is here simply amended to incorporate the annual deviations from trend displayed by the earlier one.

The algorithm is straightforward. The Istat-Vitali series (illustrated in Figure 4) is broken up into three segments, respectively 1861–80, 1881–99, and 1900–13. A quadratic trend is fitted to the first and third periods together, and another to the intermediate period.[3] In all three periods, the ratio of the estimate to its trend value is calculated, and its square root is applied to Federico's estimate.

The square-root step is of course an *ad hoc* adjustment. The Istat-Vitali estimates may be excessively volatile, if they use a subset of products to represent the whole (in effect assuming a perfect correlation between documented-production and omitted-production movements). Between 1919 and 1940, when the agricultural data may be presumed of relatively high quality, the year-to-year growth rates vary between +13 and –11 percent. Directly applying the Istat-Vitali relative deviations to the Federico series yields annual variations between +12 and –15 percent in the first period, between +21 and –14 percent in the second, and between +20 and –18 percent in the third; applying their square root reduces their range to more reasonable levels (respectively +9 and –10 percent, +13 and –9 percent, and +12 and –11 percent).

The series so derived is transcribed in Table 4, panel A, col. 1; it is Federico's series, amended only to allow for the harvest fluctuations suggested by the historical data incorporated by the Istat-Vitali series.

2.3 Omitted improvements

The further adjustment to Federico's series aims to remedy the improper omission of the value added in on-farm improvements to the land. Their archetype is the conversion from pasture or cultivation to vineyards and other tree crops: an investment typically carried out by the agricultural labor force itself, an expenditure side item with no counterpart, at present, in the production-side estimates.

The present adjustment is highly tentative. The sought-for value added series does not appear to exist in the literature; but Vitali (1968) – a mimeographed working paper apparently spawned by his work on the centennial project – contains closely related estimates of investment in land improvements at current and constant prices, at today's borders. These series are here transcribed, not least to resurrect them, in Table 4, panel A, cols. 2 and 3.[4] The description of the current-price

[2] Federico (2003) himself points out, in a final footnote, that his demand side warrants revision in the light of the wage series in Fenoaltea (2002).

[3] The early and late years are considered together, as both appear to reflect relatively credible data: the late tail reflects the reorganization of the data-gathering process, the early one is confirmed by, and perhaps based on, fiscal data (Fenoaltea 2011a, p. 23).

[4] The current-price series appears in Vitali (1968), Table 8, the constant-price series in Table 9. Vitali's tables

series' derivation (ibid., pp. 20–21) is encouraging: Vitali used a broad range of sources to document the acreage devoted to tree crops at varying dates, and the unit costs of the attendant improvements (no doubt also at varying dates); the measured increases in acreage were distributed over the relevant intervals at even rates, unless, we are cryptically informed, there was reason not to.

Vitali seems not to discuss his deflator; but it can readily be calculated. It is clearly (dominated by) the Istat cost-of-living index: not only a poor index of the cost of living (Fenoaltea 2002, 2011a, pp. 127–131), but here, it would seem, the wrong index altogether. The dominant cost item in these improvements was not the cost of commodities (in the cost of living index, largely basic foodstuffs priced in international markets), but the cost of labor, the labor of the agricultural work force itself; deflation by an index of rural wages would be more appropriate, and it would yield a very different time path (ibid., pp. 125–129).

That is not an insurmountable problem, as an alternative deflator can readily be substituted; the more serious difficulty is the paucity of *useful* acreage data. The early editions of the *Annuario* (*1878* part II, pp. 98–104, *1886*, pp. 853–857, *1889-90*, pp. 610–611, 635–637) report in particular vineyard acreages equal to 1.87 million hectares in 1870-74, 1.93 million in 1876-81, and 3.17 in 1879-83, and a subsequent 11 percent increase to 1884-88; but the 1876-81 figure is treated as a corrected figure (for "1874") rather than an updated one, and cannot be used to measure acreage growth over the 1870s. The subsequent increase (to "1883") is said in turn to be partly bogus, as the measurement criteria were not uniform, and only the (11 percent) growth over the next few years is presented as a proper measure. Acreage data were subsequently omitted as unreliable (*Annuario 1905-07*, p. 397); they reappear in the *Annuario 1911* (p. 101), which reports 3.57 million hectares under vines intermixed with other crops and .91 million "specialized" hectares. The quantities of wine obtained from the two were similar, suggesting a ca. 1 to 4 ratio in the density of the vines (and a corresponding range in the cost of conversion to an unspecified "vineyard").

Vitali seems not to have used the far more solid data on international trade: they are not listed among his sources, and they sit poorly with his series' sharp decline over the 1880s, as wine exports in particular grew by leaps and bounds until they were throttled, after 1887, by the tariff war with France (*Sommario*, p. 161).[5]

In the circumstances, the present estimates are obtained as follows. To capture at least the information on conversion costs it apparently contains, Vitali's current-price investment series (Table 4, panel A, col. 2) is deflated by the agricultural-wage series in Fenoaltea (2011a), p. 125, shifted to set 1911 = 1; the resulting figures yield a total of some 6,000 million lire at 1911 prices. That is a value figure, and therefore in principle exceeds the value added of concern here; and it may well be overstated in its own right, to the extent that Vitali's took the above-noted increases in the vineyard-acreage data at face value. On the strength of these considerations, and sadly little else, total value added in improvements is here set at 80 percent of that value figure, or 4,800 million lire – a rough figure, but fortunately one under the average *annual* product of agriculture: not much is here at stake.

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include other investments in agriculture (land reclamation, machinery), but as noted their production-side equivalents are already covered. The discrepancy between today's borders and those of 1871–1913 can be considered immaterial. Vitali also mentions other improvements such as the construction of access roads, and of farm buildings; this hints at double-counting, to the extent that (at least in principle) the present construction estimates include all buildings.

[5] Vitali's implicit lag between planting and abundant harvesting seems excessive: if not on agronomic grounds certainly on economic ones, as it implies that Italy's landowners had the ability to predict prices and policies up to a decade into the future.

In 1911, according to Federico, production included some 42.7 million hectoliters of wine, 7.4 million quintals of citrus fruit, and 2.2 million quintals of olive oil (Rey 2000, pp. 14–15); exports equaled some 1.2 million hectoliters of wine, 3.9 million quintals of citrus fruit, and .4 million quintals of olive oil (*Sommario*, p. 161), implying a domestic consumption of some 41.5 million hectoliters of wine, 3.5 million quintals of citrus fruit, and 1.8 million quintals of olive oil. For simplicity, the consumption of all three goods is here extrapolated using a simple index obtained as the product of a population index and a per-capita consumption index. The (constant-border) population index assumes constant geometric growth throughout; setting 1911 = 1, and using the data in the *Sommario*, p. 39, the 1861 benchmark is set at (25/35). The per-capita consumption index assumes constant growth between benchmarks (and beyond the last to 1913); allowing for the major movements in the calculated (rural) real wage (Fenoaltea 2011a, p. 125), assuming an income elasticity near (1/3), and again setting 1911 = 1, the selected other benchmarks are .80 in 1861, .76 in 1873, .89 in 1888, and .90 in 1895.

Expected production, which tracks acreage, is estimated as domestic consumption plus "normal" exports, themselves calculated as a five-year moving average of recorded exports, with triangular weights (.11 on $t-2$ and $t+2$, .22 on $t-1$ and $t+1$, and .34 on t).[6] The resulting production series are transcribed in Table 4, panel B, cols. 1–3. Cols. 4–6 are derived directly from these: to approximate the expansion of the corresponding acreage they transcribe, good by good and year by year, the increase in estimated product over the previous peak.

Cols. 4–6 are then simply summed, year by year: per acre, vineyards seem at once more costly, and in physical terms more productive, than citrus or olive groves, and the appropriate deviation from unit weights is not obvious. That sum, shifted one year backward (assuming no change in 1913) to allow for investment/production lags, is here used to allocate, over the years, the 4,800-million-lire cumulative value added in improvements estimated above; the resulting series is transcribed in Table 4, panel A, col. 4. Like Vitali's series (col. 3) it grows sharply over the late 1870s, but unlike his it remains high, and reasonably so, until the market was upset by the tariff war with France.[7]

The revised 1911-price estimates of value added in agriculture (Table 1, col. 1) are the sum of the harvest-corrected series in Table 4, panel A, col. 1 and the on-farm-improvements series in col. 4.

3. INDUSTRY

In Table 1 above, cols. 2–18 refer to industry. The time series are a mixed bag, old and new, good, bad, and ugly. The (relatively) "good" series are those drawn from the completed chapters of the present author's work in progress (Fenoaltea 2015a–2015h, 2019, which provide a full description of their derivation); of these, only those for textiles, apparel, and construction are unchanged from

[6] The calculations assume constant exports to 1861, and from 1913. Because the *Sommario* trade figures for 1861 refer to only part of the new Kingdom, and tend to undercount specifically Southern products, citrus exports in 1861 are set equal to the figure reported for 1862.

[7] The tariff war started in 1888, but the quarrel was brewing in 1887; that expectations should have been revised, and investment curtailed, already in that year is entirely credible. The investment/production lag is limited to one year to maintain that timing.

Fenoaltea (2005), the others are revised (and correspondingly bold-dated).[8] The lower-quality series (food, tobacco, wood, paper and printing, sundry manufacturing) remain as they were then.

Table 1, col. 2 refers to the extractive industries; the immediate source is Fenoaltea (2015b), Summary Table B.3, panel B, col. 9. The sector was studied in depth long ago (Fenoaltea 1988b), and if memory serves the only change to the 2003 product-specific production series that is at least conceptually significant is the addition of a series for the extraction of mineral water.[9] The quantitatively more meaningful modification has a different origin altogether, tied to the national income accounting conventions. As already noted (Fenoaltea 1988b; 2005, pp. 306–307; 2020a, §2.5, footnote 42), the conventional measures treat the extractive industries as if they created goods-above-ground out of thin air; the author's early estimates treated them, more sensibly, as producers of goods-above-ground from goods-below-ground. The 2005 series converted those estimates to the absurd conventional basis by directly inflating the extant subaggregates for mining on the one hand and quarrying on the other; the 2015 estimates separately inflate the unit value added attributed to each of the 32 identified products (Fenoaltea 2015b, Summary Tables B.1–B.2), and accordingly capture composition effects better than before. The new series is illustrated in Figure 1, panel B1; it is there also compared to its predecessor (and to Baffigi's series, essentially indistinguishable from the latter).[10]

Table 1, cols. 3 and 4 refer to the food and tobacco industries, respectively; both simply reproduce the highly preliminary series in Fenoaltea (2003), Table 2, for the overwhelming reason that no further work has been done on either one. But they are not quite birds of a feather. As there noted (ibid., pp. 728–730), the tobacco series is crudely derived from the sources, and stands on its own. The food series is instead derived on the assumption that food consumption varied with non-food goods' consumption (with a 40 percent elasticity, derived from the Bank of Italy benchmarks), and allowing for international trade.[11] In principle, therefore, the food series should be recalculated

[8] Fenoaltea (2015a) is a general introduction to the sources and methods, the others papers are sector-specific. The second-generation reconstruction of the food and tobacco industries has yet to be started. That of the wood, paper and publishing, and sundry manufacturing industries, is also well along, but of uneven quality. With respect to Fenoaltea (2017a) the only change is to the estimates for the leather industry (and to the higher-level aggregates).

[9] Its quantitative significance is minor, as it is a smoothly growing series with a value added of under 3 million lire in 1911. "If memory serves": there is no variorum edition of the author's drafts, and a perusal of old hard copies to reconstruct the changes does not seem worth the bother.

[10] In Figure 1, the comparisons to Baffigi's series appear only in the panels for major groups of industries, as he did not separately consider individual manufacturing industries. The series for the latter that simply reproduce the 2003 estimates are not here illustrated at all; the corresponding figures may be found in Fenoaltea (2011a), p. 36.

[11] Baffigi (2015) discusses the present author's work very generously, in both senses; but his comments on these food-industry estimates may be worth clarifying. As he tells it, that industry's value added is assumed to vary, with a limited elasticity, with that in the production of other non-durables: it is accordingly an exception to the present author's "second-generation" methodology, and close in fact to the standard (and by the present author much reviled) practice whereby the undocumented industries are simply assumed to vary as the documented ones (ibid., pp. 101–103). A demurral is in order. As noted in the text, the elasticity-based calculation is not applied directly to production, but to *consumption*, essentially on Engel-curve grounds, and production is then estimated by allowing for international trade. The estimates are crude, but methodologically of a piece with the others. Then, and now, these preliminary series violate not the third second-generation rule (re: indexation) but the second (re: disaggregation): see Fenoaltea (2020a), pp. 8–24.

to reflect the modifications to the other series; but this recalculation has not been performed. One reason is that the estimates are unlikely to change at all significantly, given the modest changes to the other relevant series.[12] Another, more compelling reason is that the inclusion of an updated food series could easily suggest, improperly, that it had been seriously improved; the reproduction of the old series meets the Pompeia criterion.

Table 1, cols. 5 and 6 refer to the textile and apparel industries. The immediate sources are Fenoaltea (2019), Summary Table H.3, cols. 8 and 11; to enhance comparability with the previous estimates for industry and the services, col. 11 excludes the maintenance of textile goods (notably that provided by washerwomen). These are also unchanged; but those industries were exhaustingly researched decades ago, and those estimates are as good as any currently available.

Table 1, col. 7 refers to the leather industry; the immediate source is Fenoaltea (2019), Summary Table H.3, col. 9 (which includes maintenance, notably shoe repair, again to maintain consistency with the estimates for the services).[13] The 2003 series was a very simple log-linear extrapolation of the 1911 benchmark using the four census labor force figures (1871, 1881, 1901, and 1911), corrected to reflect the long-term productivity growth rate of the technologically similar clothing industry; its odd deceleration from the turn of the century was noted, but left at that (Fenoaltea 2003, pp. 728–729). The estimates for the leather industry have very recently been thoroughly revised, and now meet the standards of the second generation. The changes from the preliminary series are quite significant (Figure 5, panel A).[14]

Table 1, col. 8 refers to the wood industry; it too is transcribed from Fenoaltea (2003), Table 2. The 2003 series is of low quality (ibid, p. 727), not least because the industry is very poorly documented, but it has not been improved by further work.

Table 1, col. 9 refers to the metal industry; the immediate source is Fenoaltea (2015e), Summary Table E.3, col. 3. The industry was extensively researched long ago, and the modifications since 2003 reflect no more than detail refinements. The new industry aggregates are generally higher than before, as some 1911-price estimates of value added per ton were revised upward, and more volatile in the early decades, as the estimates of input supply that underlie the ferrous-metals output estimates are less vigorously smoothed (Figure 5, panel B).

Table 1, col. 10 refers to the engineering industry; the immediate source is Fenoaltea (2015f), Summary Table F.3, col. 20 (which includes maintenance). The 2003 aggregate combined four provisional indices, and took its essential movements from the apparent consumption of ferrous metals excluding rails. By 2015 the estimates had been brought up to second-generation standard,

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[12] The short-term variations captured by the new series for agriculture are not particularly relevant, as trade and inventory movements smooth out the harvest cycles.

[13] The estimates for the services are based largely on the census labor-force figures, as rendered homogeneous over time (Vitali 1970). Vitali transferred washerwomen from the textile-related industries to cleaning services, but left the entire shoe-industry labor force (mostly cobblers) in the leather industry.

[14] Fenoaltea (2017a) contained improved preliminary estimates, which added an 1861 census benchmark (corrected for border changes), and calculated the productivity-growth correction separately for each intercensal period: the productivity-enhancing diffusion of (largely hand-powered sewing and other shoe) machinery seems to date essentially from the turn of the century, and once the changing pace of productivity growth was allowed for the estimated path of the industry's product no longer displayed its odd deceleration after 1901. That series too turned out to be quite wide of the mark; that there is no substitute for actually doing the work may be a source of comfort, or of despair.

and the industry aggregate now combines 46 separate new-production and maintenance series. The two aggregates are illustrated in Figure 5, panel C: the reduced estimate of production over the 1880s reflects newly captured composition effects, the reduced (and varying) growth rate over the previous decades the inclusion of (wood) sailing-ship construction.

Table 1, col. 11 refers to the non-metallic mineral products industry; the immediate source is Fenoaltea (2015c), Summary Table C.3, col. 3. Like the metal industry it was extensively researched long ago; the modifications since 2003 are very minor (Figure 5, panel D), and again reflect no more than detail refinements.

Table 1, col. 12 refers to the chemical (and related) industries; the immediate source is Fenoaltea (2015d), Summary Table D.3, col. 16. The 2003 estimates have been revised, mainly by further work on the poorly documented traditional sectors (e.g., soaps, essential oils). The most significant correction reflects the inclusion of the pharmaceuticals produced by chemists, as their share of the total markedly (and, *e verbis*, obviously) declined over time (Figure 5, panel E).

Table 1, cols. 13, on the paper and printing industries, and 14, on sundry manufacturing, are also transcribed from Fenoaltea (2003), Table 2. The former industries were seriously researched many years ago, but may warrant revision; the series for sundry manufacturing is a simple provisional index.

Table 1, col. 15 refers to total manufacturing (the simple sum of cols. 2–14). Figure 1, panel B2, illustrates the new aggregate, and compares it to its predecessor (and to Baffigi's series, again indistinguishable from the latter). The modifications to the aggregate, dominated by those to the engineering and especially the leather series, increase the estimates for the 1860s by some 8 percent, and reduce the subsequent growth rate, especially over the 1870s. The quality rating of this subaggregate is brought down by the low scores of the important food and wood industries; overall, like the agriculture series, it rates no more than a 2.

Table 1, col. 16 refers to the construction industry, including maintenance. The immediate source is Fenoaltea (2015h), Summary Table K.1, col. 18, but these estimates too are unchanged (and, his post-1911 extension apart, the same as Baffigi's, Figure 1, panel B3); as in the case of the textile and clothing industries, a serious research effort was made in the now distant past.

Table 1, col. 17 refers to the utilities industries; the immediate source is Fenoaltea (2015g), Summary Table J.3, col. 4. These estimates too have recently been revised, significantly increasing production at Unification, and reducing the subsequent growth rate (Figure 1, panel B4). The revision is specific to the water-supply industry: the previous estimates assumed that the undated aqueducts were built at the same pace as the dated ones, the current ones that the undated aqueducts were undated because they were (very) old.

Table 1, col. 18 refers to the total for all industry (the sum of cols. 2 and 15–17). It is illustrated, and compared to its predecessor (and again to Baffigi's series) in Figure 1, panel B; the resulting patterns resemble, in muted form, those described above for the manufacturing subtotal alone. Since the non-manufacturing industries all rate a 4, the rating for this series is bumped up a notch with respect to that given manufacturing: perhaps abusing the privilege of self-grading, it is given a 3.

4. SERVICES

4.1 Introduction

As will be recalled (Fenoaltea 2020b, §2.3), Baffigi's 1911-price series for the services are derived from the quantity estimates compiled by Battilani, Felice, and Zamagni (2014), which make no use of their earlier counterparts by the present author (Fenoaltea 2005): the later estimates are not

improved, they are merely different (and, as also noted, not consistent with the industrial side of the sesquicentennial corpus).[15]

Rebus sic stantibus, the services are usefully reconsidered, component by component: to improve the quantity indices that entered the present author's (internally consistent) estimates of 2005, and also, as it turns out, to revise Zamagni's 1911 "benchmark" estimates, until now accepted at face value. The new series, derived as described below, appear in Table 1, cols. 19–24, and, summed, in col. 25; they are illustrated in Figure 1, panels C1ff.[16] The series for transportation, commerce, and buildings' services are the more thoroughly recast, and given a quality rating of 3; miscellaneous services remains a sorry 1, the others rate no more than a 2, and so of course does the sector total.

The revisions are non-trivial. The extant 1911 benchmarks appear often quite seriously distorted, in both directions; but the overstatements have it, and the sector total is here reduced by 14 percent.[17] The entire series is of course shifted down by the reduction of its 1911 anchor; its path is also significantly altered, and the aggregate services series too now displays a clear Kuznets-cycle swing (Figure 1, panel C).

4.2 Transportation and communications

4.2.1 Introduction

The present author's 2005 sector series was built up as the sum of six components, each of which extrapolated the (Zamagni) "benchmark" estimates for 1911 with a suitable real index (Fenoaltea 2005, pp. 307–308 and Table B.1). The sesquicentennial 1911-price estimates appear to borrow the 2005 series for the communications subsector, but the estimates for transportation proper appear to be so complex as to defy summary (Baffigi 2015, p. 109).[18] The two extant sector series, and the new one, are illustrated in Figure 1, panel C1: the 2005 estimates and Baffigi's much resemble each other, save that Baffigi's series is initially lower and grows more rapidly, and is also more nearly log-linear over the later decades (perhaps incorporating the Battilani-Felice-Zamagni assumption that

[15] The existence of the constant-price estimates for the services in Fenoaltea (2005) is recalled in Battilani, Felice, and Zamagni (2014) only to note that the shares of value added these attribute to the services – "23.5 percent in 1861" and "26.8 percent in 1911" – are far below their 28 percent in 1861 and ca. 38 percent in 1911, both presumably at current prices (p. 59). The complaint about the present author's estimate for 1911 is mystifying, given that it was, like theirs, Zamagni's own "benchmark" figure (sector by sector, and *in toto*); even more mystifying is their ability to obtain 23.5 percent as the ratio of 3,231 to 9,288 (.35), in 1861, and 26.8 percent as the ratio of 7,520 to 20,253 (.37), in 1911 (Fenoaltea 2005, Table 3).

[16] The series for the services in Table 1 are typically not identical to their counterparts in Fenoaltea (2017a), as the estimates have been further refined; but the differences are comparatively minor.

[17] In retrospect Istat's original "centennial" net aggregate (6,020 million lire) appears much closer to the mark than the subsequent "benchmark" net estimate (7,520 million lire) that anchors the sesquicentennial and Fenoaltea (2005) series (Rey 2000, pp. 245, 367; *Reddito nazionale*, p. 294): the latter increased the former by 25 percent, the present revised figure (6,495 million lire) is under 8 percent above Istat's.

[18] Why this one quantity series was borrowed from the 2005 corpus, and all the others were not, is not explained.

road transport was tied to marketed consumption, and their priors as to the share of the latter in total consumption, Battilani, Felice, and Zamagni 2014, pp. 9–11, 16).

The new 1911-price value added series for the transportation-and-communications sector (Table 1, col. 19) is again the sum of disaggregated estimates; these are collected in Table 5 (analogous to the Table B.1 in Fenoaltea 2005). The estimates for communications (Table 5, col. 7) are unchanged; the transportation estimates are amended as described below.[19] As can be seen in Figure 1, panel C1, the revised estimates differ from their predecessors in two major ways. First, they are significantly lower: the entire series is shifted down as the 1911 benchmark is reduced from 1,126 to 957 million lire, largely through the elimination of double-counting in Zamagni's 1911-benchmark estimates (in Rey 1992) for railway and other inland transportation.[20] Second, the extrapolated series is far more sensitive to the construction cycle; this stems from the replacement, in the road-transport component, of the extant indices based on the readily available value-added measures of commodity production by a new index that directly reflects the estimated weight of the commodities moved by the road-transport industry.

4.2.2 Railway transportation

The railway-transportation series (Table 5, col. 1) is here doubly amended, as both the 1911 benchmark and the index of its time path are revised. The earlier series simply borrowed Zamagni's "benchmark" estimate of 454.1 million lire in 1911, obtained from firm-level data (for the State railways, *in primis*) essentially as the aggregate wage bill plus an estimated return to capital (Rey 1992, pp. 198–199). That estimate failed to recognize that the railway companies were not just transportation companies but also construction companies (maintaining, and perhaps improving, their fixed plant) and engineering works (maintaining their vehicles in specialized repair shops); to measure the transportation sector correctly (and to avoid double counting), one must exclude the industrial value added properly (and already) attributed to construction and engineering. In 1911 estimated value added in railway construction work includes 38.9 million lire in extensions, 34.9 million in renovations and improvements, and 35.1 million in maintenance of railway tracks (Fenoaltea 2015h, Table K.10), that in engineering 61.7 million lire in railway-vehicle maintenance (Fenoaltea 2015f, Summary Table F.2), for a non-trivial total of 170.6 million lire; but that figure needs to be reduced by outsourced work, which would not be covered by Zamagni's benchmark.[21]

On the engineering side, outsourced maintenance was significant in the case of the State railways, perhaps as one of the many favors the State bestowed on the heavy engineering industry. In 1911, estimated value added in railway-vehicle maintenance totals 61.7 million lire, of which 57.5 by the State railways and 4.2 by minor railways (Fenoaltea 2015f, p. 63). Averaging over the State-railway maintenance expenditure data for 1910-11 and 1911-12 (*Relazione F.S. 1911-12*, p. 253), in 1911 some 36 percent of maintenance work was outsourced; double-counted engineering value added is accordingly estimated as (.64(57.5) + 4.2) = 41.0 million lire.

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[19] With respect to the estimates in Fenoaltea (2017a) only those for non-rail inland transportation have been further revised.

[20] The "benchmark" estimate of 1,126 million lire increased Istat's "centennial" estimate (988 million lire) by 13 percent (Rey 2000, p. 245); the present revision, to 957 million lire, reduces it by 3 percent, essentially confirming it.

[21] The State railways' wage bill, for example, includes the wages of their own repair-shop workers, but not the wages of those employed by private firms engaged in sub-contracted maintenance.

On the construction side, the evidence is less clear. Maintenance appears to have been done in-house, as a standard practice (ibid., pp. 255, 260). As to improvements and new construction, some was clearly done in-house (by the State railways' 5,595 dedicated workers, ibid., p. 275, with who knows what contribution by the ordinary maintenance staff), some clearly not (given the reference to *ribassi d'asta* on expenditure on new lines, ibid., pp. 278–279). Presumably, new lines were typically built by specialized construction companies, while mere improvements, such as the doubling of track, were close to ordinary maintenance work and more likely to be done in-house; here, double-counted construction work is tentatively estimated from the above figures as all of the value added in maintenance, 65 percent of that in improvements, and none of that in extensions, for a total of (35.1 + .65(34.9)) = 57.8 million lire.

Summing these two partial estimates, the total estimate of non-transportation value added in Zamagni's benchmark equals 98.8 million lire, for a revised railway-transportation benchmark of 355.3 million lire.

The railway-transportation series in Fenoaltea (2005), Table B.1, col. 1 extrapolated the benchmark in proportion to total passenger- and freight-car axle-kilometers (a modest correction to simple vehicle-kilometers, as the mean number of axles per vehicle changed very little). Here, the (revised) benchmark is extrapolated using the (sum of the) new series for total passenger- and freight-car vehicle-ton-kilometers (Fenoaltea 2015f, Table F.41, cols. 2–3); the new series allow more directly for the vehicles' growing weight (size), and the attendant growth in their carrying capacity.

4.2.3 Tramway transportation

The machine-tramways transportation series (Table 5, col. 2) is amended much like the railway component. The 1911 benchmark of 69.7 million lire (including minor other systems, Rey 1992, p. 200) is again reduced to exclude double-counted value added, here simply identified with the maintenance component of tramway-related construction (3.5 million lire, Fenoaltea 2015h, Table K.10) and engineering (5.35 million lire, Fenoaltea 2015f, Summary Table F.2), or 8.9 million lire, for a revised figure of 60.8 million lire.

The extrapolation of the machine-tramway benchmark is also amended. Where the earlier series used a simple number-of-(passenger and freight) vehicles index, the new series extrapolates the benchmark in proportion to the (estimated) total weight of passenger and freight cars in service. This index is calculated as the sum of Fenoaltea (2015f), Table F.42, cols. 2–6 (with a 25 percent reduction of the electric-locomotives-and-rail-cars in col. 4, to allow at once for the few locomotives and for the drive trains of the rail-cars).

The horse-tramway transportation series (Table 5, col. 3) is unchanged, and the rail-guided transportation total (col. 4) is again the simple sum of its components (cols. 1–3). The new total is generally well below the earlier one, but grows perceptibly faster, with an initial value just 2.3 percent, rather than 4.2 percent, of the final one.

4.2.4 Other inland transportation

From a national-income-accounting perspective transportation is an unusual activity. Transportation, and specifically non-rail overland transportation, is part of every (other) economic activity, much as the production of motive power is (or at least, before electricity, was) part of (near) every materials-processing activity. In theory, of course, "industries" and "production" should follow activity and product lines, and disregard mere organization; in practice, in collecting statistics individual firms simply cannot be asked to break themselves down to separate their power production, and their transportation, from their characteristic activity. In statistical practice, therefore, the "transportation industry" is defined by the production of its characteristic product *only for sale to*

third parties (exactly like the power-generating component of the utilities industries).[22] By this reckoning, a carter permanently employed by a cotton firm (perhaps to move yarn from the spinning plant to the weaving plant) is part of the textile industry, and not the transportation industry.

Zamagni's "benchmark" estimate is based on the professional distribution of the population in the 1911 census (Rey 1992, p. 202): a distribution based not on firms' reports of their labor force, but on individuals' reports of their profession. The census did ask for a very detailed description; but (without having researched the issue) one suspects that the Census Bureau counted self-declared cotton-industry carters simply as carters, and that a fair proportion of the census enumerators simply took "carter" as an adequate response, thank you, next question. One suspects, in short, that the census count yields a measure closer to a transportation-activity count than to a (now) standard "transportation-industry" count. Within limits: farmers may have spent ten percent of their time as carters, but it is a safe bet that the census did not count ten percent of the self-declared farmers as carters.

The 1911 benchmark, consistent by construction with the 1911 demographic census, appears correspondingly inconsistent with today's definitions of the industry. The problem stems not from (typically part-time) carting by workers in agriculture, as noted, but by carters in industry and other services. So long as the industrial and other-services benchmark estimates are also generally consistent with the demographic-census professional counts, however, the resulting figures should at least be quite consistent with each other; in the present state of the art one can be satisfied with that.

The 1911-price series for other inland transportation in Fenoaltea (2005), Table B.1, col. 5 extrapolated Zamagni's "benchmark" estimate for 1911 of 374.5 million lire: 265.7 for road transportation, 89.1 for auxiliary services, and 19.7 million for inland navigation (Rey 1992, pp. 202–203, 212). The auxiliary-services estimate includes some 30 million for the 23,237 persons in census categories 9.65–9.66: these refer to salesmen, labor agencies, and the like, and the census seems properly to have excluded them from the transportation sector (8.3). The residual of some 59 million is attributed to the 22,803 workers in census category 8.34, covering "urban porters" as well as those working at railway and shipping terminals; the estimate is extrapolated from a wage bill of 37.1 million lire (2,900 lire each) for an assumed 12,803 port workers, and 7.5 million (750 lire each) for the other 10,000, adding 10 percent for rents, insurance, and profits, and a further 20 percent for capital consumption. Longshoremen may have been a privileged lot, but it is hard to believe that they earned more than lower-level civil servants (*Sommario*, pp. 204–205; see however Rey 1992, p. 203); nor do their numbers seem to reach Zamagni's estimate, given that the provincial figures for Milan, Turin, Genoa, and Naples (ca. 3,200, 1,200, 4,000 and 4,800, respectively) suggest that a large part of those in the port cities worked the town rather than the port. A prudent estimate of the wage bill would allow for say 6,000 longshoremen at a national average of no more than 2,500 lire each, and the residual 16,800 at Zamagni's 750 lire each, for a total of 27.6 million lire. A prudent estimate of value added ends right there. These town porters were still around in the 1950s, for example to carry the suitcases of the better off from the taxi to the railway carriage: it was back-breaking work for a pittance, profits and insurance were mere dreams, and the capital they consumed was at most the shoes they wore.

[22] Because the in-house generation of power is always considered part of the consuming industry, the value added of the electrochemical industry (for example) falls, and that of the electric utilities increases, if an electrochemical firm that owns its generating plant sells it to a third party, with no change to the production processes themselves.

The revised inland-transportation 1911 benchmark estimate accordingly adds only 27.6 million lire to Zamagni's figures for carting and inland navigation (265.7 and 19.7 million lire), for a total of 313.0 million lire.

This benchmark is here extrapolated with an improved index. The preliminary (2005) series used the movements of total 1911-price value added in commodity production; in a similar spirit, Battilani, Felice, and Zamagni (2014, p. 16) use the movements of aggregate marketed consumption.[23] What such aggregate-value-based indices miss is of course a characteristic feature of the transportation industry's costs and value added, that to a first approximation they depend on distance, and on weight rather than on value.[24] Mean distances are unknown, but unlikely to have varied much over the period at hand: animal-powered road transport is what matters here, and it was always too expensive to be other than overwhelmingly local.[25] The (first and principal) improvement here is to use weight aggregates rather than the extant value aggregates, in essence correcting the 2005 figures to allow for differential transport-value-added to production-value-added ratios.

The new aggregate-weight index is the total-tonnage series presented here in Table 6, col. 18, rescaled to set 1911 = 1.[26] Col. 18 is itself obtained as the sum of the separate estimates for agriculture (col. 1), the various industries (cols. 2–15, and, summed, col. 16), and imports (col. 17).

These disaggregated weight estimates are obtained as follows. Col. 1 refers to agriculture. Federico's benchmark calculates value added from market values rather than farmgate values (Rey, 1992, pp. 14–15); on the reasonable assumptions that transportation from farm to market was (overwhelmingly) provided by the farmers themselves, and (as noted) that the transportation labor force excluded farmers, what needs to be estimated is the subset of agricultural products that was transported, by common (or other sectors') carriers, after its first sale. To a first approximation, this subset would appear to exclude perishables (most sold directly to households, the rest likely brought by the farmers themselves to the local processing plant or railway station).

A rough estimate for 1911 is here obtained from Federico's product-specific quantity figures for 1911 (Rey 1992, pp. 4–6). The non-perishable totals would appear to include all cereals (his group 1.1: 6.50 million tons worth 1,635.4 million lire), wine (item 2.1.2: 4.29 million tons worth 1,725.4 million lire), olive oil (item 2.2.2: .20 million tons, allowing 800 grams per liter, worth 309.1 million lire), other oils (item 2.2.3: .05 million tons worth 40.8 million lire), citrus fruit (group 2.3: .74 million tons worth 95.3 million lire), nuts (items 2.4.8–10, 2.4.13, and forest-product chestnuts: .99 million tons worth 265.9 million lire), wood and related products (group 2.3 plus the corresponding forest products: 11.97 million tons, allowing 750, 500, and 400 kilograms, respectively, per cubic meter of logs, firewood, and charcoal, worth 260.5 million lire), or some 24.74 million tons worth 4332.4 million lire.

This aggregate tonnage is here reduced by a quarter, to 18.555 million tons, to allow for on-farm consumption. This assumption is similar to that used to calculate the sesquicentennial estimates for commerce (Battilani, Felice, and Zamagni 2014, pp. 10–12); but it is here of much reduced import,

[23] The neglect of investment goods, as if machinery and building materials were also brought by the stork, is again surprising.

[24] Whence of course the measurement of the (freight transportation) industry's real product in ton-kilometers (total weight times average length of haul).

[25] The transportation of passengers should be, but will not be, separately considered here.

[26] This index differs from its counterpart in Fenoaltea (2017a).

as the double-digit-percentage correction is applied only to a single component that is itself but a sixth or so of the relevant total (Table 1, cols. 1 and 18), and the net effect on the latter is limited to a low single-digit percentage.[27]

Because these transported goods are (by selection) non-perishables, one can presume that the quantities transported were themselves somewhat less variable than the current harvest. The extrapolating index is accordingly a three-year moving average of the 1911-price harvest-corrected value added series in Table 4, panel A, col. 1 (with unchanged end points), and the 1911 benchmark is itself further reduced (from 18.555 to 18.186 million tons) to reflect the ratio of the smoothed harvest product to the base estimate (7,720.3/7,877). The tonnage series in Table 6, col. 1 is not further refined, to reflect changes in the product mix. Cyclical variations in response to changing (tariffs, ocean freight rates, and derivatively) relative prices may have been significant, but cannot be inferred from the available aggregate series. Federico's disaggregated estimates for 1891 (Rey 2000, pp. 11–17) do permit a repetition of the above calculation for 1911, which yields a total weight for the year of 16.41 million tons.[28] The 1891 ratio of estimated transported tonnage to (harvest) value added of (16.410/6,751) = .00243 tons per lira is very close to the corresponding 1911 ratio of (18.555/7,877) = .00236 tons per lira, and a trend adjustment seems pointless.

Table 6, col. 2 refers to the weight product of the extractive industry. It is obtained as the simple sum of the 32 separate physical-product estimates, excluding only natural gas (Fenoaltea 2015b, Summary Table B.1). It bears notice that in 1911 some 8.0 million tons were mine products, and 52.0 million quarry products, the bulk of them very low-grade kiln and construction materials.

Table 6, col. 3 refers to the weight of the food industries' relevant products. The 1911 benchmark is derived from the present author's "benchmark" estimates (Rey 1992, pp. 119–120); crudely to allow for contract milling of grain consumed on-farm, and for the direct retail distribution by artisanal producers, various production estimates are reduced (items 1.1–1.3, flour, and 3.2, cheese, by 25 percent, items 2.1, pasta, and 2.3, biscuits and pastries, by 50 percent), and some are altogether excluded (item 2.2, bread).[29] The estimates for 1891 (Rey 2000, pp. 128–129) yield a second benchmark; it is calculated as above (save that the excluded share of pasta is increased to 90 percent).[30] From 1891 to 1911, given these estimates, the tonnage transported seems to have grown marginally less than the food industry's value added, reflecting a rise in the share of products with a relatively high production value added per unit weight. On the further assumption that for present purposes this change was negligible in earlier years, the 1891 benchmark in Table 6, col. 3 is extrapolated back to 1861 in direct proportion to value added (Table 1, col. 3), and forward to 1913

[27] The sesquicentennial estimate, drawn from Federico's early work on a small sample of household budgets, is that non-marketed consumption represented 33 percent of the total in 1911 (and 40 percent in 1871, ibid.); but the present author's sense is that these exceed the national average in a land where only one male of working age out of four worked land he (or his family) owned or rented (*Censimento demografico*, vol. 4, pp. 7–31). The share of the population that lived in dispersed housing rose slowly from 25 percent in 1861 to 28 percent in 1911 (Fenoaltea 2015h, Table K.57), and points to a similar order of magnitude.

[28] The reported figure for firewood on p. 15 is taken to be refer to volume rather than, as indicated, to weight (as suggested by the 1911 figure right next to it, which repeats as "tons" the volume figure of the earlier volume, and the firewood figure on p. 16, explicitly referred to volume).

[29] The pure-alcohol figure in the source is doubled, assuming the commercial product was 100 proof.

[30] The share of artisanal pasta presumably declined over time; the present algorithm keeps the estimated output of industrial pasta in a more nearly constant ratio to pasta exports (*Sommario*, p. 161).

with a ratio of tons transported to production value added that is geometrically interpolated between (and beyond) its two benchmark values.

Table 6, col. 4 refers to the tobacco industry; it simply extrapolates the 1911 benchmark (Rey 1992, p. 120) in proportion to the crude extant 1911-price value added series (itself a simple quantity series times a 1911-price value added coefficient: Fenoaltea 2003, Table 2 and p. 728).

Table 6, col. 5 refers to the weight product of the textile industries. It is obtained as the simple sum of the 34 physical-product estimates in units of weight (Fenoaltea 2019, Table H.02, cols. 8 and 10, and Summary Table H.1, cols. 3–34). For present purposes, these estimates are heir to large biases. On the one hand, textile plants were drawn to locations where power was cheap (waterfalls), and thus typically located at above-average distances from the nearest rail line; on the other, significant production was carried out in vertically integrated mills, where intermediate products traveled over negligible distances. Neither is here quantified, as they are mutually offsetting to what is, *Clio juvante*, a negligible residual.

Table 6, col. 6 refers to the relevant weight product of apparel industries. The production of finished textile goods was essentially artisanal (the "large" shops counted by the *Censimento industriale*, vol. 3, in categories 6.91 and 6.92 employed just 24,000 people, against a labor force near 550,000), and presumably produced overwhelmingly to local order by the final consumer; the production of hats and caps were instead highly concentrated (Fenoaltea 2019). Col. 6 is accordingly obtained as the sum of the seven tonnage series for finished textile goods (ibid., Summary Table H.1, cols. 35–41), discounted by 90 percent, the four series for caps and hats (ibid., cols. 44–47), here attributed an average 250 grams per unit, packed for shipment, and the two for felts and straw braid (ibid., cols. 42 and 48).

Table 6, col. 7 refers to the relevant weight product of the leather industry, estimated as the sum of the following components. Leather output, the product of the tanneries (Fenoaltea 2019, Summary Table H.1, col. 54) is entirely included. New shoes and gloves (ibid., cols. 49–50) are allowed shipping weights (set equal to leather consumption, assuming boxing offset waste) of 1.00 and .05 thousand tons per million pairs, and discounted by 5 percent to allow for direct sales by artisans. Other leather products (ibid., col. 51), also entirely included, are similarly allowed .172 thousand tons per million lire of value added. Fur goods (ibid., col. 52) are also discounted by 5 percent to allow for direct sales by artisans. The estimate of hair and feather products (ibid., col. 53) is more complex, as production was estimated directly as 1911-price value added, with the 1911 benchmark of 4.94 million lire derived from census data. In 1911, the *Movimento commerciale* valued exported crude and processed ornamental feathers at 70 lire and 290 lire per kilogram, respectively, and crude and processed hair at 90 lire and 150 lire per kilogram, respectively; at a guess, average value added is here set at 100 lire per kilogram, or .010 thousand tons per million lire of value added (not discounted, allowing direct sales to offset the extra cost of shipping at volume rather than weight charges). The aggregate is dominated by the leather and shoe components, both relatively sturdy.

Table 6, col. 8 refers to the wood industry. It is again a poor series; it is here calculated by borrowing the present author's now decades-old preliminary estimate of output quantities in 1911 (1.39 million tons of finished lumber and .79 million tons of wood products, unpublished), and extrapolating their sum in proportion to the value added series in Table 1, col. 8.

Table 6, col. 9 refers to the relevant weight product of the metals industry. It is obtained as the simple sum of the 16 separate physical-product estimates (Fenoaltea 2015e, Summary Table E.1), excluding rails (presumably loaded directly onto freight cars) and half of pig iron and ingot aluminum, copper, and lead (to allow for vertically integrated production).

Table 6, col. 10 refers to the relevant weight product of the engineering industry. It is similarly obtained from the latest disaggregated estimates (Fenoaltea 2015f, Summary Table F.1), but the

algorithm is slightly more complex, as it is the sum of two components. The new-production component is estimated by summing across products (ibid., cols. 1–26), altogether excluding ships and rail-guided vehicles (ibid., cols. 2–19); the resulting figure in 1911 equals 619,000 tons. The maintenance component is estimated from metal consumption in maintenance (ibid., Table F.53, col. 11), doubled to allow for the occasional movement of the entire machine rather than of the replacement parts; in 1911, it adds near another 8,000 tons.

Table 6, col. 11 refers to the relevant weight product of the non-metallic mineral products industry. It is obtained as the simple sum of the 10 separate physical-product estimates (Fenoaltea 2015c, Summary Table C.1).

Table 6, col. 12 refers to the relevant weight product of the chemical industry. It is obtained as the simple sum of the 98 separate physical-product estimates (Fenoaltea 2015d, Summary Table D.1). The only adjustments are the exclusion of metallurgical coke (consumed in vertically integrated works), and the conversion of photographic plates from a surface measure to a weight measure (allowing 6.25 tons per thousand square meters).

Table 6, col. 13 refers to the paper, paper products, and publishing industries. The series is the sum of separate physical output estimates, referred respectively to rags and pulp, to paper and cardboard, and to paper products and printed matter.[31]

Table 6, col. 14 refers to other manufacturing. Quantity estimates are not available, and the benchmarks for 1911 are built up from the employment side; they allow a value added of 12.3 million lire to the photographic industry, and 14.2 million to the residual (Rey, 1992, pp. 171–173). The value added series are very crude; the former component is indexed by the production of photographic material (itself estimated from silver nitrate consumption), the latter is simply attributed a constant growth rate (Fenoaltea 2003, p. 729). Again grasping at straws, the former is attributed the weight of the photosensitive material produced, and the latter, *faute de mieux*, as much again in 1911.

Table 6, col. 15 refers to the other components of industry, construction and the utilities; it is simply a null column, as neither sector's product moved (by road, or at all). Col. 16 is the total for industry (the sum of cols. 2–15).

Table 6, col. 17 refers in turn to imports. The 1911 benchmark near 19.6 million tons is the sum of the maritime and overland import tonnages estimated by Mauro Marolla and Massimo Roccas (Rey 1992, pp. 260, 264). Federico *et al.* (2011) report, from 1862, current-price imports, including the primary-product and manufactured-goods subaggregates (pp. 88–91), and price indices for those subaggregates (pp. 226–227); these yield deflated series that serve here as quantity indices. The import-tonnages in Fenoaltea (1983), Table 3.9, col. 2 identify 16.0 million tons of imports (out of 19.6), of which 14.9 million, or some 93 percent, were primary products; excluding coal (9.8 million tons), the primary-product share drops to 82 percent. Here, primary products are assumed to account for a round 90 percent of the 1911 total tonnage (implicitly assuming, not unreasonably, that primary products represented some three-fourths of the residual ca. 3.6 million tons); 90 percent of the Marolla-Roccas total is accordingly extrapolated using the Federico *et al.* deflated primary-product import series, the residual 10 percent using the deflated manufactured-goods import series. From 1871 to 1913 the series in col. 17 is the simple sum of the two; to allow for the exclusion from the Kingdom (and thus of its trade statistics) of Venetia through 1866, and Latium through 1870, that sum is here inflated by 13.5 percent in 1862–66 and 3.5 percent in 1867–70. Finally, the figure so obtained for 1862 is extrapolated back to 1861 using the constant-price import series in Fenoaltea (2012), Table 1, col. 5 (and thus, indirectly, Istat figures, ibid., p. 304).

[31] The derivation of these unpublished estimates is briefly described in Fenoaltea (2003), p. 728; a full description is available on request.

Table 6, col. 18, is the grand total (the sum of cols. 1, 16, and 17). One notes that the distribution of transported tons is quite unlike that of value added (Table 1): the dominant component was provided by construction-materials industries, and the aggregate series closely follows the construction cycle.

The road-transport index used to extrapolate the revised 1911 value added benchmark is this aggregate tonnage series, simply rescaled to set 1911 = 1.00. In principle, of course, goods of higher value per unit weight can absorb higher transport costs, and therefore travel over longer distances, than lower-value goods. In the case at hand, the share of domestic low-value goods (agricultural, mining and quarrying, and non-metallic mineral products (Table 6, cols. 1, 2, and 11) in the total (col. 18) drifts down from near 80 percent in the 1860s and '70s to some 74 percent from the mid-1890s until ca. 1909, thence partly recovering to some 76 percent in 1910–13; by itself, this evidence would point to a lengthening of the average haul over the 1880s and early 1890s. On the other hand, the 1880s and early 1890s were precisely the years in which the railway net was enriched by the construction of local lines, which would tend to shorten the average haul to the nearest railway station; on balance, there are no clear grounds on which to alter the simple tonnage index one way or the other.

4.2.5 Maritime transportation

The maritime transportation series (Table 5, col. 6) is also amended: not conceptually recast, but brought up to date. The estimating algorithm, which uses a weighted sum of the sail- and steam-powered merchant fleets to extrapolate the 1911 benchmark (from Rey 1992, p. 212), is unchanged; the fleet series are no longer Istat's (*Sommario*, p. 138), but the corrected estimates by the present author (Fenoaltea 2015f, Table F.24, cols. 6 and 7).

4.3 Commerce

4.3.1 Introduction

In the present taxonomy "commerce" is broadly defined to include hotels and restaurants and commercial services as well as trade proper (Battilani, Felice, and Zamagni 2014, p. 12; Fenoaltea 2005, p. 308). The extant series, and the new one (Table 1, col. 20), are illustrated in Figure 1, panel C2.[32] The two extant series are broadly similar, sharing the 1911 benchmark (Rey 2000, p. 365; Battilani, Felice, and Zamagni 2014, p. 12; Fenoaltea 2005, p. 308) and growing, at least from the mid-1870s, at comparable rates. The 2005 series extrapolated the 1911 benchmark with a weighted sum of the commodity-production and transportation series; it is noticeably the smoother of the two. The sesquicentennial series apparently reproduces, using constant-price series, the Battilani-Felice-Zamagni current-price algorithm (Baffigi 2015, p. 108). The available description of the latter suggests the calculation of a "resources" total based on the Federico-Fenoaltea 2005 constant-price estimates for agriculture, mining, and manufacturing and the Istat-Vitali centennial import and indirect tax series (and price indices, to convert the constant-price estimates); the conversion of this total into a consumption series, using coefficients calculated for the benchmark years (and otherwise interpolated); the disaggregation of this last into food and non-food consumption; the reduction of both of these to allow for non-marketed (food and non-food) consumption; the calculation of the trade-proper value added series using (benchmark and interpolated) estimates of the corresponding

[32] The new series for this sector also differs from that in Fenoaltea (2017a), but not by much; the main further revision is to the estimates of the imports acquired by merchants.

mark-ups; and the addition of a (benchmark or interpolated) percentage to allow for hotels and restaurants (Battilani, Felice, and Zamagni 2014, pp. 12–13).[33] The sources of the sesquicentennial series' short-term variability are not clear.[34]

The new series, also illustrated in Figure 1, panel C2, is sharply lower than the extant ones, thanks to a careful revision to the earlier, shared 1911 benchmark: value added in 1911 here totals 1,434 million lire, well below the extant estimate of 2,708 million lire.[35] The new benchmark is extrapolated with an index of the (1911-price) volume actually handled by merchants; that index is more volatile than that entering the 2005 series, as it includes (highly variable) imports as well as domestic commodities, and within the latter the agricultural component is more volatile than its predecessor.

The new series also grows less rapidly than its 2005 counterpart. The latter so weighted the transportation and commodity-production series, which grew at different rates, as to yield a value added in 1891, relative to (selected) other sectors, consistent with the extant 1891 current-price benchmarks (Fenoaltea 2005, p. 308). But that calculus failed to recognize that if one compares a technologically stagnant sector (commerce) to a technologically progressive one (industry), as one goes back from the base year the ratio of the former to the latter at constant prices will exceed the corresponding ratio at current prices (Fenoaltea 1976, 2011b, 2015i). The 2005 commerce series grew at an excessive rate; the new one can be said to have removed that error.

4.3.2 Hotels, restaurants (1911)

The sesquicentennial estimate of hotel-and-restaurant value added in 1911 reproduces Zamagni's initial "benchmark" figure of 407.9 million lire (Battilani, Felice, and Zamagni 2014, p. 12; Rey 1992, pp. 193–195). The latter is based on the labor-force data for census categories 9.41 (hotels, boarding houses), 9.42 (room rentals), 9.43 (restaurants, diners), and 9.44 (cafés, bars). Labor income is estimated by imputing annual incomes per worker for each of the four relevant categories (male/female, owners and managers/other employees). Some imputed incomes are modest (600 lire for hired men and 400 for hired women in category 9.42, 900 and 600 respectively in 9.44); most seem frankly princely, as if the establishments were generally upscale, and the hired help mostly clerical workers rather than menials (and, in the case of women, probably part-time). The labor bill is here reestimated with what appear to be more reasonable annual averages, to wit, for owners and managers, 2,000 lire per male in hotels and boarding houses, 1,500 per other male, and half those figures for females, for a subtotal of 150.05 million lire; for other workers, 700 lire per man and half that for women, for a subtotal of 58.00 million lire, here reduced by 7 percent to allow for unemployment (3 percent) and children (4 percent, as ca. 8 percent of the work force was under 15). The labor bill works out to 204.0 million lire, well under Zamagni's 293.2 million.

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[33] Battilani, Felice, and Zamagni (2014), p. 12 suggests that trade-proper value added refers only to "non-food" consumption, but the text should clearly read "food and non-food," as the food mark-up is included in the benchmark estimates (Rey 2000, pp. 251–252, 364–365; also Baffigi 2015, p. 108). In fact, benchmark food and non-food consumption (and, derivatively, their ratio to the "resources" total) appear to have been borrowed from Vitali's figures in Rey (2002): see Rey (2000), p. 365.

[34] Using the data in the sesquicentennial work sheets (Baffigi 2017), the short-term variation reappears in the ratio of value added in commerce to the sum of imports, net indirect taxes, and value added in agriculture, mining, and manufacturing, both at current and at constant prices.

[35] The (revised) "benchmark" estimate of 2,708 million lire increased Istat's "centennial" estimate (1,543 million lire) by 76 percent (Rey 2000, p. 245); the present revision to 1,434 million lire reduces it by 7 percent, again broadly confirming it.

To allow for capital costs Zamagni inflated that figure by 30 percent, and the result by a further 7 percent, for an additional 114.7 million lire. Here, capital costs are estimated as the rental value of the rooms themselves. The number of rooms is unknown, but can be estimated. Hotels, boarding houses, and rented rooms were attributed a labor force of some 36,000 persons (census categories 9.41–9.42); reasonably assuming that each could care for some 5 rooms, on average, the number of rooms works out to approximately 180 thousand. On the other hand, Mauro Marolla and Massimo Roccas calculated that some 1.065 million foreign travelers spent an average 25 days in Italy (Rey 1992, pp. 254–260), for a total of 26.6 million overnight stays per year, or on average some 73,000 per day. Domestic salesmen (in census category 9.65) were under 20,000; if road warriors away from home 180 days a year, they would account for a further 3.6 million overnight stays per year, or on average under 10,000 per day. Adding as much again for other domestic travelers, mean daily overnight stays come to 93,000; allowing for a mean occupancy rate of 50 percent, the corresponding number of rooms works out to some 186 thousand, serendipitously close to the alternative estimate. Here, 183,000 rooms are allowed a mean annual (cost) value of 200 lire each, a figure patterned on the rental rates calculated below (§4.6.3) for bourgeois rooms in the 40 major urban centers, for a partial total of 36.6 million lire.[36] Restaurants, cafés and the like were attributed a labor force of almost 173,000; allowing on average two persons per room, and a mean annual value of 100 lire per room, this residual component is here set at 8.6 million lire. The present estimate of hotel-and-restaurant value added in 1911 is accordingly (204.0 + 36.6 + 8.6) = 249.2 million lire rather than 407.9 million.

4.3.3 Commercial services (1911)

The second minor element of the broadly defined "commerce" sector refers to "commercial services," essentially those of brokers, agents, salesmen, and the like, which the 1911 census grouped in categories 9.64 (advertising, chambers of commerce, etc.: 373 male and 8 female owner/managers, 1,385 other males and 50 other females), 9.65 (shippers, salesmen: 7,958 male and 106 female owner/managers, 12,159 other males and 206 other females), 9.66 (emigration and placement agencies: 1,229 male and 101 female owner/managers, 1,416 other males and 62 other females), and 9.67 (brokers: 42,708 males and 603 females).

As noted above, Zamagni's initial (and never revised) estimate for transportation included the 23,237 persons in census categories 9.65–9.66 (Rey 1992, pp. 202, 213, 2000, p. 245, Battilani, Felice, and Zamagni 2014, pp. 66, 68). Her initial benchmark for commercial services was correspondingly based on the 45,127 persons in categories 9.64 and 9.67, to whom she attached a value added of 153.1 million lire (Rey 1992, p. 194). The subsequent revision to the estimates for "commerce" raised the commercial-services component to 215 million lire; the modification is not explained, but it is attached to a revised labor-force figure, said to have been borrowed from Vitali, of 63,257 persons (Rey 2000, pp. 364–365). Borrowed without due diligence: Vitali adjusted the 1911 census figures to fit the classification of a later census, and his figure sums over the 1911 census data for categories 9.64–9.67, excluding 25 percent of those in category 9.65 (Vitali 1970, pp. 306, 322–325). The revised "benchmark" estimates for transportation and commerce clearly double-count three-fourths of the workers in category 9.65, and all those in category 9.66; the value added estimates too presumably reflect a measure of double-counting.

The present estimate for these commercial services is based directly on the census data for categories 9.64–9.67, which yields totals of 52,268 male owner/managers and 14,960 other males, and 818 female owner-managers and 318 other females. Noting the near absence of children, and

[36] These round-figure commercial-building rental cost rates are to be understood as gross of maintenance costs, on the now usual grounds.

presuming that the "other" workers were typically clerical, the labor bill is here estimated by attributing 2,500 lire to male owner/managers and 1,800 lire to other males, and half those figures to the corresponding females, for a total of 158.9 million lire. Assuming two persons per room and a rental value of 150 lire per room, fixed capital costs are here taken to add another 5.1 million lire, for a total of 164.0 million lire rather than 215.

4.3.4 Trade proper (1911)

The largest component of the "commerce" sector is of course trade proper. Zamagni's initial "benchmark" estimate of value added in trade proper in 1911, of 2,333 million lire, was not census-based: it was obtained by estimating (food- and non-food) retail sales, estimating the average mark-up, and adding allowances for retail capital costs, wholesale trade, transportation, and peddlers (Rey 1992, pp. 195–197). The revised, still extant estimate reduced the total to 2,085 million lire (2,300, including 215 million for brokers); the bulk of the reduction came from the elimination of double-counted transportation, and the reduction of the non-food retail margin from 32 percent to 25 percent (Rey 2000, pp. 364–365).

But even this revised figure seems off. At first blush, it seems biased downward: by the exclusion of investment (as if builders bought supplies from the factories rather than from dealers), and again by the 33-percent allowances for non-marketed food and non-food consumption. As noted above (§4.2.4, esp. footnote 27), a reduction to exclude non-marketed food from agriculture's product is surely appropriate, but a quarter seems more reasonable than a third. The parallel reduction applied to non-food items seems instead entirely inappropriate, as the estimated industrial product already excludes non-marketed production.[37]

If one allows (as below) for the earnings of labor and fixed capital, on the other hand, the residual earnings on circulating capital imply an average inventory that is too high to be credible. The net bias of this estimate too seems clearly upward; and it may have been introduced at various stages of the underlying calculation. Among the obvious suspects are the retail margins, borrowed directly from those registered in the 1930s; Zamagni's discussion of their likely (failure to) change over time (Rey 1992, p. 195) neglects both the impact of relative technical progress, much slower (if it occurred at all) in commerce than in commodity production, and the impact of the legislation of the 1920s, which curtailed entry and limited competition.[38] Another suspect is her neglect of direct sales by artisans, still very numerous, and in some sectors dominant, in 1911. A third is her estimate of retail food sales: she allowed (perhaps to excess) for non-marketed on-farm consumption, but seems to have forgotten that until relatively recently people shopped for food, daily, at the farmers' market. The name of the venue says it all: the bulk of fresh produce passed directly from the cultivator to the consumer, the merchants of the national-accounts' "commerce" sector never got involved at all.

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[37] This inconsistency is characteristic of the national accounts' atheoretical, practical basis. Agricultural production is estimated from surfaces and yields, and is therefore gross of non-marketed production; industrial production data are collected from firms, and the resulting estimate is therefore net of non-marketed production.

[38] Pierluigi Ciocca emphasizes that the Italian economy was, by its own lamentable standards, unusually competitive in the run-up to the Great War (Ciocca 2006, p. 342, 2007, pp. 137–163, 2008). The quantitative analysis in Giordano and Zollino (2017) points to a sharp reduction in the competitiveness of the Italian economy from 1911 to the 1930s, but it is not clear whether that result is robust to their deeply flawed labor- and capital-input series (Fenoaltea 2020b, §3.4, footnote 16).

A new estimate of value added in trade proper in 1911 is accordingly generated here, by components. Its first component refers to the personnel in census categories 9.21–9.23, devoted specifically to trade: 51,852 male and 18,040 female peddlers (category 9.122), and, in other trade, 225,978 male and 84,016 female owner/managers, 73,562 male and 18,051 female white-collar workers, and 58,354 male and 10,305 female blue-collar workers (cleaning staff, porters, and the like); under 4 percent of the males, and under 3 percent of the females, were under 15. The high proportion of owner-managers points to typically small-scale operations, over half of them one-(wo)man shops, and the white-collar workers were no doubt overwhelmingly shop assistants rather than accountants and the like. Annual labor income was plausibly no more than 2,000 lire, 1,500 lire, and 700 lire for male owner-managers, white-collar workers, and others (including peddlers), respectively, and half that for their female counterparts, for a total labor bill of 665.8 million lire.

The second component refers to the personnel also in trade, but counted elsewhere. One such refers to pharmacists ("chemists"). The census lists 15,801 males and 299 females, in census category 10.75; they are disaggregated only by age, and 2,912 males and 139 females were aged 30 or less. Allowing an annual average of 3,000 lire and 1,500 lire for male pharmacists respectively over and under 30, and half that to the corresponding females, the total labor cost works out to some 43.4 million lire. Deducting the 3.9 million lire allowed for the drugs manufactured in pharmacies and already included in the estimates for the chemical industry (Fenoaltea 2015d, pp. 46–47), a net estimate of 39.5 million lire is added here.[39] The other refers to the manufacture of bread in ordinary, artisanal bakeries. Their value added is included in the food industry, save for an allowance of 20 percent of the total to exclude the personnel engaged in selling rather than baking (Rey 1992, p. 122). Given the estimate of 150.6 million lire attributed to the bread-making industry (ibid., p. 119), the value added to be recovered here is 25 percent of that, or 37.7 million lire.[40] For simplicity, this entire amount is here treated as a labor cost, for a total labor cost in trade proper of 743.0 million lire.

The third component is the return to fixed capital, in essence the (cost) rental value of the shops. The trade-proper census categories (9.1–9.3) include some 540,200 persons; adding (for simplicity) all 16,100 pharmacists (10.75) and one fifth of the 82,800 (bread) bakers, one obtains a total labor force of some 573,000 individuals. Allowing an average of 1.5 to 2 persons per room, the estimated number of rooms equals some 286,000 to 382,000. An alternative estimate compares that labor force to that of the corresponding artisans, numbering perhaps 2.34 million.[41] Assuming an equal number of persons per room in stores and artisans' shops, the former would have accounted for one fifth or so of the available commercial space. Given the estimate of some 25.0 million residential rooms in all (§4.6.3), the number of commercial rooms may have been near one fifteenth of that (calculating, e.g., an average of 3 floors per building, with the ground floor devoted to commercial space in one fifth of the buildings), or some 1.667 million; on the above figures, one fifth of those, or

[39] The manufacturing estimate is based on a value added per worker that seems in retrospect too low, but is used here uncorrected to maintain consistency across sectors. The pharmacists' incomes adopted here reflect the figures cited by Zamagni (Rey 1992, p. 197), excluding the highest (for a mid-career director in a large cooperative firm, of little apparent relevance for the typical stand-alone chemist's shop).

[40] Other artisanal activities could be similarly treated, but are not: all but bread-making are here counted entirely in industry, and correspondingly excluded from the services. The revised benchmark estimates in Rey (2000), pp. 364–365, list some 686,000 workers in trade proper; the source is Vitali (1970), and it includes large numbers of artisans here already counted as industrial workers.

[41] This estimate is obtained as the *Censimento demografico* labor force in manufacturing (census categories 3, 4, 5.1, 6, 7, and 8.1), or some 3.52 million persons, less the 1.18 million in those same categories reported employed in shops with more than 10 employees (*Censimento industriale*, vol. 3).

some 333,000, would have been stores. This last figure, well within the range estimated above, is adopted as the point estimate. Average rents would be distributed across large and small communities much like the residential rooms, which averaged perhaps 65 lire p. a. (below, §4.6.3); given that non-residential (commercial, street-level) rooms apparently commanded rents well above the average (Battilani, Felice, and Zamagni 2014, p. 49), mean rents are here set at 130 lire p. a., for a total of 43.3 million lire.

The extant "benchmark" estimate for trade proper equals 2,085 million lire (Rey 2000, p. 365; Battilani, Felice, and Zamagni 2014, p. 12). Deducting the above estimates of labor costs (735.0 million lire) and fixed capital costs (43.3 million lire) leaves near 1,300 million lire as the return to circulating capital; at 5 to 6 percent interest, it implies a circulating capital – inventories – of 22,000 to 26,000 million lire. Summing the value of imports (3,444 million lire), value added in manufacturing (3,846 million lire, gross of maintenance work and artisanal production not handled by merchants), and (allowing for on-farm consumption but not for farmers' markets) 75 percent of (harvest) value added in agriculture (another 5,908 million lire, from Table 4, col. 1), one obtains a gross overestimate of annual additions to inventory of some 13,000 million lire; and even this is just 50 to 60 percent of the implied corresponding stock. The implication of the "benchmark" estimate is thus that, on average, commodities sat in merchants' warehouses, or on their shelves, for some two entire years, if not more, before they were finally re-sold. That seems much too long; by implication, as noted above, the estimated gross return to circulating capital is much too high.

The fourth component of the present estimate of value added in trade proper in 1911 is a direct estimate of the return to circulating capital, based on the likely annual gross additions to merchants' inventories. As estimated below (§4.3.5 and Table 7), in 1911 these equalled 10,428 million lire; this figure is obtained as recorded production plus imports less allowances for specific items presumably acquired directly by the user, and since these allowances are more likely to be understated (because of omissions) than overstated (by overevaluating the counted items), the residual estimate of the merchants' annual acquisitions is more likely too high than too low. An average holding time of three months may be a low estimate, but one of half a year would seem to be a generous one, not least because a relatively high-interest country like Italy would tend to import grain, for example, on an as-needed basis (from world-wide stocks held where interest rates were lower). Three to six months' average holding time imply an average (merchants') inventory of one-quarter to one-half that figure, or 2,607 to 5,214 million lire; taking the mid-point of that range and applying an interest rate of 6 percent, the present estimate of the annual return to circulating capital equals 234.6 million lire.

Summing over the estimated return to labor (743.0 million lire), fixed capital (43.3 million lire), and circulating capital (234.6 million lire), the present estimate of value added in trade proper equals 1,020.9 million lire. The implication is that merchants (as a group) acquired goods they paid 10,428 million lire, and resold for 11,439 million lire, for a ca. 10 percent (value added) mark-up on costs. Zamagni's estimates for 1938 allow final sales of 55,824 million lire and a total value added in commerce of 13,257 million lire (Rey 2000, pp. 276–277), implying an overall (13,257/(55,824 – 13,257)) = 31 percent mark-up on costs: treble the present figure for 1911, but not *ceteris paribus*.[42] If we assume an annual productivity increase of 3 to 4 percent in commodity production (and zero in trade), commodity-production productivity in 1938 would have been some 2.2 to 2.9 times that in 1911.[43] At 1911 (factor) prices (and levels of competition), with 1938 technology, the goods

[42] Zamagni's total final sales are her retail-sales figures, without the 5 percent deduction for peddlers.

[43] Broadberry, Giordano and Zollino (2011), Table 10, report a mean economy-wide (save housing) TFP growth of some 2 percent p. a. between 1911 and 1938 (Table 11 reports a lower figure, obtained however with conventional, not actual, factor shares). That would appear to be a lower bound, to the extent that their

purchased by merchants would have cost only (10,428/2.2 to 2.9) = 3,596 to 4,740 million lire; the return on circulating capital would similarly have been only (234.6/2.2 to 2.9) = 80.9 to 106.7 million lire, for a value added in commerce of (743.0 + 43.3 + 80.9 to 106.7) = some 867 to 893 million lire, and an overall value-added mark-up of (893/4,740) = 19 percent to (867/3,596) = 24 percent. If we grant that the anti-competitive legislation of the 1920s may have raised traders' margins by 50 percent, *ceteris paribus*, that 19-to-24 percent range becomes a 28-to-36 percent range, well astride Zamagni's apparently data-based figure of 31 percent in 1938. The crux of the matter is that her own estimates of trading margins in 1938 point to a much lower figure in 1911, like the one obtained here: the present estimates for 1911 are more nearly consistent with her evidence for 1938 than her own, which ignore everything that plausibly changed them over the many intervening years.[44]

4.3.5 Commerce (1861−1913)

The estimates of the annual 1911-price gross additions to the merchants' inventories are presented in Table 7, col. 1. The aggregate point-of-sale 1911-price value of the commodities that came available year by year can be approximated as the sum of aggregate value added in the production of goods (Table 1, cols. 1 + 18), value added in inland transportation (Table 5, cols. 4 + 5), and the value of recorded imports (Fenoaltea 2018, Table A1, cols. 6 + 7); this aggregate grows from ca. 6,700 million lire in 1861 to 17,000 in 1911 and 18,600 in 1913. But not all of that was handled by merchants; Table 7, col. 1 collects the part that was, that is, the estimated production, transportation, and import series reduced by the allowances for the appropriate exclusions. These exclusions, roughly estimated, correspond in principle to the final products' value added, or gross value, depending on whether or not merchants (presumably) handled its raw materials; but the focus here is on the relevant aggregate rather than its internal distribution, and in practice the deductions are allocated as computationally convenient.

The components of the total in Table 7, col. 1, presented in cols. 2−10 and 16−20, are obtained as follows. Col. 2 refers to agricultural products. In 1911, on-farm consumption and direct ("farmers' market") sales may have accounted for some 42 percent of the harvest-corrected agricultural product (7,877 million lire, from Table 4, col. 1), a share suggested by Federico's gross-saleable-product figures (Rey 2000, p. 19), assuming that merchants acquired 100 percent of forage crops, 75 percent of cereal, citrus, meat, milk, and wood and forest products, 50 percent of wine, olive oil, industrial vegetable products (e.g., sugar beet, textile fibers), and other animal products (e.g., eggs, silk cocoons), 20 percent of vegetables, legumes, and hunting/fishing products, and 10 percent of (other) fresh fruit. The time series in col. 2 applies the residual 58-percent share to the entire harvest-corrected agricultural product series in Table 4, col. 1: absent a full account of Federico's sources and methods, one can do little more than that.

Table 7, col. 3 refers to the extractive industries. The deduction from Table 1, col. 2 refers to the exported metal ores, notably (Elban) iron ore and (Sardinian) zinc ore, presumably sold directly by the mine to the foreign processing plant, without the commercial organization that appears to have characterized, for example, the sulphur-mining industry. The deduction sums over zinc ore

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productivity estimate for 1911 is biased upward by their massive understatement of industrial employment (above, Fenoaltea 2020b, §3.4, footnote 16 and references therein), save of course for compensating errors (e. g., an underestimate of the capital stock in 1938). The technologically progressive sectors (agriculture, industry, transportation) represented some two-thirds of the economy, for a 3-percent p.a. productivity growth in the (commodity) production of interest here with 2 percent economy-wide, and near 4 percent with 2.5 percent economy-wide.

[44] For an earlier, analogous case see Fenoaltea (1988a), p. 308.

production (Fenoaltea 2015b, Summary Table B.1, col. 8), as practically none was reduced in Italy, and, ignoring inventories presumably held at the mine, iron ore exports as reported by the *Movimento commerciale*, both valued in conventional terms (ibid., Summary Table B.2, panel B1).

Table 7, col. 4 refers to the food industry, about which very little is (by the present author) currently known. An estimate of the deductibles in 1911 is derived from the author's value added estimates in Rey (1992), pp. 119–120, as follows. Value added in wheat and corn milling is reduced by 25 percent to allow for contract milling of grain for on-farm consumption. Value added in the manufacture of bread, pasta, and biscuits is reduced by 95, 50, and 70 percent, respectively, to allow for artisans' direct sales to the public; these ratios reflect the ratio of large-shop employment (*Censimento industriale*, vol. 3) to the total labor force (*Censimento demografico*, vol. 4) in categories 3.34, 3.35, and 3.56, corrected to allow for productivity differentials. Value added in the manufacture of cheese and conserved meat (ham, salami, etc.) is reduced by 90 percent, on the presumption that the bulk of these were actually produced by farmers and again sold directly to the public. Together, these deductions total 42 percent of the 827 million lire value added attributed to the food industry in 1911. To allow for the progressive growth of non-artisanal production an "early" benchmark is also calculated, increasing the deducted shares to 90 percent for pasta and biscuits, and 95 percent for cheese and conserved meat; with these "early" shares the deductible share of 1911 value added rises to some 46 percent. For simplicity, Table 7, col. 4 is the food-industry total value added (Table 1, col. 3) reduced by a share set equal to .42 in 1911, and extrapolated assuming a constant growth of .001 from year to year; the "early" .46 benchmark share is accordingly attributed to 1871. Food-product exports such as pasta and canned tomatoes were also significant by the end of the period at hand; they are here neglected, implicitly assuming that the exporters were in fact merchants rather than the producing firms.

Table 7, cols. 5 and 6, referred to the tobacco and textile industries, reproduce the corresponding value added series in Table 1, with no deduction: a safe enough bet for tobacco products, possibly an overestimate for textiles, at least over the later decades, as it implicitly assumes that the by then significant exports were handled by merchants rather than directly by the producing firms.

Table 7, col. 7 refers to the apparel industry, here restricted to the industrial production of finished textile goods on the one hand and caps and hats on the other (Fenoaltea 2019, Summary Table H.3, cols. 9 and 10). Both groups were heavily artisanal; but the production of headgear seems to have been heavily concentrated, and presumably marketed through a network of merchants, while the production of finished textile goods was very widespread and the goods were presumably sold, in large part, directly to the public. In 1911, comparing as before the latter industry's large-shop employment and labor force (census categories 6.91 and 6.92), some 90 percent of the product seems to have avoided intermediation; and that figure too was presumably marginally higher in earlier times. For simplicity, Table 7, col. 7 reduces the aggregate in Table 1 by a share of finished-textile-good total value added (Fenoaltea 2019, Summary Table H.3, col. 9) set equal to .90 in 1911, and extrapolated again assuming a constant growth of .001 from year to year (whence a share of .94 in 1871).

Table 7, col. 8 refers to the leather industry. The deduction with respect to Table 1, col. 7 includes two components, the first of which is the entire value added in shoe repair (Fenoaltea 2019, Summary Table H.3, col. 15, included as noted in Table 1, col. 7). The other is an allowance for the share of new goods produced by artisans and sold directly to the public, whether made to order or not; it is here very tentatively set equal to a constant 15 percent of value added in the production of new final goods (Fenoaltea 2019, Summary Table H.3, col. 14 less Summary Table H.1, col. 54, allowing 1,330 lire per ton of leather), an estimate that grows quite regularly from some 15 million lire in 1861 to 28 in 1911.

Table 7, col. 9 refers to the wood industry: it was essentially artisanal (even in 1911, only some 56,000 members of the 415,000-strong labor force were employed in large shops, Rey 1992, p. 143), but how and to whom the artisans sold their products is anybody's guess. To contain the possible error col. 9 is here obtained very simply as half the corresponding value added series in Table 1, col. 8.

Table 7, col. 10 refers to the metal industry; it is the series in Table 1, col. 9, reduced only to allow for the railway companies' (presumed) direct purchases (other deductions are taken later, in valuing metal products). The deduction applied here is the output of rails (Fenoaltea 2015e, Summary Table E.1, col. 2), weighted by 69.12 lire per ton (48 lire value added per ton of rails, times 1.2 to allow for more complex pieces, plus 1.2 squared times the 8 lire per ton of pig iron, ibid. section E02.04).

Table 7 cols. 11–16 refer to the (predominantly metal) products of the engineering industry. Cols. 11–15 refer to specific deductions, all subtracted from Table 1, col. 10 to obtain the net figure in col. 16. Col. 11 refers to ships; the deduction, estimated presuming that merchants were involved only in supplying wood, is the sum of the following components. The first refers to new naval vessels; it is the sum of the 13 type-specific displacement-tonnage production series (Fenoaltea 2015f, Summary Table F.1, cols. 2–14), weighted by the corresponding estimates of unit values (respectively 2,000 lire for armored sail-powered fighting ships, 2,700 lire for other sail-powered fighting ships, 2,300 lire for battleships, 2,600 lire for armored cruisers, 2,800 lire for protected cruisers and the like, 3,100 lire for torpedo cruisers and the like, 3,600 lire for destroyers, 5,300 for submarines, 4,700 lire for torpedo boats, 1,400 lire for gunboats, 1,300 lire for tugs, 400 lire for bulk transports, and 900 lire for other auxiliaries), reduced by the estimated value of the wood consumed (ibid., Table F.20, col. 6, here valued at 100 lire per ton). The second component is the value added in naval maintenance (ibid., Summary Table F.1, col. 30), for simplicity not further adjusted. The third component refers to new merchant vessels; it is the sum of the two (sail, steam) gross-register-tonnage production series (ibid., Summary Table F.1, cols. 15–16), weighted by the corresponding estimates of unit value (respectively 327 and 604 lire per gross ton, ibid., section F02.03), again reduced by the estimated value of the wood consumed (ibid., Table F.20, col. 7, here valued at 100 lire per ton). The fourth component is the value added in merchant-ship maintenance (ibid., Summary Table F.1, cols. 30), augmented to include the value of replacement sails (Fenoaltea 2018, Table A3, col. 3, valued at 4,000 lire per ton, ibid.).

Table 7, col. 12 refers to rail-guided vehicles; the deduction is obtained, much like col. 10, as the sum of two components. The first refers to new vehicles; it is estimated as the value of new locomotives, passenger cars, and freight cars (Fenoaltea 2015f, Summary Table F.1, cols. 17–19, weighted by unit values equal respectively to 1,640, 1,400, and 690 lire per ton, ibid., section F03.08), reduced by the estimated value of the wood consumed (ibid., Table F.38, col. 5, again valued at 100 lire per ton). The second component refers to maintenance; it is the aggregate value added estimate (ibid., Summary Table F.3, col. 10), augmented by 20 percent to allow for (directly ordered) materials.

Table 7, col. 13 refers to other general equipment, again including new goods and maintenance. The deducted maintenance component is simply the estimated value added (ibid., Summary Table F.1, col. 43), again augmented by 20 percent to allow for (directly ordered) materials. The deducted new-product component is identified with the value of structural components, calculated as the estimated tonnage (ibid., col. 21) at 650 lire per ton (ibid., section F04.06), plus, at a guess, half the value of general machinery (ibid., Summary Table F.1, cols. 20 + 22), valued at 1,300 lire per ton (ibid., section F04.06).

Table 7, col. 14 refers to precision equipment. New goods were presumably acquired, at least in the main, from specialized shops; col. 14 accordingly refers only to deducted maintenance (ibid., Summary Table F.3, col. 12), augmented by 5 percent to allow for (directly ordered) materials.

Table 7, col. 15 refers to fabricated metal, again including new goods and maintenance. The deducted maintenance component is simply the estimated value added (ibid., Summary Table F.1, col. 8); the deducted new-product component is estimated, at a guess, as 10 percent of estimated value added (ibid., col. 1).

Table 7, col. 16 transcribes the net estimates for the engineering industry, obtained as noted by deducting the sum of cols. 11−15 from Table 1, col. 10.

Table 7, col. 17 refers to other manufacturing, obtained from Table 1 as the simple sum of cols. 11–14; all these products are assumed to have been distributed by merchants, to a negligible approximation. On the other hand, the products of the construction and utilities industries did not enter the merchants' inventories; the industrial-products total in col. 18 is accordingly the simple sum of cols. 3–10 and 16–17.

Table 7, col. 19 refers in turn to the relevant value added in inland transportation; it is here calculated as the estimated total (Table 5, cols. 4 + 5), reduced by an allowance for passenger transportation (by rail). That allowance is crudely set equal to 35, 75, and 100 percent, respectively, of the value added attributed to railway, machine tramway, and horse tramway transportation (Table 5, col. 1, 2, and 3). The railway share reflects the passenger share of revenues (38 percent) and passenger-car share of axle-kilometers (33 percent) on the State railways, as reported in the *Annuario 1913*, pp. 233, 235; the others are no more than reasonable estimates. Other passenger transportation is neglected; and so is the carting of goods that did not enter merchants' inventories, a very small proportion of the total judging by the tonnage estimates in Table 6.

Table 7, col. 20 refers, finally, to the imports acquired by merchants; direct documentation is practically non-existent, but it is a fair presumption that major users of imports ordered them directly in international markets. The deductions from aggregate recorded imports (Fenoaltea 2018, Table A1, cols. 6 + 7) are collected in Table 8, and obtained as follows.

Table 8, cols. 1 and 2 refer to agricultural products. Col. 1 refers specifically to vegetable and animal textile fibers. For simplicity, the quantity series used here are the readily available net import series; the negative (net export) figures are corrected to zero (as are the flax net import figures through 1900, as flax-spinning was then not yet mechanized). The source series are Fenoaltea (2019), Tables H.02, col. 3 (cotton), H.06, col. 2 (wool), and H.16, cols. 2 (jute), and 3 (flax); hemp was always exported. The corresponding 1911 import prices are respectively 1,900, 3,800, 600, and 1,300 lire per ton. Col. 2 refers instead to tobacco leaf (for the State monopoly); the quantities are those reported by the *Movimento commerciale*, valued at the 1911 import price of 1,680 lire per ton.

Table 8, col. 3 refers to the products of the extractive industries, and specifically to coal, excluding that already included in the above deductions for finished products of the engineering industry. It includes all the coal consumed by the railways and, at a guess, one-third the coal consumed by thermal power plants, gas-works, kilns, chemical plants, and sugar refineries. The quantity series used here are simply those in Fenoaltea (2015f), Table F.51, cols. 3–4, 6, 8, and 12, and Fenoaltea (2015g), Table 1, col. 9, allowing 1,000 tons of coal per million kWh; gas coal is valued at 26,50 lire per ton, the rest at 35,65 lire per ton (Cianci 1933, p. 307).

Table 8, col. 4 refers to imports of tobacco products, again presumably purchased directly by the State monopoly. The quantity series is simply the aggregate of the various (and frequently reclassified) final products reported by the *Movimento commerciale*. In 1911 such imports equalled near 28 tons of cigars and cigarettes, and under 4 tons of other finished tobacco products, worth 35,000 and 7,000 lire per ton, respectively; the aggregate tonnage figure is weighted by 32,000 lire per ton, the approximate average value per ton in 1911.

Table 8, col. 5 refers to textile-industry products, and specifically to the imports of thence factory-processed goods. Proceeding as above, col. 5 is obtained as the positive elements of the net-import quantity series for cotton yarn, carded wool, combed wool, woollen yarn, worsted yarn, combed jute, combed flax (after 1900), and jute yarn (but not linen yarn, as net imports did not materially increase after 1900). The source series are those in Fenoaltea (2019), Tables H.02, col. 5, H.07, cols. 3–4, 6–7, H.16, cols. 6–8 and 10. The 1911-price unit value of cotton yarn (73.24 million lire per trillion meters) is inferred from domestic production, approximating the value of output as the value of 185,700 tons of raw cotton (at 1,900 lire per ton) plus a spinning value added of 73.448 million lire, and dividing by the yarn output of 5.82 trillion meters (Table H.02, cols. 1, 3 and 9, and summary Table H.2). The other unit values, per ton, are the import values in the *Movimento commerciale 1911*: 5,400 lire for carded wool, 5,400 for combed wool, 6,500 for woollen yarn, 8,100 for worsted yarn, an estimated 650 for combed jute, 1,850 for combed flax, and 800 for jute yarn.

Table 8, col. 6 refers to engineering-industry products. Its first component refers to ships; it is not the value of imports, but the value of imports that happened to be included in the reported total (Fenoaltea 2018, Table A1, col. 8). Its second component refers to railway vehicles; it is obtained as the sum of (the positive elements of the net import series in) Fenoaltea (2015f), Table F.34, cols. 2, 5, and 8, again weighted by 1,640, 1,400, and 690 lire per ton, respectively. The third component refers to machine parts, imported for assembly; the base quantity series is ibid., Summary Table F.1, col. 20. Imported machine parts were relatively expensive (ibid., section F04.06); at 1911 prices they are here tentatively allowed 1,800 lire per ton. The fourth component refers to assembled general machinery. The base quantity series is ibid., Table F.45, col. 24; it too is here tentatively halved, and weighted by 1,300 lire per ton. The series in Table 8, col. 6 is the sum of these four components; precision-equipment production was small-scale, and imports too are presumed to have been handled by merchants.

The imported products of the other industries are also assumed to have been handled by merchants, to a negligible approximation; the estimated total 1911-price value of deductible imports in Table 8, col. 7 is the simple sum of cols. 1–6

Table 7, col. 20 – the estimated 1911-price value of the imports acquired by merchants – is accordingly obtained as aggregate recorded imports (Fenoaltea 2018, Table A1, cols. 6 + 7) less Table 8, col. 7. With col. 20 finally in place, one can estimate the aggregate annual additions to the merchants' inventories (col. 1) as the sum of cols. 2 and 18–20. That aggregate series here serves a twofold purpose. On the one hand, as noted above, the point estimate for 1911 serves to pin down the likely value added of the commerce-proper sector in 1911. On the other, Table 7, col. 1 is here used to extrapolate the estimated value added of the broad "commerce" sector in 1911, equal to (249.2 + 164.0 + 1,020.9) = 1,434 million lire; the resulting series appears in Table 1, col. 20.

4.4 Net banking and insurance

The two extant series for the banking and insurance sector (net of double-counted business services), and the new one (Table 1, col. 21), are illustrated in Figure 1, panel C3. In brief, the present author's 2005 series extrapolated the revised "benchmark" net sector estimate of 77 million lire in 1911 (Rey 2000, pp. 366–367) using the few census labor-force data points (adjusted by Vitali's declining share of double-counting) to determine the trend, and construction data to infer short-term movements. Baffigi's sesquicentennial series extrapolates that same benchmark, using the new (sesquicentennial) current-price series for insurance and for the banking-sector, deflated by the centennial price index. The author's new series abandons the "benchmark" estimates: it is based directly on the new current-price series, but simplifies the intermediate net/gross estimates, and

deflates the net series with a wage index.[45] This new series resembles Baffigi's far more than the author's own earlier estimates, as both the recent series incorporate the additional material contributed for the sesquicentennial.

The details of the matter are relatively complex. Baffigi (2015), p. 109, refers to new gross current-price series for insurance on the one hand and for banking on the other: the former taken from Battilani, Felice, and Zamagni (2014) and based on firm-level data, the latter the work of Riccardo De Bonis, Fabio Farabullini, Miria Rocchetti, and Alessandra Salvo, all of the Bank of Italy (De Bonis *et al.* 2012).[46] The gross constant-price series are said to have been obtained by deflating these current-price series using the corresponding "centennial" price index, actually a combination of the wholesale and retail price indices (Fuà 1969, p. 472). Baffigi seems not to discuss the distinction between gross and net value added.

Banking and insurance need here to be distinguished. Battilani, Felice, and Zamagni (2014) reconstructed the current-price insurance series, conserving the "benchmark" estimate of 69 million lire in 1911 (but raising that for 1891 from 21 million lire to 24 million: pp. 31–35, 71–72, Rey 2000, pp. 265, 367); Baffigi's work sheets confirm that that is the series he used, as suggested by his text. Battilani, Felice, and Zamagni (2014) include a current-price credit series (pp. 71–72), which is attributed (p. 7) simply to De Bonis *et al.* (2012); and this would sit well with Baffigi's indication that he used the De Bonis *et al.* series, taking it from Battilani, Felice, and Zamagni (2014), were it not for the fact that the series in Battilani, Felice, and Zamagni (2014) is not the lire equivalent of the euro series in De Bonis *et al.* (2012), and Baffigi's is yet another one.[47] The ratio of the Battilani-Felice-Zamagni series to the (lire) De Bonis *et al*. series is near 140 percent in the early 1860s, declines to near 80 percent in 1891–99, and then drifts back up to some 88 percent in 1910–13; that of the Baffigi series to the Battilani-Felice-Zamagni series is near 60 percent in 1861–70, drifts up to exactly 100 percent in 1891 and then a bit more, and returns to exactly 100 percent in 1911. The most instructive ratio is that of the Baffigi series to the (lire) De Bonis *et al*. series: a constant 82 percent in 1861–91, followed by a linear increase to 88 percent in 1911.[48] Baffigi used the De Bonis *et al.* series, but forced it through the Battilani-Felice-Zamagni 1891 and 1911 benchmarks (respectively 86 million and 219 million lire: again the "benchmark" figure for 1911, but just under the 87/88-million "benchmark" for 1891, Rey 2000, pp. 265–266, 367).

Here, the (lire) De Bonis *et al*. current-price credit series is accepted essentially as is: it is by all accounts a careful reconstruction based on direct firm-level evidence, and there is no obvious

[45] The new series differs from that in Fenoaltea (2017a), which used Baffigi's net shares. That series also introduced a further refinement, reducing the allowance for double-counting (and inflating the "net" figure) to allow for the value added estimates obtained for various business sectors as the sum of the returns to the primary factors of production, and therefore in principle already net of purchased business services. Upon reflection, however, those estimates incorporate returns to capital extrapolated from those of other sectors, calculated as sales less raw materials less labor costs; in practice, therefore, even the value added estimates that are net of business services in principle appear to include them in practice, and that refinement is here abandoned. The banking-and-insurance sector is a small one, and not much is here at stake.

[46] The reference is to the Italian version of the De Bonis *et al.* working paper, n. 26 in the Bank of Italy series; the English-language n. 26 is actually a different paper, without the value added series.

[47] The euro/lire conversion rate is the standard 1,936.27 lire/euro.

[48] Since the ratios among the series vary smoothly, their short-term movements are very similar, and clearly those of the De Bonis *et al*. series.

reason to force it through earlier, less robust "benchmark" figures. The only, minor modification is the exclusion of the estimates for the *Cassa Depositi e Prestiti*: this to avoid double-counting, as Battilani, Felice, and Zamagni include that institution in the government sector (De Bonis *et al*. 2012, pp. 50–54; Battilani, Felice, and Zamagni 2014, pp. 7, 69–70).[49] The current-price Battilani-Felice-Zamagni insurance series is also accepted as is, as it was by Baffigi: little is known of its actual content, and no useful correction suggests itself.

The sum of these two series is the present estimate of the sector's current-price value added, at current borders; it is tentatively converted to constant borders by inflating it by 5 percent in 1861-66 and 3 percent in 1867–70, not that this correction matters much.

The double-counted and net components of that value added raise issues of a different order, not least because the evidence that can be brought to bear is desperately thin. Istat's centennial series' net share, apparently anchored by benchmark calculations for 1871–73 and 1938 (*Reddito nazionale*, pp. 144, 232–234), displays nonsense variations in the early 1860s, relatively slow trend growth from ca. 9 percent in 1866 to ca. 13 percent in 1884, pops up to ca. 17 percent in 1887, and the again grows slowly to some 23 percent in 1910–12, slipping to 20 percent in 1913; this last dip is incongruous, as is the *upward* trend shift in the mid-1880s (when the construction boom presumably increased the share of business business). Vitali's constant-price series seem simply to deflate the Istat series with a combination of the wholesale and retail price indices (Fuà 1969, p. 472), maintaining their proportions (within rounding and possibly typographical error). Zamagni's initial benchmark allowed credit and insurance in 1911 a gross value added of 344 million lire and a net one of 95 million, or some 28 percent, calculated by examining the composition (households and not) of the sector's business (Rey 1992, pp. 222–223). The revised figures for 1911 reduced these to 288 and 77 million lire, respectively, for a net share of 27 percent; the corresponding 1891 benchmarks were 110 and perhaps 29 million lire (26 percent), respectively (Rey 2000, pp. 265–266, 367).[50] The present author's 2005 estimates drew on Vitali's time series in the centennial corpus; Baffigi apparently used Istat's centennial double-counted shares, forcing the series through his "benchmarks" (the new one for 1871, Vitali's "benchmark" figures for 1891 and 1911).

When all is said and done, the net share of value added can reasonably be assumed to have grown slowly over time, but its short-term variations remain unknown. Here, that share is assumed to have equaled the "benchmark" 27 percent figure in 1911, and simply half that forty years earlier, in 1871; the other years' net shares are obtained by linear interpolation and extrapolation.

The resulting net-credit-and-insurance current-price value added series needs to be converted to a 1911-price series. Baffigi used the "centennial" deflator, as noted a mix of the wholesale and retail price indices. A purported improvement to the latter index may be found in Fenoaltea (2002), but the more relevant question is whether it is in fact the right index to use at all. The present measures are 1911-price measures, in principle product-quantity series weighted by 1911-price value added per unit. The path of product quantity is at times observed ("tons of pig iron"), at times inferred from the path of the labor input corrected for productivity growth; when productivity growth is negligible, as (it would seem) in the case at hand, the labor-input figures are used directly (as in the present author's 2005 estimates for this particular sector, recalled in the first paragraph of this section). To maintain consistency, the current-price series is here deflated by a wage series, in effect converting current

[49] The nonsense figures for the *Cassa* on p. 70 of Battilani, Felice, and Zamagni (2014) are presumably due to a copy-paste error.

[50] The material in Rey (2000), pp. 265–266 is particularly murky, as the figures in the tables disagree with each other and with the text. Baffigi opted for a net value added of 28 million lire in 1891.

values into a labor-input series; since the relevant workers were urban rather than rural, the selected deflator is the nominal industrial-wage series in Fenoaltea (2002), Table 6, col. 1, shifted to set 1911 = 1.[51]

4.5 Miscellaneous services

The two extant series for the miscellaneous-services sector, and the new one (Table 1, col. 22), are illustrated in Figure 1, panel C4.[52] If the sesquicentennial services series are overall a step sideways, the miscellaneous-services series *uti singula* appears to be a clear step backwards.

The time series in Fenoaltea (2005) extrapolated the revised 1911 benchmark (Rey 2000, p. 368) using labor-force figures for 1871, 1881, 1901, and 1911: the last three as rendered homogeneous over time (Vitali 1970), the first reconstructed, on a comparable classification, directly from that year's census. These were grouped into four broad categories – professions; health, entertainment, and education; clergy; residual – weighted by their approximate 1911 incomes (those used to generate the 1911 benchmark), and summed to four census-date equivalent totals, which were then geometrically interpolated and extrapolated. It bears notice that the total labor force grew from census to census, but very slowly (+2.1 percent from 1871 to 1911): the significant growth of estimated constant-price value added (near +24 percent from 1871 to 1911) is due almost entirely to a composition effect, to an upward shift across skill levels, in essence to the growth of human capital (Fenoaltea 2005, pp. 309–312).

For the sesquicentennial project, Battilani, Felice, and Zamagni (2014) produced a current-price series (ibid., pp. 67–68) by mating disaggregated annual employment and income series. Most of their effort was devoted to the income series (ibid., pp. 36–45, where they distinguish 7 categories within the miscellaneous group). The employment series was derived from four census-year labor force benchmark figures, Vitali's from 1881 and a census-based estimate for 1871, exactly like the preceding 2005 series; to generate annual series they geometrically interpolated and extrapolated the category-specific benchmark ratios of the labor force to the total population (ibid., p. 35). Their aggregate series displays noticeable short-term variation, which can come only from the income side; its path reveals the influence of the centennial cost-of-living index.

Baffigi (2015), p. 109, indicates that he took over the Battilani-Felice-Zamagni series, and used their category-specific employment series to estimate the constant-price aggregate; those series are not in the public domain.[53] Three features of his estimate hit the eye. First, like the 2005 series, it generally grows very smoothly, as one would expect of a series built up from a mere handful of benchmarks. Second, it displays an incongruous dip and recovery between the last two benchmarks;

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[51] Baffigi's cost-of-living deflator converts current values into a general basket of goods, and not, as here, into sector-specific equivalent labor (and product, absent productivity growth). Baffigi's deflator would be suited to "third-generation" (1911-price *level*) estimates, but is unsuited to his, and these, "second-generation" (1911-price) estimates (Fenoaltea 1976, 2020b). Constant-price series neglect differential technical progress, with the result that as one goes back in time they tend to overstate the relative size of the lagging-productivity sectors (Fenoaltea 2011b).

[52] The new series differs from that in Fenoaltea (2017a), which did not deal separately, as the estimates now do, with the maintenance of textile goods.

[53] Nor are they present in his work sheets, which include the constant-price series itself as a source series. It bears notice that Baffigi did not here choose, as he did elsewhere, to deflate the current-price series by the corresponding centennial price index.

those of us who have encountered that problem before recognize it as the common and in principle spurious result of interpolating an aggregate by summing the geometric interpolation of its components, when their growth rates are, as here, of opposite sign (Fenoaltea 2020a, §2.3). The third is that his benchmark 1901 and 1911 estimates are practically the same (which is what highlights the second issue just mentioned, as it would otherwise be swamped by the general increase). The (accelerated) shift in the mix towards higher-level professions is clear in the census data (Fenoaltea 2005, p. 312): that Baffigi's series fails to register it points to a computational error of some sort.

The new series returns in essence to the 2005 series, which seems sounder than Baffigi's; but it incorporates two improvements. The first improvement separates out textile-maintenance services, estimated in their own right (Fenoaltea 2019, Summary Table H.1, col. 42); the new series in Table 1, col. 22 is the simple sum of that maintenance series and the new estimates for the residual, derived as described below. The reasons for this separation are, first, that that component (alone) contains a slow but perceptible growth in productivity, tied presumably to the diffusion of public and private wash-stands; second, that Vitali (1970, p. 306) attributed to the maintenance of textile products in 1911 only some 69,000 individuals (out of over 115,000 in census category 6.95), a clear underestimate in light of the earlier census figures (the *Censimento 1901* listed some 95,000, categories XII.9–10, the *Censimento 1881* 97,000, categories III.II.3–4, the *Censimento 1871* 62,000, categories XII.9–10; Fenoaltea 2019, section H07.06).

To reflect this exclusion, the census-year labor-force estimates (from Vitali 1970, extended to 1871) in Fenoaltea (2005), Table B.2 are amended: the "residual" figures in row 5 are reduced, excluding the textile-maintenance workers Vitali counted, to 654 thousand in 1871, 631 in 1881, 616 in 1901, and 605 in 1911, the weighted sector totals in row 6 to 222 thousand in 1871, 226 in 1881, 238 in 1901, and 276 in 1911. The unweighted totals become practically flat (954 thousand in 1871, 924 in 1881, 931 in 1901, and 968 in 1911): again, growth was a matter of an improvement in composition, in the progressive skilling of the labor force.

The correction of Vitali's underestimates entails a revision of the 1911 "benchmark" value added estimate of 1,095 million lire, here again taken as a starting point.[54] The ex-textile-maintenance total is set at 1,060 million lire, reducing the "benchmark" 1,095 million lire in proportion to the reduction in the corresponding weighted total labor force (from 285,000, Fenoaltea 2005, Table B.2, col. 6, row 6, to the present 276,000); the textile-maintenance total, taken directly from the Fenoaltea (2019) time series, is set at 27 million lire. The new total is 1,087 million lire, paradoxically below the estimate based on Vitali's underestimated labor force. The reason for this is straightforward: the "benchmark" estimate treated the overwhelmingly female textile-maintenance labor force as full-time workers, the present estimates (taken from Fenoaltea 2019) assume, more plausibly, that those women were also home-makers, and "worked" (in the market) only half-time. Vitali excluded less than half the likely total, and the increase in their numbers is outweighed by the reduction in their per-capita value added.[55]

The ex-textile-maintenance 1911 benchmark is extrapolated using the above weighted-total benchmark estimates of the corresponding labor force, as was done with the comprehensive

[54] The 1911 "benchmark" estimate is based on labor-force numbers (from Vitali 1970) and inevitably rough estimates of annual earnings by profession (Rey 2000, p. 368). These last are here presumed gross of the rental value of professional offices; the text (p. 367) suggests that the estimate includes pharmacists (here included elsewhere), the table suggests otherwise.

[55] The "benchmark" estimate of 1,095 million lire reduced Istat's "centennial" estimate (1,141 million lire) by 4 percent (Rey 2000, p. 245); the present estimates increase the reduction to 5 percent.

benchmark in Fenoaltea (2005); the improvement here relaxes the assumption that growth rates were constant from benchmark to benchmark, and assumes rather that they displayed some sensitivity to broader economic, and specifically labor-market, conditions.[56] Over the longer term, to be sure, rising real wages directly augmented families' capacity to invest in the children's education, and there was most likely an independent trend component to the growth of human capital. Over the shorter term, of concern here, rising *nominal* wages are a symptom of labor-market tightness, and, with that, of workers' opportunity to train, if only on the job, for positions otherwise reserved to the already better-trained; falling nominal wages, analogously, are a symptom of slack demand for labor, a situation in which people will accept positions for which they are overqualified.

The algorithm used to generate the new 1911-price series accordingly interpolates and extrapolates the ex-textile-maintenance weighted-labor-force benchmarks with the usual industrial wage series (Fenoaltea 2002, Table 6, col. 1, 2011a, p. 125), imposing an elasticity correction rather than a trend correction (Fenoaltea 2020a, §2.3).[57] The equivalent-labor-force annual series so obtained is then rescaled to set 1911 = 1 and multiplied through by the ex-textile-maintenance 1911 benchmark value added figure (1,060 million lire).

The ex-textile-maintenance 1911-price value added series so obtained is then summed to the textile-maintenance series in Fenoaltea (2019); the result is the new sector series in Table 1, col. 22.

4.6 Buildings

4.6.1 Introduction

"Buildings' services" actually refers only to *residential* services, as the actual or imputed rents of non-residential structures are included in the using sector's value added (e.g., Rey 1992, p. 289). The two extant series for the buildings'-services sector, and the new one (Table 1, col. 23), are illustrated in Figure 1, panel C5. Like the sesquicentennial miscellaneous-services series, the sesquicentennial buildings-services series appears to be a step backwards.

The present author investigated the construction industry in the 1980s (Fenoaltea 1987). The sources then reviewed included the census room-count data; the estimated benchmark aggregates pointed to a rise in the medium-term growth rate of the housing stock around the turn of the century, but little else. The more useful sources were the high-frequency tax data, in particular on assessed rental values, which yielded annual new-construction and maintainable-stock series for the period at hand (Fenoaltea 2015h). These data pointed to sharp cyclical movements in new construction, and an unprecedented boom in the years before the Great War (driven, it appears, not by demography but by finance, Fenoaltea 1988c): the stock series grew with typically short-lived deviations from trend, and a perceptible acceleration over its final decade or so (Fenoaltea 1987, 2005).

The "benchmark" project yielded, in the first instance, Zamagni's value added estimate for 1911. A rent pool of 1,388 million lire was obtained from a census-derived room count attributed to the present author and evidence on site-specific rents per room; allowing 121 million for maintenance and administrative expenses, value added was estimated at 1,267 million lire (Rey 1992, pp. 234–

[56] Fenoaltea (2017a) performed a similar exercise, but the algorithm was needlessly complex.

[57] The annual growth rate of the labor force is estimated as that of the wage, scaled by the ratio of average annual labor-force growth to average annual wage growth, with both averages computed over the appropriate intercensal period (or the nearest intercensal period, when extrapolating beyond 1871–1911).

236).[58] In the second round a current-price estimate was constructed for 1891; the estimate for 1911 was not revised (Rey 2000, pp. 273–275, 384–369). The 1891 estimate, we are told, transformed the 1911 room stock "with the aid of the investment series in Fenoaltea (1987)" and the 1911 average rent with that of the rent index from the same source.[59]

The present author's 2005 building-services estimates took the "benchmark" 1911 value added figure at face value, and extrapolated it in proportion to the estimated stock of private buildings maintained (not limited to, but presumably overwhelmingly dominated by, residential structures).

The sesquicentennial Battilani-Felice-Zamagni current-price series is said to mate a room-stock series – Vitali's centennial estimates "based on the census data and interpolated with the trend of the population series" (with a correction for the early border changes, Battilani, Felice, and Zamagni 2014, pp. 48–49) – and the present author's rent index.[60] The current-price series incorporates the earlier benchmarks for 1891 and 1911, obtained from the different sources recalled above: serendipity has its limits, and something unspecified was surely bent to fit.

Baffigi sheds some light on the matter. His 1911-price series, we are told, is the current-price series, deflated by the rent index used to construct it (Baffigi 2015, p. 110): it is in principle the Vitali/Battilani-Felice-Zamagni room-stock series itself. In fact, comparing Baffigi's and Vitali's series, both reduced to index form with 1911 = 1, one finds that Baffigi's is a constant 6.25 percent above Vitali's from 1871 to 1891, and then declines to meet it by 1911. The real index undergoes a forced deceleration to incorporate the earlier benchmarks, a deceleration that obliterates the acceleration evident in the data that inform both Vitali's estimates and the present author's.[61]

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[58] Zamagni applied her rent figures to (a total) 21,221,000 inhabited rooms, a number obtained from the estimated total number of rooms (24,992,000) by deducting empty rooms (3,281,000) and rooms used as offices (490,000); all these figures are said to come from p. K7–19 of the present author's ms. (the ms. pages numbered "K7" are those covering chapter K07, Fenoaltea (2015h), pp. 82–92; on the census-based estimates see in particular section K07.05, pp. 87–92). The cited text actually states that "empty" there *includes* offices, and that the estimated number of *inhabited* rooms is (24,992,000 – 3,281,000) = 21,711,000 (ms. p. K7–17, now Fenoaltea 2015h, p. 89). The additional 490,000 rooms used as offices (explicitly attributed to the present author, Rey 1992, p. 235, footnote 37) are nowhere mentioned in the quoted source, and the origin of that figure remains obscure.

[59] The room count (number of rooms) and the investment series (million of 1911 lire) need to be linked by a third element, which is not specified. The source of the cited alternative – "Fenoaltea's census-based estimate for 1891" – is again mysterious.

[60] The annual stock estimates in Fenoaltea (2005), like the rest of that paper, are resolutely ignored (above, §4.1); from the author's entire work on the construction industry Battilani, Felice, and Zamagni cherry-picked the noted minor bits, and set the substance aside. As had been pointed out the population series is a poor index of the housing stock: because construction appears to have been finance-sensitive rather than population-sensitive (as noted above), and again because the population series itself appears to misrepresent demographic growth, as the migration estimates used to derive annual population figures from the census benchmarks were obtained through a defective algorithm (Fenoaltea 1988c, pp. 614, 635–637).

[61] For the period at hand Baffigi's work sheets contain only the current- and constant-price series, and the rent index; as the constant-price (stock) series departs little from its trend, while the rent series displays a strong cycle, the cyclical movements of the current-price series stem overwhelmingly from the latter. What is not clear is what exactly Baffigi received from Battilani, Felice, and Zamagni, and who did what to what; a likely scenario is that they themselves forced the current-price series through the benchmarks, that Baffigi then simply deflated it with the cited index, and that the imposed deceleration was thus passed into his constant-price series. Baffigi's rent index is also something of a *curiosum*: from 1872 to 1890 it closely tracks the

In the circumstances, the sesquicentennial series does not appear to improve on its immediate predecessor (Fenoaltea 2005); but the present estimates would improve on the latter too, amending both the 1911 benchmark and the extrapolating index. The new benchmark, again based on room counts and average unit rents and loosely confirmed by the buildings-tax data, is significantly higher than Zamagni's, in part because it includes the empty rooms to which she implicitly attributed a zero shadow price. The new building-stock index is improved by the removal of a here irrelevant lag, and even more because it now captures, as the earlier aggregate did not, the changing distribution of the stock in favour of the larger cities. The new estimates are thus generally higher, and grow faster, than their 2005 counterparts.

4.6.2 Rents in 1911: a tax-based estimate

Since the present author's construction-industry production estimates for private buildings are derived essentially from the assessed rentals that were subject to tax (Fenoaltea 2015h, chapters K09 and K10), an estimate of the rent pool in 1911 can be obtained from the evidence used to derive them.

Perhaps the simplest approach is to work from the estimates of the maintainable stock of private buildings; these assume negligible maintenance on very new buildings, and correspondingly lag the total stock by a number of years. The total mid-year stock of taxable buildings in 1911, measured by embodied 1911-price construction value added, can be derived by extending Fenoaltea (2015h), Table K.53, col. 30 to 1914 and 1915, using the indicated data and algorithm, and averaging the two; the result equals 3,833 million lire.[62] The total mid-year stock of exempt buildings in 1911, similarly measured, can be derived by extending Table K.58, col. 6 to 1914 and 1915, again using the indicated data and algorithm, and averaging the two; the result equals 1,765 million lire. Using the coefficients in section K09.05, construction value net of land costs is set equal to (1/.34) times value added, and gross rents to (1/15) times construction costs; allowing a further 10 percent for base land costs, the corresponding rental values total some 827 million lire for taxable structures, and 381 million lire for exempt structures, net of site rents. In the case of taxable structures, the overall ratio of actual rents to rents net of site rents can be gauged from the breakdown of (1914) assessments, which included 255.8 million lire in the leading six municipalities, 125.2 million in the other provincial capitals, and 283.6 million lire elsewhere (Table K.53, cols. 14–16). The tax authorities indicated that in 1873 rents per room were in the proportions (8 : 3 : 1) for these three groups (section K09.03, p. 119); dividing the rent totals by these figures one obtains estimates of site-rent-free room rent totals of for the three groups that assign 9 percent of the overall aggregate to the first, 12 percent to the second, and 79 percent to the residual. Multiplying 9 percent of the ex-site-rent 1911 aggregate estimated above (752 million lire) by 8, 12 percent of it by 3, 79 percent by 1, and summing, one obtains an estimate of the rental value of taxable private structures in 1911 equal to 1,546 million lire. Repeating the exercise on the assumption that by 1911 the rent-per-room ratios had grown to (10 : 4 : 1), the estimated total rises to 1,645 million lire; the lower of these two estimates is 1.9 times the ex-site-rent base, the higher 2.0 times that. Exempt structures were overwhelmingly but not exclusively rural (section K09.02; also K10.03), and should accordingly include (only) a modest

present author's, albeit with varying third-digit differences; from 1891 to 1910 it is exactly the present author's for the succeeding year, suggesting an uncaught data-input error.

[62] The maintainable-stock figures for 1914 and 1915 respectively exclude, and include, new construction through 1911. The conceptual imperfections of that average, for present purposes, are that new construction includes that on still incomplete buildings, and that the demolition rate is applied to a stock that is inappropriately shifted; but these are beauty blemishes, and matter little on an ugly face.

quota of site rents; 5 percent is here tentatively added to the above-estimated ex-site-rent base of 381 million lire, for a total of 400 million lire for exempt structures, and 1,946 to 2,045 million lire in all private structures together.

The reduction to exclude non-residential structures is also uncertain. In the late 1880s, workshops appear to have accounted for some 10 percent of assessed rents (section K09.04, p. 127), and, by extension, of actual rents. Allowing a similar ratio for workshops in 1911, and crudely allowing as much again for other commercial space, non-residential structures are here attributed 20 percent of the taxable-structure rent pool, or 309 to 329 million lire, leaving 1,637 to 1,716 million lire to residential structures.

4.6.3 Rents in 1911: a rooms-based estimate

The 1911 benchmark can also be calculated, following Zamagni, from the evidence on rooms and rents per room. The basic sources are two: the 1911 census room counts (*Censimento demografico*, vol. 7), and the rich sample of urban rents provided for 1908 by Ugo Giusti (*Annuario città 1909-1910*). The census reports, for all provincial capitals and other municipalities with over 15,000 persons present – near 300 in all – the number of persons present, the number of dwelling units, their distribution by number of rooms (from 1 to 5 by unit increments, plus 6 and over), and their destination, to wit, inhabited, used for offices, and empty: all this for the municipality's major city on the one hand, and the rest of the municipality on the other.[63] These data were used (in the mid-1980s) to estimate the stock of rooms (Fenoaltea 2015h, section K07.05). The major cities in the census sample included 5.616 million inhabited and .493 million other ("empty") inhabitable rooms, and 7.981 million people; the residual areas of those municipalities, 1.846 million inhabited rooms, .295 million other rooms, and 3.050 million people. Drawing on the more complete data provided by the 1881 census, the number of inhabited rooms per person in those residual areas is considered representative of the rest of the Kingdom, whence an estimated total of 21.711 million inhabited rooms (for 34.671 million people, less the estimated 0.25 percent living in boats, caves, and the like); the number of empty rooms per person appears to have been slightly (9.3 percent) higher in the rest of the Kingdom than in those residual areas, whence an estimated total of 3.281 million empty rooms (including offices), and 24.992 million inhabitable rooms in all.[64]

A marginal extension to those calculations can split out the rooms used as offices. In the census sample, the units' distribution by size points to .166 million rooms used as offices and .327 million strictly empty rooms in the major cities, and .030 million rooms used as offices and .265 million strictly empty rooms in those municipalities' residual areas. The relative magnitude of these last two figures suggests that the 2.493 million "empty" rooms attributed to the rest of the Kingdom included some .254 million offices and 2.239 strictly empty rooms. Overall, therefore, the national 24.992 million room total would include .450 million rooms used as offices, and 24.542 million residential rooms (21.711 million inhabited, and 2.831 million not).[65]

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[63] The rest of the municipality typically included numerous separate small towns, e.g., in the case of Rome, Ostia and Fiumicino on the nearby coast (*Censimento demografico*, vol. 1, p. 443). The residual population of Cesena is reported as 3,686, *corrige* 30,686 (ibid., vol. 7, p. 300*, vol. 1, p. 230).

[64] Absent this small correction, the estimated total number of rooms would be 24.844 million, 3.074 million of them empty.

[65] Zamagni's .490 million offices is thus neither stated nor implied by her ostensible source.

In Table 9, panels A and B, cols. 1 and 4 report the (sample-municipality) major-city and residual population, ordered by major-city population; cols. 2 and 5 report the corresponding total number of rooms, excluding only offices, cols. 3 and 6 the (strictly) empty ones.[66] Giusti provided rent ranges for 6-room elegant and modest bourgeois units, and for 1-, 2-, and 3-room working-class units for 66 cities in 1908. These data are here collapsed into two per-room figures, to wit, one for bourgeois units, and one for working-class units. On the assumption that Giusti's rent ranges correspond to size/quality ranges, and the social pyramid was nearer a ziggurat than a wedding cake, each range is reduced to the average of the end-points, with a double weight on the lower. The bourgeois average is the average of the figures for elegant and modest six-room units, divided by six, again with a double weight on the lower; the working-class average is simply an average for the three size-specific averages, weighted by the number of rooms per unit, as if there were a similar numbers of units in each size class. The resulting estimates are transcribed in Table 9, panels A and B, cols. 7 and 8, in roman.[67]

The split between panels A and B reflects an investigation of the entire Giusti sample, associating the estimated average urban rents (cols. 7 and 8) to the size of the urban population (col. 1). In general, rents rise with city size, but only beyond a threshold in the neighbourhood of 35,000 people: in smaller towns rents seem not to vary systematically with size, suggesting that the built-up areas themselves were small enough practically to annul site rents, and, derivatively, that the average rent essentially reflected construction costs rather than land costs. Table 9, panel A accordingly covers the 40 cities with more than 35,000 people, including the (italicized) 12 not in Giusti's sample.[68] Together, their urban centers contain 3.559 million rooms, excluding offices (col. 2), or some 14.5 percent of the estimated national total (24.542 million rooms, excluding offices); these

[66] Data entry is tedious but instructive. Ferrara, for example, includes zero office space: a signal that the census counted only the office space in inhabited (or inhabitable) dwellings, and not all office space (*Censimento demografico*, vol. 7, p. 209), implying *inter alia* that the reported number of offices cannot be used as an indicator of business activity. Units are here converted to rooms using the frequency distributions, assuming as before (Fenoaltea 2015h, p. 88) an average of 7 rooms for those of 6 and more (the sample data are consistent, save in the case of, again, Ferrara: 3 units, or up to 21 rooms, may have been missed). Empty rooms are not excluded, on the (shadow-price) grounds already noted. The share of empty rooms is typically a single-digit percentage, but with outliers over 20 percent in the city (37 percent in Ragusa), and over 40 in the rest of the municipality (77 percent in Syracuse). These astonishing figures appear to reflect seasonal migration, some of it no doubt long-distance; especially in the South, however, many farm workers wintered in large agglomerations but spent the summers near the fields they worked, sleeping under rudimentary shelter (as noted by the *Censimento 1881 Relazione generale*, pp. XXIV, 94; the 1881 census was taken in winter, the 1911 census in summer). Conversely, as can be seen from Table 9, panels A and B, cols. 1–4, the number of people per room (excluding offices) was typically within a relatively narrow band (say between 1 and 2.5), but with notable exceptions among the cities (7 in Foggia) and especially in the residual municipalities (8 in Naples, 31 in Caserta, 56 in Genoa), variously suggesting permanent poverty, unhoused seasonal farm workers, and *bidonvilles* of immigrants attracted by industrial growth.

[67] The figures in italics, differently derived, are returned to below. Giusti's figures indicate, for Andria (panel A), costs ranging from 50 to 100 lire per room for bourgeois housing, and 65 to 100 lire per room for working-class housing, and again for Perugia (panel B), costs ranging from 33 to 100 lire per room for bourgeois housing, and 50 to 100 lire per room for working-class housing: a curious pattern that points to error, to some form of discrimination, or significantly larger (less private) working-class rooms.

[68] These are, in order, Palermo, Catania, Foggia, Messina, Taranto, Modica, Trapani, Corato, Molfetta, Barletta, Modena, and Piacenza, all but the last two Apulian or Sicilian.

here represent only themselves.[69] Panel B covers the other 38 cities in Giusti's sample. Together, for the reason noted, they are taken to represent all other housing, urban, suburban, and dispersed, that is, the residual (24.542 – 3.559) = 20.983 million rooms.[70] The median pairs of these 38 sample rents average 82.5 lire per bourgeois room, and 49.5 lire per working-class room.

The rent pool in 1911 is accordingly estimated through the following steps. The first order of business is to estimate the 12 missing rent pairs in panel A. The rent pool at 1908 rents per room is then obtained by estimating the split between bourgeois and working-class rooms in each of the 40 major urban centers, and in the large residual. The resulting aggregate rent pool is then converted to 1911 rents using, *faute de mieux*, the usual rent index.

The 12 missing rent pairs in panel A, which involve around 2.6 percent of the rooms at hand, are estimated through a simple regression analysis of the other 28. The dependent variables are the bourgeois-housing rents (col. 7) on the one hand, and the working-class-housing rents (col. 8) on the other. The (common) independent variables are the regressors collected in panel C.[71] The first (col. 1) is of course the urban population (panel A, col. 1), as an indicator of city size. The second (col. 2) is an index of urban growth, calculated as the ratio of the urban center's population in 1911 to that in 1901, as reported in the *Censimento demografico*, vol. 7, p. 56*. Like the figures in col. 1, these refer to the number of persons present, and suffer from the shift in the census date from winter (1901), when seasonal migrants were mostly present, to summer (1911), when they were not. The third regressor (col. 3) is a measure of demographic pressure, the ratio of the persons present to the available rooms (panel A, col. 1/ col. 2); like the previous regressors, it is presumably distorted by the absence of seasonal migrants. The fourth regressor is accordingly the share of empty rooms in 1911 (the ratio of col. 3 to col. 2 in panel A): it should in principle offset the distortions in the preceding regressors, as a high share, for example, would point to larger winter population, a higher growth rate, season on season, and greater demographic pressure. The fifth regressor is a regional index, running from 1 to 16, rising as one moves from North to South; it should pick up the macro-regional rent gradient, if present.[72] The sixth and final regressor is a crude index of the topographic constraints on urban growth, rising from 0 for apparently unconstrained cities ("in a featureless plain") to 10 for cities totally hemmed in (by escarpments or, as in the extreme case of Venice, by

[69] Of these 40, 31 were provincial capitals: all save Taranto (in the province of Lecce), Andria, Corato, Molfetta, and Barletta (Bari), Modica (Syracuse), and San Pier d'Arena, La Spezia, and Savona (Genoa). Of the other 38 provincial capitals, 14 (Pavia, Mantova, Siena, Caltanissetta, Pisa, Treviso, Ravenna, Perugia, Lucca, Reggio Emilia, Pesaro, Cuneo, Arezzo, and Grosseto) appear in panel B.

[70] Panel B includes Lecco, in Giusti's sample but too small to be covered by the census room count. The estimates in cols. 1 and 4 attribute the municipality's nucleated population to the city (*Censimento demografico*, vol. 1, p. 167); urban and exurban rooms (cols. 2–3, 5–6) are estimated from the corresponding populations, borrowing the ratios registered for Como.

[71] Panel C includes all 40 cities in panel A. The 28 non-italicized cities are the sample that generates the regression results. The values of the regressors for the other 12 (italicized) cities are combined with the coefficients of the selected regression equations to generate the rent estimates that appear, for those (italicized) cities, in panel A.

[72] The regional indices are in the order Piedmont (1), Liguria, Lombardy, Venetia, Emilia, Tuscany, Marches, Umbria, Latium, Abruzzi, Campania, Apulia, Basilicata, Calabria, Sicily, Sardinia (16).

water); it was obtained by a simple inspection of the present-day map, and estimating, by eye, the share of the old center's circumference which was subsequently built up.[73]

The regression results are collected in panels D (bourgeois rents) and E (working-class rents). In both panels, the city-size variable (col. 2) displays considerable significance, as expected, and comfortingly stable coefficients across specifications. Again in both panels, the urban-growth variable (col. 3), the demographic-pressure variable (col. 4), and the regional-gradient variable (col. 6) appear thoroughly useless, the first of these surprisingly so. The contribution of the topographic-constraint variable (col. 7) is instead marginal in the case of bourgeois rents, and much more significant in that of working-class rents; this suggests that the upper classes readily found space in the city's core (itself perhaps defined by their presence), and that the limits to urban expansion were suffered by the workers who crowded around them. The share-of-rooms-empty variable (col. 5), which should correct for (working-class) seasonal migration, is instead somewhat surprisingly useless in the working-class-rent equations, and even more surprisingly, *not* useless in the bourgeois-rent equations. This last result is tied to the city of Bari, where no less than 15 percent of the rooms were empty (panel C, col. 4), and bourgeois rents (but not working-class rents) were, for the city's size, remarkably high (panel A, cols. 7 and 8).[74] On the other hand, a number of the rents to be estimated refer to cities much like, and often physically close to, Bari itself, much less an outlier in the company of those 12 than among the 28 in the regression sample. With only limited misgivings, therefore, the missing 12 rent pairs are estimated from the data in panel C using panel D, equation (2) for bourgeois rents, and panel E, equation (4) for working-class rents. The resulting estimates appear, in italics, in panel A, cols. 7 and 8.

As here averaged, the city-specific bourgeois-room rents in Giusti's sample range from under 1.00 to over 2.50 times the corresponding working-class-room rents, with a median ratio in excess of 1.50: the rent pool depends heavily on the housing mix, documented neither by Giusti nor by the census housing data. Here, the mix is estimated from the data on domestic servants in the *Censimento demografico*, vol. 4. It is initially assumed that modest 6-room bourgeois units averaged 1.25 servants, and elegant ones twice as many; further assuming as before that there were two modest units for each elegant one, the average number of bourgeois rooms per servant works out to 18/5 = 3.6. The data and estimates for the 40 largest urban centers are collected in Table 9, panel F. Col. 1 transcribes the reported number of domestics in the entire municipality; the figures for the city proper are not available. Col. 2 transcribes the estimated number of bourgeois rooms in the major urban center. It is the simple average of two alternative estimates. The first is simply the number of domestics in the municipality (col. 1), times 3.6; it implicitly assumes that the municipality's upper classes were concentrated entirely in the major city. The second is that first estimate, multiplied by the major city's share of the municipality's population (panel A, col. 1/(col. 1 + col. 2)); it assumes an equal proportion of domestics, and upper-class individuals, in the major city and the rest of the municipality. Col. 3 transcribes the estimated number of working-class rooms in the major urban center; it is obtained by deducting the estimated number of bourgeois rooms (col. 2) from the total number of rooms in the urban center (panel A, col. 2). Cols. 4 and 5 are the major-city bourgeois and

[73] The estimate for Bergamo is particularly weak, as it is not clear whether the indicated rents refer to the hemmed-in *città alta* or the essentially unconstrained city in the plain.

[74] If Bari is removed from the sample the share-empty coefficient in panel D, equation (2) becomes negative, with a t near –.4.

working-class rent pools, obtained as the product of room numbers (cols. 2 and 3) and the corresponding rents per room (panel A, cols. 7 and 8); their sums are transcribed in col. 6.[75]

Together, these 40 urban centers are attributed 668,463 bourgeois rooms and 2,890,558 working-class rooms; the corresponding rent pools sum to 113.846 and 332.918 million lire, yielding averages of 170 and 115 lire per room, respectively, and 446.764 million lire in all. The total number of domestic servants was reported at 483,209, yielding 1,739,552 bourgeois rooms in all, for a residual 1,071,089 bourgeois rooms elsewhere. Given the estimated total number of rooms (24,542,000, excluding offices), the number of working-class rooms elsewhere works out to 19,911,890 (24,542,000 total rooms, less 1,739,552 total bourgeois rooms, less 2,890,558 working-class rooms in the 40 major urban centers); applying the median rents estimated above (respectively 82.5 lire per bourgeois room, and 49.5 lire per working-class room), the residual rent pools work out to 88.365 and 985.639 million lire, respectively, and 1,074.003 million lire for the two together. Adding this last to the above figure for the 40 major cities, the total rent pool in 1911 is estimated equal to 1,520.8 million lire at 1908 rental rates. Dividing that figure by .898 (the value of the usual rent index in 1908, with 1911 = 1), one obtains an estimate of the rent pool in 1911 of 1,694 million lire.

This result is as noted sensitive to the weighting of bourgeois and working-class rooms, and therefore, given the present algorithm, to the estimated number of bourgeois rooms per servant. If modest 6-room bourgeois units are attributed the minimal 1.00 servant each rather than 1.25, and elegant units 2.00 servants rather than 2.50, assuming as before that there were two modest units for each elegant one the average number of bourgeois rooms per servant works out to 18/4 = 4.5 rather than 3.6; working through the calculations as above, the estimated total rent pool in 1911 rises to 1,712 million lire. Allowing instead a probably excessive 1.50 servants per modest unit and 3.00 per elegant one, bourgeois rooms per servant fall to 3.0, and the estimated total rent pool in 1911 falls to 1,681 million lire. The estimates are not unduly sensitive to the assumed number of servants per bourgeois dwelling, and the entire range from 1,681 to 1,712 million lire is contained in the 1,637 to 1,716 million lire calculated from the buildings-tax data.

The value added estimate selected here is the central room-based rent-pool estimate of 1,694 million lire. From the rent pool Zamagni deducted 98 million lire for maintenance (the present author's 103 million lire for private buildings, less 5 percent for non-residential structures), and a further 23 million for administrative costs (Rey 1992, p. 237). This last, small deduction is here rejected, as the corresponding income is not clearly counted elsewhere (and the rent pool is in any case largely imputed); and so is the maintenance deduction, as maintenance is here considered an investment rather than an operating cost (Fenoaltea 2020a, Appendix A).[76]

[75] The bourgeois rent pool is typically 15 to 35 percent of the total. The upside outlier is Como, virtually an upper-class enclave; the downside outliers reasonably include such towns as Andria, Barletta, Corato, and Molfetta, all near Bari, and S. Pier d'Arena near Genoa. The use of equation (2) in panel D does not appear to have generated obvious distortions.

[76] The revised estimate of residential structures' value added in 1911 (1,694 million lire) is some 34 percent above the Zamagni/sesquicentennial benchmark of 1,267 million lire, and 59 percent above Istat's centennial estimate of 1,067 million lire. With respect to Fenoaltea (2017a) the benchmark is revised (again to correct the improper treatment of maintenance); the extrapolating algorithm (§4.6.4) is unchanged.

4.6.4 Buildings (1861−1913)

The 2005 building-services series extrapolated the 1911 benchmark in direct proportion to the stock-maintained series, already derived to serve as an index of the maintenance activity counted as part of the construction industry. That stock-maintained series assumed negligible maintenance on very new buildings, and corresponds essentially to the extant stock, lagged a few years; that lag is here removed, and the (un)shifted series better tracks the stock actually in service. Here, the starting point is the 1911-price series for (construction value added) in the maintenance of private structures (Fenoaltea 2105h, Table K.58, col. 8; Fenoaltea 1987, Table 4, col. 4), itself a constant (.012) times (the construction value added embodied in) the stock to be maintained. The first step is to extend that series, with the data and algorithms provided, to 1917; the added estimates for 1914-1917 equal 66.9, 68.8, 70.8, and 72.7 million lire, respectively. The second step removes the estimated losses from the earthquake at the end of 1908; this is done by adding .7 million lire (.012 times the estimated stock lost, 52.7 million lire of taxable structures and 6.5 million lire of exempt structures) to the figures for 1909–1917. The third step shifts the series 3.5 years backwards, so that the revised estimate for 1911 is obtained from the original ones for 1914 (which reflects new construction through 1910) and 1915 (which includes new construction in 1911).[77] The fourth step deducts .7 million lire from the shifted estimates for 1909–1913, thus reintroducing the earthquake losses. The fifth step converts the resulting series into an index, with 1911 = 1; thanks to these modifications, the peaks in the stock's growth rate now coincide with the peaks in new construction. From 1861 to 1911, it may be noted, the stock increased by some 63 percent.

The final and at least conceptually more significant improvement to the series involves its disaggregation. The 1987/2005 stock series was constructed to track construction-industry value added in maintenance, which can be presumed roughly constant, in real terms, per standard unit, regardless of its location: a room is a room is a room. For present purposes, however, location matters, as the services of a room in the heart of a major city are worth far more than those of an otherwise identical room in the suburbs or in a smaller agglomeration.

The disaggregation and weighted reaggregation of the shifted room-stock series is based in turn on Istat (1977), Table 1, which reports, for every census date, the resident population of each municipality (*comune*) that was a provincial capital in 1971, at 1971 borders, and the residual population, by province and region.[78] All the municipalities and provinces in that table that were part of the Kingdom in 1911 enter the present sample. No data are provided for 1861 for the municipalities and provinces that were annexed between 1861 and 1871; those municipalities' population, and their provinces' residual population, in 1861 are here estimated assuming a constant growth rate from 1861 through 1871 to 1881.[79] An exception is made for the city of Rome, annexed in 1870, and thence the national capital; its population in 1861 is directly estimated as 90 percent of that a decade later.

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[77] To be entirely logical, the estimated demolitions should be separately shifted; but these are a small constant times a slowly growing stock, and the error introduced by the present short-cut can be presumed immaterial.

[78] Istat (1977), Table 1, includes the corresponding figures for the population present at the census date. These are not used here, as housing demand seems more closely tied to residence than to presence. The sample includes the 69 provincial capitals of 1911, and 21 others that obtained that status in later years.

[79] The 1861 data include obviously partial data for the population outside the provincial capital in the province of Mantua, and in the provinces of Latium (other than Rieti, then part of Umbria). These are ignored, and estimated as if they were missing altogether.

The outcome of the present algorithms is collected in Table 9, panel G. Rows 1–11, cols. 1–5 group the population of the sample municipalities at each census date, by size class: the upward drift over time, which justifies the present exercise, is obvious. It must also be noted that the sample in question is exhaustive in the upper reaches, but not in the lower ones: many small towns which never became provincial capitals were surely larger than many that were, or became so in later years.[80] Row 13 refers in turn to the total population. From 1871 to 1911 the transcribed total is the simple sum of the totals reported in Istat (1977), Table 1 for the regions present over those years, with the figures for Venetia augmented by the provincial totals for Pordenone and Udine (later transferred to Friuli-Venezia Giulia).[81] In 1861, the regional figures are amended, before being summed, to allow for missing or partial data.[82] Row 12 is the residual, obtained as the total in row 13 minus the sum of the figures in rows 1–11.

Col. 6 estimates the share of the municipalities' population that was actually in their major cities in 1911. For simplicity, it is calculated using the major cities' present-population figures in panels A and B, col. 1, and dividing the appropriate sum by the corresponding figure in panel G, col. 5.[83] These ratios vary widely from city to city, depending on the extent to which the countryside was inhabited (which in places it tended not to be, for example in Latium, and Apulia), and of course on the variations in municipal boundaries from 1911 to 1971 (whence for example a ratio of just .37 for Genoa, which absorbed San Pier d'Arena and more in 1926). In general, however, and as one would expect, col. 6 reveals a tendency for the ratio to rise across size classes.

Panel H is accordingly a *reprise* of panel G, with the figures scaled to more nearly reflect the actual capital-city population of the major municipalities. The scale factor, transcribed in panel G, col. 7, is a monotonic one, loosely derived from col. 6 (and corresponding in principle to its systematic element); for further simplicity, it is applied equally to all the census years. The figures in panel H, rows 1–11, cols. 1–5 are the corresponding figures in panel G, thus scaled. Row 12 is obtained, as before, as the total in row 13 minus the sum of the figures in rows 1–11; one notes that the share of that residual (small-town and dispersed) population declined monotonically from 91 percent in 1861 to 86 percent in 1911.

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[80] The extreme case is the smallest municipality in the sample, what is now Latina: in the period at hand a village of a few hundred in the Pontine marshes, a town only after the latter were drained, between the Wars.

[81] Because the northeastern border changed over time, so did the borders of the corresponding municipalities; the present corrections are approximate, and the totals in line 13 differ from the actual census figures, but by less than 1 percent.

[82] The total for Lombardy is amended to replace the partial figure for the province of Mantua by the estimated figures for that town and the rest of that province. The total for Venetia (plus Pordenone and Udine) is obtained as the sum of the estimates for the major town, and the residual, of each province. The total for Latium is replaced by the sum of the data for the capital city and residual province of Rieti, and the corresponding estimates for the capital cities and residuals of the other provinces.

[83] The largest class, for example, consists in 1911 of Naples and Milan, with a combined major-city population of 1.201 million, against a (1971-border) municipal population of 1.453 million, for a ratio of .83. The urban population of towns that do not appear in panels A and B (e.g., Reggio Calabria and Pistoia in line 10) are taken directly from the *Censimento demografico*, vol. 7.

Panel H, col. 6 transcribes the estimated cross-section rent index, at 1911 prices.[84] It ignores differences in crowding, differential constraints on urban growth, and more, and looks only to city size. Repeating the regressions in panels D and E with population-present (panel C, col. 1) as the sole regressor, one obtains constants equal to 92.6 and 58.7, and slope coefficients of .233 and .196, for bourgeois and working-class rents, respectively. Averaging these in proportion to the 668,463 bourgeois rooms and 2,890,558 working-class rooms obtained in panel F, the average rent works out to 65.07 + .203 times urban population. The estimates in col. 6, rows 1–11 are obtained from this formula, with the urban population calculated as the mid-point of the municipal population range times the urban scale factor in panel G, col. 7.[85] The corresponding estimate in row 12 is instead obtained directly as the weighted average of the above estimates for the residual (1,071,089 bourgeois rooms at 82.5 lire each, and 19,911,890 working-class rooms at 49.5 lire each).[86]

Panel H, row 14 transcribes the estimated values of the constant-price diachronic rent index that captures the effect of the redistribution of the population. It is obtained by weighting rows 1–12 of cols. 1–5 by the cross-section rent index in col. 6, summing the resulting figures and dividing the resulting sums by the totals in row 13, and finally rescaling the resulting ratios so that 1911 = 1. From 1861 to 1911, it would appear, the redistribution of the population raised the constant-price value of the stock of buildings by some 11 percent, augmenting the estimated 63-percent increase in the stock itself.

The revised estimate of the 1911-price value added by residential buildings appears in Table 1, col. 23. It is obtained as the product of the rent index in panel H, row 14, geometrically interpolated between the estimated benchmarks and extrapolated to 1913, the new stock index described above, and of course the 1,694 million lire estimate derived for 1911 itself.

4.7 Government services

4.7.1 Introduction

The two extant series for the government-services sector, and the new one (Table 1, col. 24), are illustrated in Figure 1, panel C6.[87] The 2005 series extrapolated the 1911 "benchmark" figure in Rey (2000) using an annual index that geometrically interpolated and extrapolated four census-year data points: the labor-force estimates for 1881, 1901, and 1911 provided by Vitali (1970), and a comparable figure constructed for 1871. As was noted at the time the preceding centennial series (Fuà 1969) incongruously dropped by a quarter from 1861 to 1880 before climbing back to a reasonable end-point, suggesting deflation by a price index that grew much too rapidly over the first half of the period at hand, and not rapidly enough over the second (Fenoaltea 2005, pp. 292–296); the simple monotonic growth of the 2005 series seemed far more nearly right.

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[84] The rents in col. 6 are actually derived from Giusti, and therefore 1908 rents; but only their relatives matter here, so a scalar inflation to 1911 levels is pointless.

[85] The largest is open-ended; its mid-point is set at 725 thousand, returning the actual 600-thousand average for the cities of Naples and Milan.

[86] This average is less than the constant of the equation that generates the estimates in rows 1–11; it may be noted that that constant folds in the effect of topographical constraints, and that the sample of Italy's larger cities includes a disproportionate number of coastal ones.

[87] The new series is the only services-sector series unchanged from Fenoaltea (2017a).

The derivation of the sesquicentennial series is in its own context something of an exception. In the first place, the current-price series was reconstructed directly from budget expenditure data (Battilani, Felice, and Zamagni, 2014, pp. 51–55): it did not combine a quantity series and a price series, and thus left Baffigi with no "real" indicator at all. Baffigi, looking elsewhere, turned to the public-sector employment estimates of Broadberry, Giordano, and Zollino (Baffigi 2015, p. 110); these are a constant (.8686) share of their corresponding labor-force figures, themselves no more than linear interpolations of the usual few census data points, somewhat modified, as explained below, with respect to Vitali's (Broadberry, Giordano, and Zollino 2011, pp. 43–46, Tables A3–A4). In the second place, again exceptionally, Battilani, Felice, and Zamagni did not tie their current-price series to the earlier "benchmark" figures (in Rey 2000); but (once again) Baffigi did. For present purposes the upshot is that the 2005 and the sesquicentennial 1911-price series share the earlier 1911 benchmark, and extrapolate it with similar data and methods: as Figure 1 confirms they are horses of much the same color.[88]

Neither is a candidate for stud: neither series contains more than a handful of observations, and neither even gets them right. The problem here stems from the census count of serving draftees, who may have reported their normal occupation rather than their current one. The 2005 series simply borrowed (and extrapolated) Vitali's corrected labor-force figures (Vitali 1970, pp. 330–331). That these were *not* corrected for this particular misreporting (ibid., pp. 262–271) was simply overlooked; if one corrects them using Vitali's data for the military (ibid., p. 265), as documented below, the intercensal growth rates from 1881 to 1901, and again from 1901 to 1911, practically double. But these significant changes in the growth rate of the aggregate are tied to equally significant changes in its composition, in the share of draftees, by monetary value the lowest class of public employees; for present purposes the resulting increases must correspondingly be tempered.

Broadberry, Giordano, and Zollino (2011, p. 44) noted the problem the present author overlooked, and cited Vitali in support; but they apparently got the solution backwards, and excluded recruits from the military to redistribute them to their permanent occupation rather than the other way round.[89] As Figure 1, panel C6 again confirms they modified the 2005 series in the wrong direction, decreasing its intercensal growth rate where they should have increased it (and vice-versa). The sesquicentennial series incorporates their error, and is accordingly (once again) even poorer than its immediate predecessor.

The new series accordingly aims to introduce multiple improvements. The census-year benchmarks are recalculated, to allow both for omitted draftees and at least for the more conspicuous changes in the composition of the relevant labor force; and the revised benchmarks are interpolated and extrapolated using deflated current-price series that incorporate evidence of short-term fluctuations. The new series reduces measured growth over the early decades, and increases it over the later ones; and it picks up war-related and Kuznets-cycle deviations from trend the earlier series altogether missed. But the method is heuristic, the results tentative – as in the case of agriculture, and

[88] Baffigi's series at *current* borders is log-linear from 1861 to 1881, and his constant-border series' breaks in 1866–67 and 1870–71 appear to be spurious.

[89] They claim to be following Vitali, but Vitali's interest was in the professional distribution of the labor force, corrected for the distortion introduced, for his purposes, by compulsory military service; Broadberry, Giordano, and Zollino were working toward productivity measures, and in that context it makes no sense at all to replace the number actually working by the number that would have been working absent military service (not that this matters much, next to the much deeper deficiencies of their reconstruction, Fenoaltea 2017b, footnote 60 and references therein).

for exactly the same reasons: the available aggregate series (here at current prices) is of unknown content, but a recalculation *ab initio* is too ambitious a project to be taken on here.

4.7.2 Time-series evidence

Evidence of short-term movements (of prices and quantities together) is contained in the current-price series. Baffigi's work sheets contain an initial current-price series (which he then forces through the old benchmarks) attributed to Battilani, Felice, and Zamagni (2014).[90] This series, adjusted to eliminate border changes, is transcribed in Table 10, panel A, col. 1; one notes that the estimate for 1911 is 1,239 million lire, close but not identical to the 1,247 million (from Rey 2000) of the sesquicentennial series.[91] As can be seen from the corresponding graph in panel B, part (a), this is a user-friendly series: a bit messy in the 1860s, what with Unification in 1861 and war in 1866, but otherwise a classic Kuznets-cycle path, exactly as one would expect (Fenoaltea 2011a, ch. 2, 2017b).

The rub is its deflation. In essence, the aggregate would appear to combine three main components: the salaries of career public servants (affected less by market forces than by the ruling classes' capacity to extract the rents it retained or distributed as patronage); the (presumably near-market) wages and salaries paid other civilian public employees; and the value of the income, largely in kind, provided to the lower ranks of the military.

A salary index for the first group is readily compiled. The *Sommario*, pp. 204–205, reports the annual salaries of 11 grades of State employees, ranging down from director general to doorman and gofer: 5 grades refer to the "directors' career," 3 to the "executives's career," and 3 to the "auxiliaries' career."[92] These move broadly together (and in steps), so the specific weighting scheme should not unduly influence the results; here, they are given what are considered not unreasonable weights (respectively, from first to last, 1, 4, 15, 30, 30, and 10 each for the other 6). The sum of the weighted series is the current-price salary pool of a 140-man cohort of the indicated composition; to smooth out its steps a three-year moving average is taken (leaving the end-points unchanged), and the smoothed series is rescaled to set 1911 = 1. The resulting index of career-State-civil-service salaries is transcribed in Table 10, panel A, col. 2.

For other civilian employees there is no comparable record. The urban/industrial wage index in Fenoaltea (2011a), p. 125 is a starting point, but no more than that, as it refers specifically to unskilled labor, and a large share of the workers in question were no doubt in clerical positions. Over

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[90] There is a reason for this guarded language. The "Battilani, Felice, and Zamagni" series in Baffigi's work sheets closely tracks the figures for 1861–1906 in Battilani, Felice, and Zamagni (2014), p. 69, but not the corresponding figures for 1907–13 on p. 70. These last appear internally inconsistent (as the whole is not the sum of the parts), and, component by component, inconsistent with those on the preceding page. Moreover, the relevant graph (p. 57) illustrates a series that is consistent with Baffigi's aggregate (here in Table 10, panel A), and not with the published figures on p. 70. There are therefore good reasons to dismiss the published figures on p. 70 as errors that escaped the authors' proofreading, and to accept Baffigi's version of their series as the correct one.

[91] The series in Baffigi's work sheets is at current borders. To approximate a constant 1871–1913-border series, his figure for 1871 is here brought back to 1861 in proportion to the borders-of-today series in Battilani, Felice, and Zamagni (2014), p. 69.

[92] These were not a single career in three parts but separate, parallel careers: each had an entry-point rank for young people, who could seek a career commensurate with their educational (and social) qualifications. "Executive" retained its etymological connotation of subordination: directors direct, executives execute.

the long term, the skill premium (for literacy and more) presumably declined; over the medium term, the earnings of the skilled reflected prosperity and depression like those of the unskilled, but only the latter were directly sensitive to the long swing in the openness of the economy and the attendant swing in the equilibrium land/labor and wage/rental ratios. Here, the unskilled-wage index is rescaled to set 1911 = 1. An alternative index is derived from the latter, assuming it varied, in relative terms, half as much, year on year; it accordingly grows less from end to end, and deviates less from its trend. These two indices are then simply averaged together; the result is transcribed in Table 10, panel A, col. 3.

Of the military, the officer class boasted better social origins even than the upper civil service, and was if anything even better treated (e.g., *Annuario 1884*, pp. 371, 408); there is no reason to believe their relative status changed, and for time-series purposes the career-civil-service index calculated above can serve for the officer class as well. The rank-and-file were instead fed, clothed, and housed, and received a small daily allowance. For the income in kind, the working-class cost-of-living index in Fenoaltea (2011a), p. 128 is borrowed here, rescaled to set 1911 = 1. The monetary allowance is here assumed to have tracked, more or less, the wages of the unskilled; as about half the recruits were farm boys (*Annuario 1911*, p. 327), the indices of unskilled-workers' wages in agriculture and industry in Fenoaltea (2011a), p. 125 are here simply rescaled to set 1911 = 1 and averaged together. Further assuming, simply but as will be seen below not unreasonably, that in 1911 the monetary and in-kind payments were of a similar magnitude, the cost-of-living and the synthetic wage index are also simply averaged together. The resulting series is transcribed in Table 10, panel A, col. 4.

Table 10, panel B, part (b) illustrates these three remuneration indices. The soldiers' remuneration index contains the cost-of-living index, dominated by world commodity prices (and barriers to trade); it goes its own way. The market wage and public-salary indices display very different trends, but a somewhat similar long cycle, presumably because the long swing in capital flows and therefore the constraints on public spending largely paralleled that in the openness of the economy and therefore the demand for labor (Fenoaltea 2012, Figure 2). Part (c) illustrates the series that emerges if the entire current-price series is deflated by each of these three price indices in succession. The index for career civil servants, derived from Istat's *Sommario*, returns a deflated series much like Istat's own (Fenoaltea 2012, Figure 3), suggesting that that is how that particular camel got its incongruous hump.[93] Clearly, the salary data are relevant to the upper strata of public employment, but only to those.

Value added in government services conventionally includes labor costs and the (largely imputed) rental value of buildings.[94] The readily available index in Fenoaltea 2015h, Table K.53, col. 26 is here again pressed into service. That index begins in 1872; it is here extrapolated back to 1861 assuming an annual increase of 2 percent in 1871 and '72, as in the immediately following years

[93] And incongruous it is, as this is not a scenario like the A.M.A. restricting entry to drive up the incomes of those remaining: when the budget allowed the upper classes extracted additional rents by increasing both public-service salaries and public-service employment, and a sustained opposite movement of the two makes no sense at all. When the budget allowed, and perhaps when it did not: what is striking is the rise in remuneration even in the early 1870s, when the Right was struggling to balance the budget and "cutting expenditure to the bone."

[94] Logically, of course, it should include the rental value of all public assets, from roads to stocks of weapons; but these are here set aside. Recommended wear for national income accounting excludes a thinking cap.

(all years of significant inflation), and 1 percent before that. For convenience this index is also transcribed in Table 10, panel A (col. 5).

4.7.3 Census-year benchmarks

The censuses of course provide evidence directly in real terms, unaffected by price changes, and typically in enough detail to document the sector's changing composition; allowing also for price movements, the aggregate current-price series can in principle be reverse-engineered.

The construction of the census-year benchmarks is documented in Table 10, panel C. Part A (rows 1–5) disaggregates the labor force (initially for 1871 and later, as the 1861 census data require a different exercise). Rows 1–3 count the civilian labor force, distinguishing career civil servants (who include the handsomely rewarded upper reaches of State administration), schoolteachers not in private institutions, and other public personnel. Both the latter groups presumably earned near-market incomes; the former were very largely female, the latter male.[95] Row 1 sums over categories 10.11, 10.17, and 10.83 in 1911, XXIII.1 and XXIX.3 in 1901, IX.1 and IX.4 in 1881, and VIII.1 and VIII.6 in 1871. Row 2 is taken from category 10.61 in 1911 and XXVI.1 in 1901, and the sum of categories XIII.1 and XIII.2 in 1881, and XII.1 and XII.2 in 1871; following Vitali (1970), the census figures are reduced by a uniform 15 percent to allow for instructors at private institutions. Row 3 sums over categories 7.45 and 10.12–10.16 in 1911, XXIII.2–XXIII.6 in 1901, IX.2–IX.3 and IX.5–IX.16 in 1881, and VIII.2–VIII.5 and VIII.7–VII.16 in 1871. For simplicity the present figures ignore Vitali's minor further adjustments to allow, for example, for military doctors and veterinarians.

Rows 4 and 5 count the military labor force, again distinguishing officers (who include the handsomely rewarded flag ranks) from other ranks (dominated by simple draftees). The figures for 1911, 1901, and 1881 are those to be found in Vitali (1970), p. 265. The figures for 1871 are from the *Annuario 1886*, pp. 978, 980, which report 12,551 serving army officers and 169,980 others on active army duty in 1871, and 1,173 serving navy officers; annual figures for other naval ranks begin only in 1872, but these point to a total of some 9,400 in 1871.

The 1861 census is a much poorer source.[96] For present purposes the only useful data appear to be the aggregate count of 130,597 individuals in "public administration," and 240,044, subject to

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[95] The United Nations' *ISIC* counts public and private education together (category 931, part of 93, social and related community services), separate from public administration and defense (category 91). The inclusion of public education in government services is a peculiarity of the Italian reconstructions: mandated by Istat (1959), it was followed by Vitali (1970), the "benchmark" project (Rey 1992, 2000), and subsequent work. It is maintained here, despite its patent absurdity: if for the purposes of classifying economic activity who pays trumps what the payee is paid for, a thoroughgoing Soviet economy would have no agriculture, no industry, and no services other than government services.

[96] It appears that the three basic volumes of the *Censimento 1861* ignore the issue, and that the distribution of the labor force is considered only in *Censimento 1861 Parte I*, pp. 78–106, thematically more often than systematically. An initial table (p. 79) distinguishes 3 branches of agriculture (vegetable, animal, and "related"), mining, manufacturing, commerce, the professions, clergy, public administration, internal and external security, property-owners, servants, the poor, and those without a profession. Subsequent tables distinguish, within mining, extraction and processing (p. 90); within manufacturing, 9 professions (p. 94; these occupation-specific figures sum to under half the manufacturing total); within commerce, wholesale trade, retail trade, and transportation (p. 97); within the professions, only the medical ones (p. 98; these figures sum to 8 percent of the professional total); and within the clergy, the regular and the secular (p. 101). Broadberry, Giordano, and Zollino detail the reallocation from the 1861 census categories to their own (Broadberry, Giordano, and Zollino 2011, p. 49); the difficulty is that their numerical "census" categories are of their own

the usual misreporting, in "internal and external security." The figures for 1861 in part A are tentatively obtained as follows. In rows 1–3, col. 5, the present estimates simply assume the same growth rate over the first decade as over the second. Their sum is 6.7 percent over the census figure: close enough to a reasonable allowance for the change in geographic coverage that further modification seems pointless. The military are more than usually difficult to gauge. The earliest data, again in the *Annuario 1886*, pp. 978, 980, list 13,938 officers and 227,170 men serving in the army in 1865 (and far more in the war-year 1866); for the navy, 762 officers are listed for 1862 (against 850 plus in the next few years), and 8,773 men are listed for 1872 (when the number of officers had risen to 1,173). Here, the estimated number of officers in 1861 is simply the sum of those somewhat later figures; the estimated number of men, the reported army figure for 1865, augmented by 5,764 in the navy in 1862, as suggested by the figures for naval officers. The resulting total is accepted here, and duly appears in row 5. It is some 3 percent below the census figure. The latter should no doubt be increased by a double-digit percentage to allow both for its limited geographic coverage and for the underreporting of draftees, and at the same time reduced, one suspects by a similar magnitude, to exclude the here irrelevant "internal security" component; any further tweaking of the figure obtained here is as likely to increase its error as to reduce it.

Part B presents the relevant totals, from the earlier literature (rows 6–8) and from the new estimates in part A (rows 9–10). Row 6 reports the national figures for 1911, 1901, and 1881 in Vitali (1970), used directly by the 2005 series, and the extrapolated figures for 1871 and 1861 of that self-same series. Row 7 reports Vitali's totals, corrected using his own data for the serving military.[97] Row 8 transcribes the "full-time-equivalent" figures, that omit most of the military (and a fixed share of the residual labor force), in Broadberry, Giordano, and Zollino (2011), Table A4. Row 9 is the simple sum of rows 1–5.

Row 10 sums over rows 1–5, weighted by plausible relative unit incomes (salaries, wages, and income in kind for the serving other ranks) and rental costs in 1911; the estimates are derived as follows. In 1911, the total compensation of the 140-man cohort of career civil servants described above yields an average of 3,700 lire per person; it is here applied to those public servants (row 1) and, by extension, to military officers (row 4).[98] Other civilian workers other than schoolteachers (row 3) were mostly male; assuming a preponderance of white-collar workers, they are here allowed 60 percent of that, or 2,200 lire per person. Schoolteachers were entirely white-collar, but 65 percent were female; a somewhat lower average, here set at 2,000 lire, seems not inappropriate. The average value of the food, clothing, and shelter, and monetary allowances for the military "other ranks" is even more difficult to pin down. Perhaps the most useful starting point is Zamagni's estimate of 277 lire as the annual cost of food, at 1911 prices, for an adult male (Rey 1992, p. 230). This figure may bear reduction, given the bulk purchasing of the military, but must be increased, perhaps to 500 lire, to include clothing and shelter; and the monetary remuneration was probably not far from that much again (in the early 1880s it was near 1.0 lire per day for enlisted men, and more for non-coms,

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making, and inadequately explained. Many are relatively obvious, but others are mystifying (e.g., their fifth through ninth category within the professions, where the census has four and at most one other, residual one).

[97] The corrections subtract from the totals in row 6 the military component as reported by the census (160, 204, and 253 thousand in 1881, 1901, and 1911, respectively), and add back in the actual numbers in the Army and Navy (183, 286, and 427 thousand, respectively).

[98] The appropriate adjustment is unknown; it would require documentation of the actual numbers at the different pay scales.

Annuario 1884, p. 376). An overall round figure of 1,000 lire is adopted here, for simple soldiers; adding 10 percent to allow for non-coms, average compensations is here set at 1,100 lire.

The corresponding rent for the offices (or other working space) of these public employees is at best an educated guess. Here, career civil servants and military officers are allowed 189 lire each (an average of one room each, valued at the 170 lire obtained above for the 40 major urban centers in 1908, converted to 1911 prices using the usual rent index). Schoolteachers are allowed (class)rooms averaging 30 percent more, or 246 lire each. Other civilian workers, allowing for those who shared an office and those who lacked one altogether, are allowed one third of the figure attributed career civil servants, or 63 lire each; and nothing is allowed to the troops.

The weighted sums in row 10 are accordingly obtained as (3.7 + .189) times rows 1 and 4, plus (2.0 + .246) times row 2, plus (2.2 + .063) times row 3, plus 1.1 times row 5. In 1911, the compensation component totals 1,193 million lire, the rent component 45 million lire; the latter practically matches the earlier estimate of 44 million lire which Zamagni derived from budget data (Rey 1992, p. 232), while the sum of the two practically matches the current-price value added figure of 1,239 million lire in panel A, col. 1. This result reflects what may be called iterative serendipity: the central point is simply that the present disaggregation, at 1911 prices, sits well with the current-price time-series figure for that year.

Part C (rows 11–15) presents the intercensal average annual growth rates implied, *seriatim*, by rows 6–10. Row 11 refers to Vitali, as published and extended by the 2005 series. The growth rate from 1861 to 1871 is by assumption equal to that from 1871 to 1881; as can be seen in Figure 1, it is marked by a strong deceleration after 1881, and a partial recovery after 1901. Row 12 refers to Vitali, as corrected for the misreporting of recruits; the correction sharply increases the growth rate in both 1881–1901 and 1901–1911. Row 13 refer to the Broadberry-Giordano-Zollino figures used by the sesquicentennial series; as can again be seen in Figure 1, the growth rates vary even more than in the 2005 series. Broadberry, Giordano, and Zollino calculated an 1861 benchmark from that year's census (above, footnote 96); by happenstance or by design, their figures too generate a growth rate from 1861 to 1871 equal to that from 1871 to 1881. Row 14 refers to the new unweighted totals; these point to a monotonic increase in the growth rate from intercensal period to intercensal period. Row 15 refers to the new weighted total, and documents the usefulness of disaggregation: it recovers the deceleration in 1881 and acceleration in 1901 of the 2005 series (row 11), and a previously unsuspected acceleration in 1871 is now also apparent. Compared to the 2005 estimates, the new ones mildly reduce long-term growth; measured growth is sharply reduced over the 1860s, mildly reduced over the 1870s, mildly increased over the 1880s and '90s, and significantly increased after 1901 (from rows 11 and 15).[99]

The weighted physical totals in row 10 (virtually) reproduce the current-price value added estimate in 1911; the figures for the other years are therefore the corresponding estimates of value added at 1911 prices. The time series obtained by interpolating and extrapolating the census-year benchmarks in row 10 – a series analogous to those in the preceding literature – is also illustrated in panel B, part (c).

Panel C, part D (rows 16–20) presents the components of row 10 at each benchmark year, calculated as described above. The changes in the aggregate's composition, over time, are significant, and warrant the present exercise.

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[99] From 1861 to 1911 the 2005 series produced an increase of 95 percent (row 6). The Broadberry, Giordano, and Zollino (and sesquicentennial) series upped that to 126 percent (row 8); the new benchmarks yield 79 percent.

Part E (rows 21–25) presents in turn the current-price components implied by the above disaggregation and the price indices in panel A. Category-specific indices of value added per person, at current prices, are computed as weighted sums of the remuneration indices and the rent index in panel A, cols. 2–5, using the weights implied by the above estimates. For career civil servants, and officers, the index is accordingly calculated as .95 (col. 2) + .05(col. 5); for teachers, as .89(col. 3) + .11(col. 5); for other civil servants, as .97(col. 3)+.03(col. 5); for other military, as 1.0(col. 4). Category-specific estimates of value added per unit are then obtained as the product of the resulting indices, all equal to 1 in 1911, and the value per unit in 1911 estimated above (3,889 lire for career civil servants and officers, 2,246 lire for teachers, 2,263 lire for other civil servants, and 1,100 lire for other military). The resulting figures at the census benchmarks are then multiplied by the corresponding numbers in panel C, part A, and transcribed in the appropriate rows of part E.

Part E, row 26, transcribes the sums of these disaggregated estimates. In 1911 the figures in part E simply repeat those in part D, and as already noted they sit well with the current-price time series in panel A, col. 1. Not so the earlier benchmarks: as panel B, part (c) had warned us to expect, those further census-derived current-price benchmarks lie above the current-price time series, by varying but always impressive margins (panel C, part E, row 27). Nor can these alternative estimates easily be reconciled: the budget-based current-price value added series here borrowed from the sesquicentennial corpus cannot be verified, replicated, or improved, and the census-based benchmarks do not seem amenable to radical revision, as no reasonable tinkering with the present weights and indices could much affect them.

4.7.4 Government services (1861−1913)

In the circumstances, it seems prudent to anchor the desired constant-price series to the 1911-price benchmark estimates, which are derived from the census data with limited manipulation, and to use the expenditure series, and the deflators, as heuristic guides to their interpolation and extrapolation.

The procedure adopted here first generates an initial deflated series, then forces it through the census benchmarks, and finally revises it, *ad hoc*, to eliminate patent incongruities. The initial series is generated as follows. First, the current-price figures for the 1860s are adjusted. The 1861 figure is suspect, as Unification occurred in that very year, and the State budget need not have covered the entire territory over the entire year; the present adjustment is to replace the figure in Table 10, panel A, col. 1 by the arithmetic average of that figure and the one for the following year. For practical purposes, too, the 1866 war-spike is (temporarily) removed from the current-price series; here, the figure in Table 10, panel A, col. 1 for 1866 is replaced by a simple average of those for 1865 and 1867, for a net reduction of 202 million lire.[100] Second, the category-specific benchmark figures in panel C, part E, rows 21–25 are converted into shares of the totals in row 26; the procedure of course assumes that these estimates' relative magnitudes, if not their absolute values, are at least approximately correct. Third, these benchmark shares are linearly interpolated (and extrapolated to 1913). Fourth, year after year, each category-specific share series is multiplied by the corresponding category-specific index of value added per unit described above, and the results are summed into a synthetic deflator. Fifth, the resulting index is used to deflate the ex-war current-price series. The initial deflated series so obtained is illustrated in Table 10, panel B, part (d).

The initial deflated series is then forced through the 1911-price census-year benchmarks, in the usual way. The resulting series is also illustrated in Table 10, panel B, part (d). From 1861 to

[100] The later, African wars were colonial expeditions; these presumably did not involve mobilization, and do not warrant similar adjustments.

1881 the results seem reasonable enough: the slowly rising trend of the current-price series is converted to a relatively flat one, and the current-price cycle of the early 1870s is mitigated by the broadly parallel cycle in the cost of living (and the cost of maintaining the troops). This series is accordingly accepted, with only two corrections. The first reintroduces the 1866 war spike. At current prices, 202 million lire were removed; deflated by the value-added-per-person indices (those underlying panel C, part E) for officers and other military, with weights equal to (1/12) and (11/12), respectively, these are equivalent to 278 million lire. The second is another war spike, apparently missed by the current-price series, added in 1870, the year Rome was wrested from the Pope. The *Annuario 1884*, p. 348, lists 320,885 non-officers serving at the end of September of that year, or twice as many as in 1881; since the campaign was brief, only 75 million lire, at 1911 prices, are added here.

Over the later decades, on the other hand, that series yields a long decline from the late 1880s, through the turn of the century, to 1905. It is then heir to the same criticism as the centenary Istat series (footnote 93): when times were flush public employment and its remuneration rose together, and vice versa; the sustained opposite movements in the deflated series (essentially an employment series) and the current-price series (ibid., part (a)) from 1895 to 1905 make no sense at all. The source of this nonsense is strictly speaking not the forcing of the initial series to match the benchmarks themselves, but the smooth distribution of the census-year discrepancies over the entire interbenchmark periods. That smooth distribution boasts computational convenience, and reflects if one will the "flat priors" that come with ignorance; what the results are telling us is that the assumptions that would justify it are unwarranted, and our priors are best revised.

The revision of the estimates proceed as follows. To avoid much cumbersome repetition, the current-price value added series will be referred to as *V*, the initial deflated series as *X*, that series forced ("smoothly") through the benchmarks as *Y*, and the (final) revised series as *Z*. Between 1901 and 1911, constant-price value added almost surely grew monotonically, and at increasing rates, like *X* and *V* itself. Here, *Z* is obtained by extrapolating the 1901 benchmark forward to 1913 at annual rates uniformly equal to 43 percent of those displayed by *X* (incidentally recovering the 1,239 million lire benchmark in 1911): in essence, both Y and Z force X through the benchmarks, but where Y rotates X (turning slow growth into decline), Z merely flattens it (so growth, however slow, remains growth).

Between 1881 and 1901, some arbitrariness is inevitable. From 1894 to 1901, both *X* and *V* grow quasi-monotonically, and neither displays a break in 1901 itself; over those years, therefore, *Z* is obtained with the same algorithm as used in 1901-13. The resulting estimate for 1894 equals 1,015 million lire, some 16 percent above the 1881 benchmark (against nearer 20 percent for *Y*, 28 percent for *V*, and no less than 40 percent for *X*). The further backward extrapolation is complicated by the intervening cycle, as all the available series point to sustained growth to 1889, and then decline. Real growth under the fiscally lax governments of the Left (in power from 1878) is not constrained by reasonable expectations; but the real decline was surely constrained, and something can be made of that.

From 1889 to 1894, salaries were cut, wages and maintenance costs fell (panel B, part (b)); but outright firing was politically even more damaging than pay cuts, so the real reduction in civilian employment was probably close to that allowed by mere attrition, surely no more than a very low percentage per year. The military were more flexible, but data are scarce; in 1898 serving soldiers were practically twice those serving in 1881, and the path of the number of serving officers suggests that the army grew from 1881 to 1889, and then essentially leveled off (*Annuario 1884*, p. 346, *1900*, pp. 1072, 1081). With military personnel accounting for some 30 percent of value added in those years (panel C, part E), annual real attrition is here estimated at a round 1 percent of the total, for a cumulated reduction from 1889 to 1894 of 5 percent, and a reasonable near-equal division of the 11-

percent decline in *V* into a real change and a price change. In 1889, therefore, 1911-price value added is here estimated as (1,015/.95) = 1,068 million lire: 22 percent above the 1881 benchmark, or again half the 44 percent increase in *V* (and against 47 and 34 percent increases in X and Y, respectively). From 1881 to 1894, *Z* is obtained by forcing *X*, in the ordinary way, from the 1881 benchmark through that estimate for 1889 to that for 1894.

The impact of these revisions is also illustrated in Table 10, panel B, part (d). The final estimates are transcribed directly in Table 1, col. 24, and illustrated (also) in Figure 1, panel C6.

5. GROSS DOMESTIC PRODUCT

5.1 GDP and net indirect taxes

Table 1, col. 26 reports the sum of the value added estimates for agriculture (col. 1), industry (col. 18), and the services (col. 25); the quality rating of just 2 is inevitable. The GDP series in col. 28 is that total-value-added figure, further augmented by the net-indirect-taxes series in col. 27.

The net-indirect-taxes series in col. 27 is unchanged from Fenoaltea (2005). As explained at the time (ibid., p. 310) it is Vitali's "centennial" series, merely rescaled to fit his "benchmark" estimate for 1911 in Rey (1992); no further work has been done on it, and it warrants a quality rating of 1.[101] The 2005 and sesquicentennial series are illustrated together in Figure 1, panel D: they appear to be much the same series, with the latter anchored to the "centennial" current-price estimate (Istat's 1,568 million lire) rather than the lower "benchmark" figure used here.[102] From 1871 to 1911, the discrepancy between the two series is of the order of 1 percent of GDP.

Col. 28 transcribes the estimates of (so-called) GDP, the sum of cols. 26 and 27; the latter is a mere adjunct to the former, and their sum earns the sempiternal, unflattering quality rating of 2. These estimates are illustrated, with their immediate predecessors, in Figure 1, panel E. Panel F there illustrates the relative correction introduced by the present revision, highlighting the reduction in GDP after the turn of the century; panel G illustrates to the same scale the major sectors' value added, and panel H their annual growth rates, highlighting their relative contribution to the fluctuations of GDP itself.

5.2 The composition of GDP: allowing for changes in relative prices

The composition of GDP at 1911 prices can be computed from the series in Table 1; but it is not a particularly useful exercise, as save for 1911 itself it is simply based on the wrong prices, those of 1911 rather than those of the year in question. It yields results that are basically meaningless, somewhat as if one calculated the age distribution of the native-born and that of immigrants, and

[101] The outliers in the mid-1860s are suspect, as it is hard to see how indirect taxation could have been imposed at sharply varying rates.

[102] Vitali's benchmark in Rey (2002) reproduced the unrevised Istat figure, apparently through an oversight, whence its recovery by Baffigi. Small discrepancies remain. The present series simply rescaled the centennial constant-price series. Baffigi's work sheets suggest he forced the centennial current-price series through the Rey (2002) benchmark in 1891 and a new benchmark for 1871, and then deflated it using the ratio of the centennial constant-price and current-price series. Why this procedure yielded year-to-year variations that differ (albeit little) from those generated by the centennial constant-price series (incorporated here), interbenchmark trends aside, is not clear. These apart, the discrepancy between the two series drifts from about half of one percent of GDP in the early 1870s to about one percent in the early 1890s, and back to about half that in 1911.

combined them using native-born and immigrant proportions borrowed from some other time and place: the result is simply *not* the age distribution of the entire population.

To obtain meaningful sector shares (of total value added, indirect taxes are here irrelevant) we would need current-price value added estimates, those that pave the way to the third-generation estimates (Fenoaltea 2020b, §1.2); the available second-generation estimates are simply inadequate. At present, all one can do is to tweak the second-generation estimates, allowing for their known sources of bias, to obtain conjectural third-generation levels and shares; this is done here, simply repeating the analogous calculation in Fenoaltea (2011b). The results are collected in Table 2 and illustrated in Figure 2.

The share series (Table 2, cols. 4–6) are obtained first, through a simple enough algorithm. The "benchmark" corpus yielded 1911 shares at current prices, and 1891 shares at both current and 1911 prices. The twentieth root of the ratio of the 1891 current-price share to the 1891 1911-price share is an estimate, for each major sector, of the annual change in shares, as between current and constant prices; sector-specific share-correction series are generated by using those annual rates to extrapolate 1911 = 1.00. From 1881 to 1913 the corrected shares in Table 2 are the product of the sector shares at 1911 prices and the corresponding share-correction factor, barely rescaled to sum to one; from 1861 through 1880 they are the shares so obtained for 1881, extrapolated back to 1861 in direct proportion to the 1911-price sector shares and similarly barely rescaled. The underlying assumption is that industry's share rises, going back in time, because it experienced faster productivity growth than the other sectors did – but only from 1881 (or so), with the first sustained industrial boom; prior to that it presumably remained overwhelmingly artisanal, and its productivity growth did not exceed that of agriculture or the services [103]

5.3 The composition of GDP: an *ISIC*-based redistribution

As noted (Fenoaltea 2020b, §3.1), the present production-side value added estimates in Table 1 respect the Italian accounting conventions used by their immediate predecessors, which differ in places from the *ISIC*; this enhances comparability within the national literature, and limits it in the international literature. This last is unfortunate; an *ISIC*-based recalculation of major-sector levels and shares (of total value added) is presented here in Table 3. It is no more than a first approximation, because a close reading of the *ISIC* can raise blood pressure and anticipate dementia; some things may have been missed, but the big-ticket items should all be allowed for, and not only those.

The exercise does not touch the estimates of value added in agriculture, indirect business taxes, or GDP; what it involves is the transfer of a number of activities, and the corresponding value added, from industry to the services. The estimates of the elements so transferred are collected for convenience in Table 11.

Table 11, col. 1 refers to printing and publishing, as the *ISIC* (now) considers the production of books, newspapers, and the like a service (group 58, in section J, Information and communication). In the author's work, still preliminary and not in the public domain, the paper sequence is represented by three series, that refer respectively to pulp, paper, and paper products. The pulp and paper products physical-output series are extrapolated from the paper series in the usual way, allowing for input-output ratios and international trade, and allowing too for the share of paper directly consumed as such (a constant 60 percent of the available total, as suggested by data for 1911); the paper series is

[103] It may be noted that this use of the "benchmark" estimates does not require that they got the sector shares right, but only that they were sufficiently consistent to get the relative changes in sector shares approximately right. A recalculation of the 1891 current-price benchmark to obtain figures directly comparable to those for 1911 would eliminate this particular source of error, but would cost far more than it seems to be worth.

built up from output data in 1907 and 1909–13 and benchmark estimates for 1862, 1876, 1896, 1903 and 1906 derived from data on the stock of paper-making machines, interpolating the missing values. Value added in paper products is estimated as the sum of five components: some 60 million lire of newspapers, from 10.4 million lire of newsprint; equal tonnages of stationery, other paper products, and books, worth 18, 54, and 90 million lire, respectively, from paper worth 34.8 million lire; and 8 million lire of cardboard products, from 3.8 million lire of cardboard. Inflating raw material costs by some 12.2 percent (from a total of 49 million lire to 55 million) to allow for power, inks, glue, and other omitted items, value added in printing and publishing is here accordingly estimated as 48.3 million lire in newspapers, and 77.0 million lire in books; the value added series in Table 11, col. 1 is their sum (125.3 million lire), extrapolated in proportion to the "paper products" series described above.

Table 11, col. 2 refers to the repair of shoes (and other leather products), in the *ISIC* as category 9523 (in section S, other service activities); it is transcribed directly from Fenoaltea (2019), Summary Table H.1, col. 55.

Table 11, cols. 3–5 refer to minor maintenance activities, of consumer durables (other than houses, counted as construction, and textile products, already counted in the services). These refer to production the *ISIC* counts as consumption rather than investment (Fenoaltea 2020a, Appendix A: there is method in their madness), and are accordingly derived below, in the calculation of the expenditure side. Col. 3 refers to value added in the maintenance of fabricated metal (including the sharpening of knives); col. 4, to that in the maintenance of general equipment (vehicles, sewing machines); col. 5, to that in the maintenance of precision equipment (including, signally, the repair of clocks and watches). These series transcribe, for convenience, Fenoaltea (2018), Table A5, cols. 1, 3, and 5.

Table 11, col. 6 is the sum of cols. 1–5, the total value added transferred from industry to the services. It represents a cut to industry rising (with cyclical variations) from some 5 percent at Unification to 6 percent in the late 1890s, and declining back to ca. 5 percent in 1913, and a boost to the services growing relatively steadily from some 3 percent at Unification to 4 percent in the last few years of the *belle époque*.

The *ISIC*-style estimates of 1911-price value added in industry and the services are transcribed in Table 3, cols. 2–3, and the resulting sector shares in cols. 5–6; the impact of the reclassification can be seen in Figure 3.

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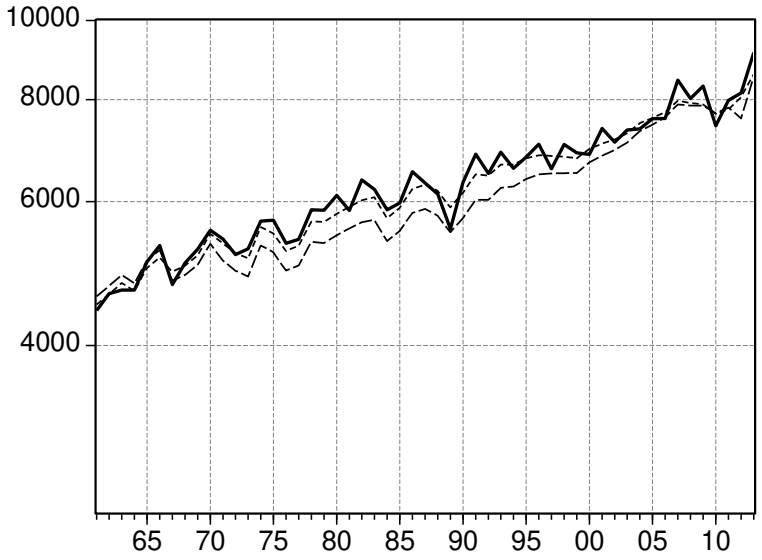
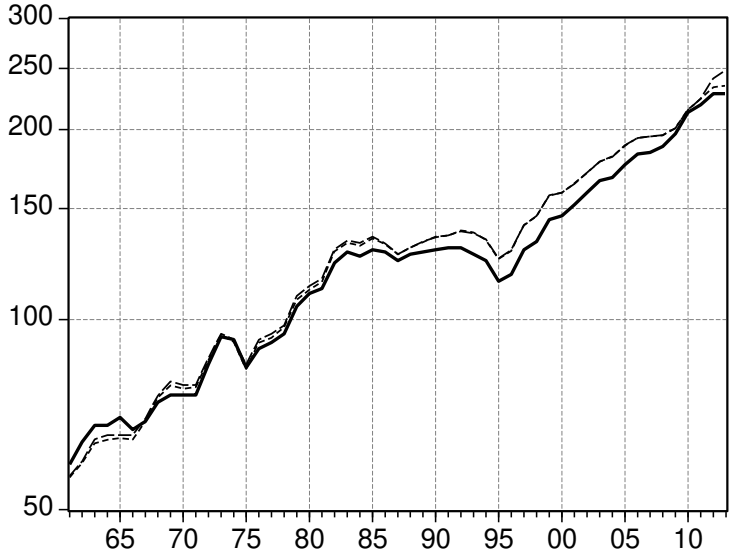
Figure 1
Production series at 1911 prices, 1861–1913, Italian-standard classification (million lire)

A. Agriculture



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

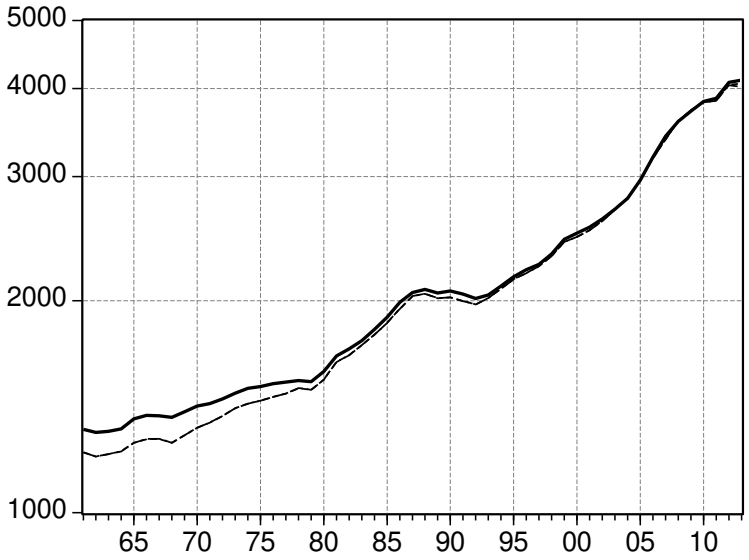
B1. Extractive industries



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

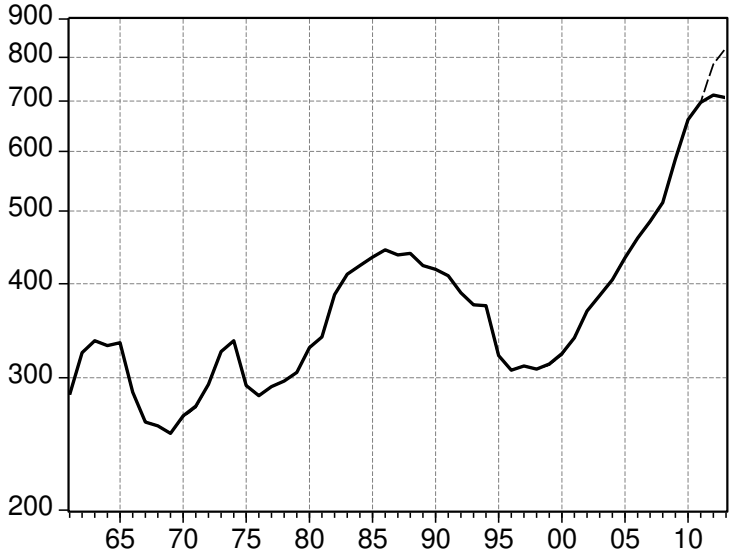
Figure 1, continued

B2. Manufacturing industries



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

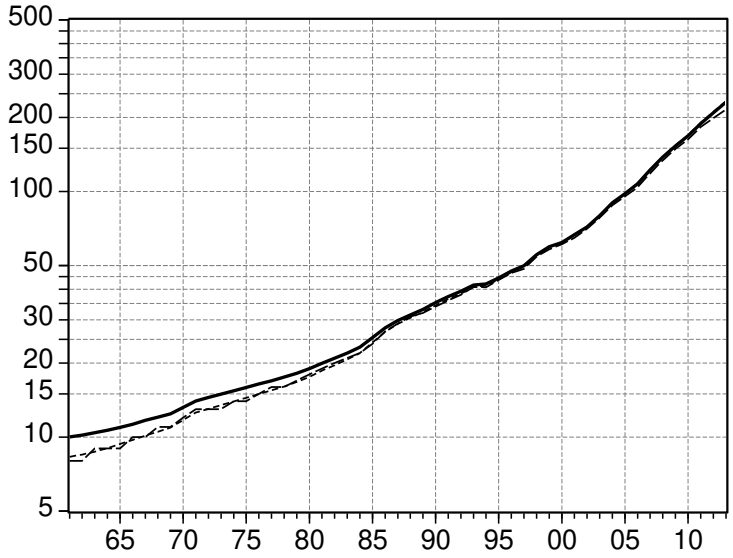
B3. Construction industries



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

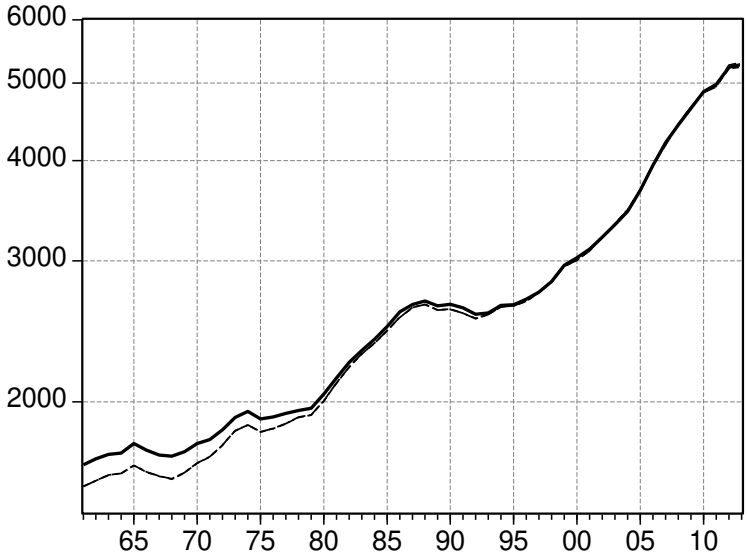
Figure 1, continued

B4. Utilities industries



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

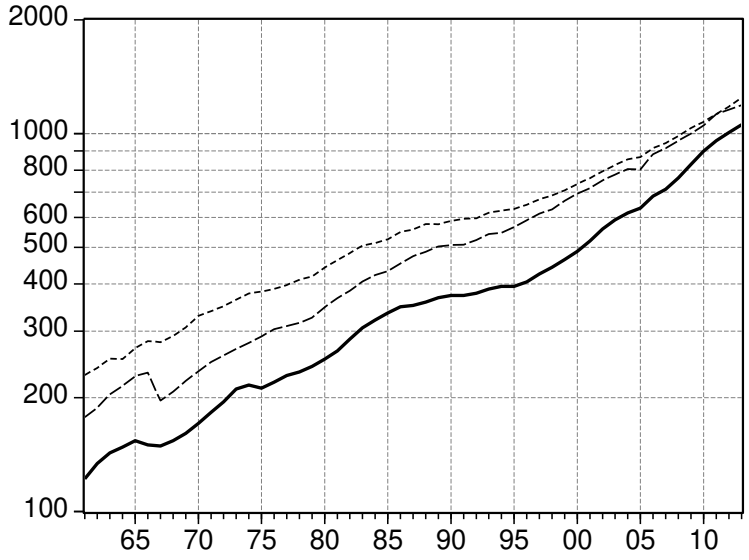
B. Industry



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

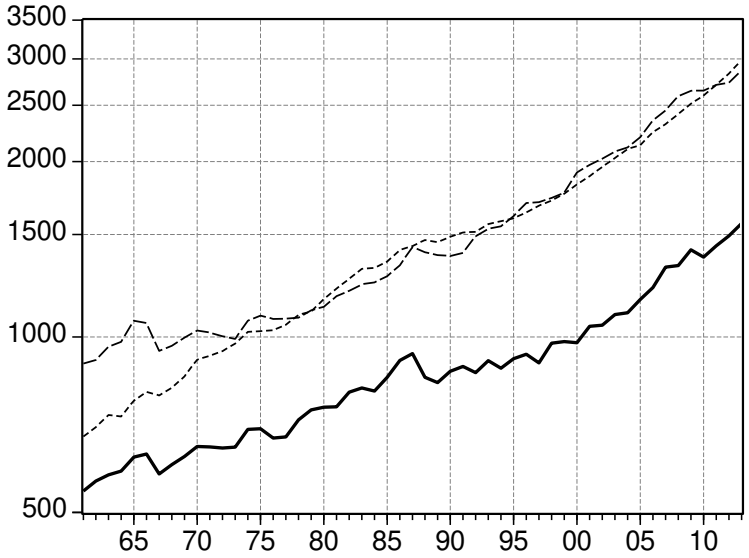
Figure 1, continued

C1. Transportation



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
revised second-generation

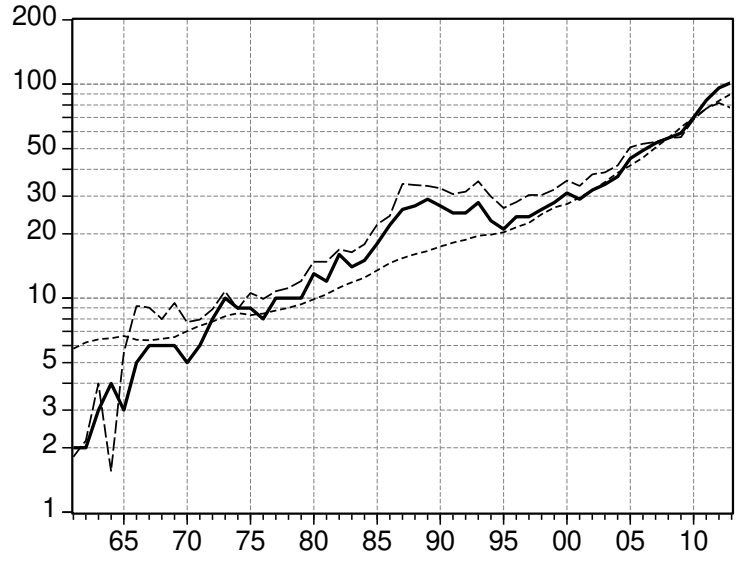
C2. Commerce



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
revised second-generation

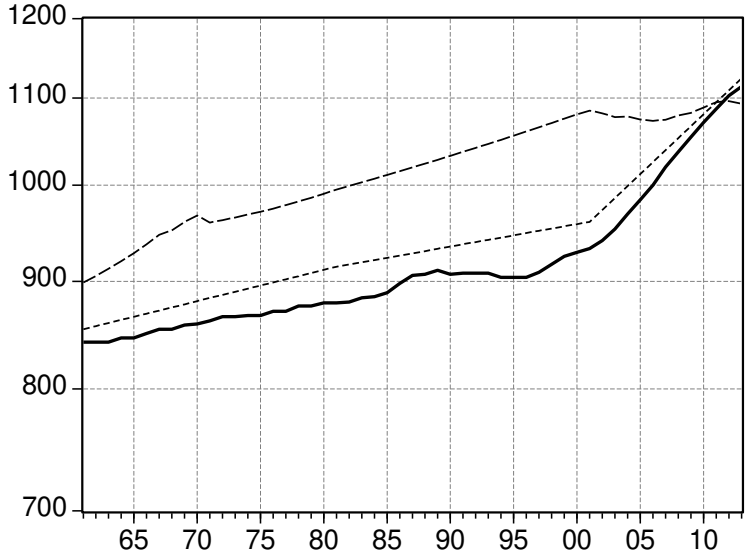
Figure 1, continued

C3. Net banking and insurance



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
——— revised second-generation

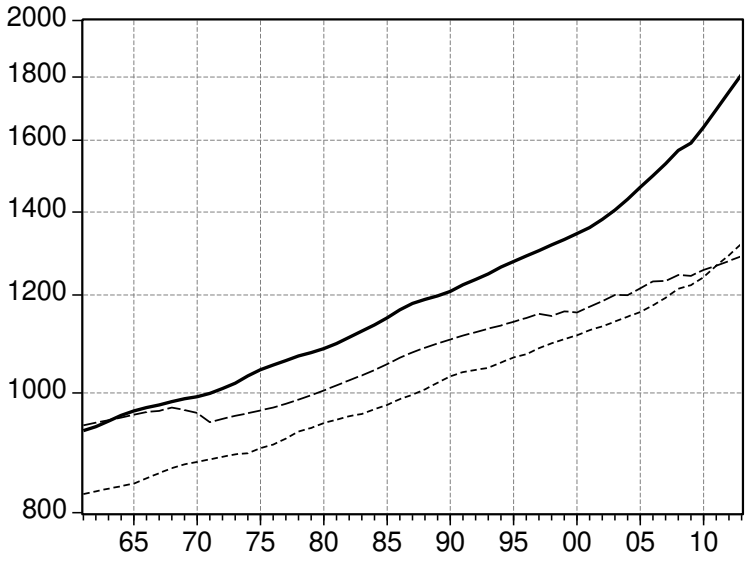
C4. Miscellaneous services



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
——— revised second-generation

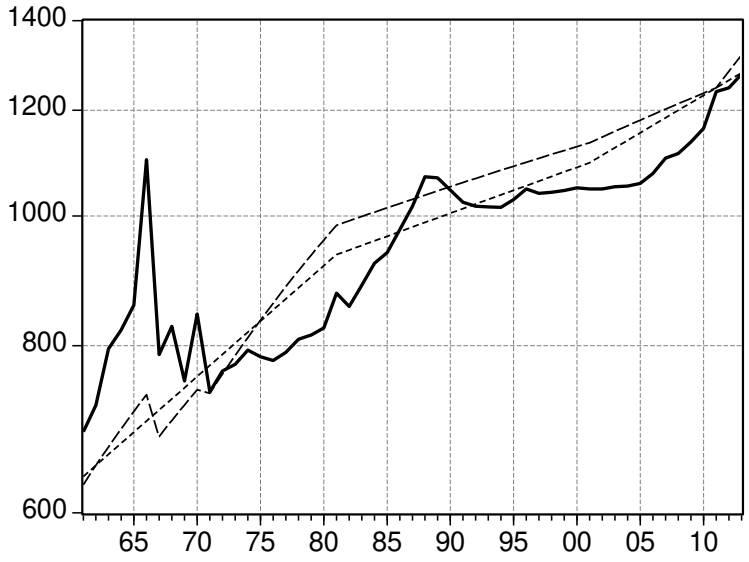
Figure 1, continued

C5. Buildings



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

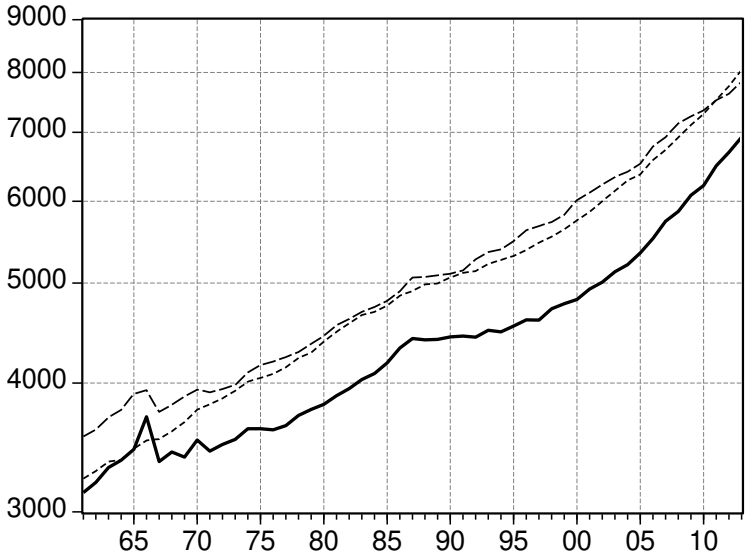
C6. Public administration



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
▬▬▬ revised second-generation

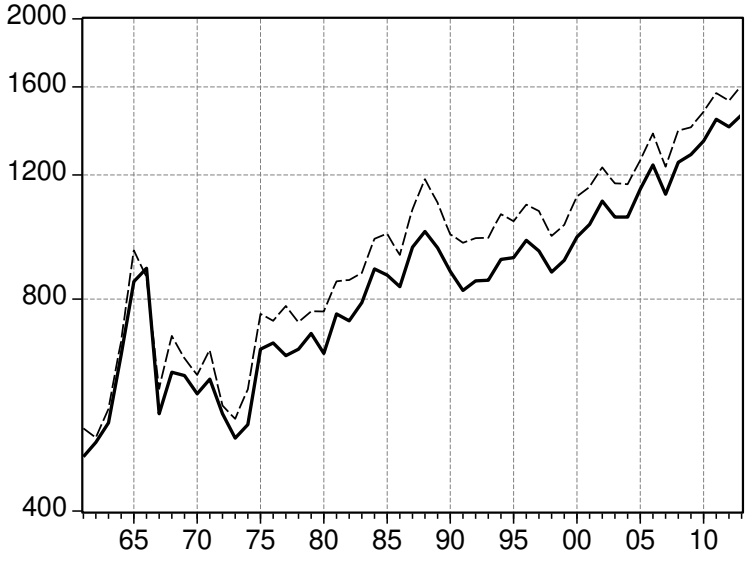
Figure 1, continued

C. Services



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
revised second-generation

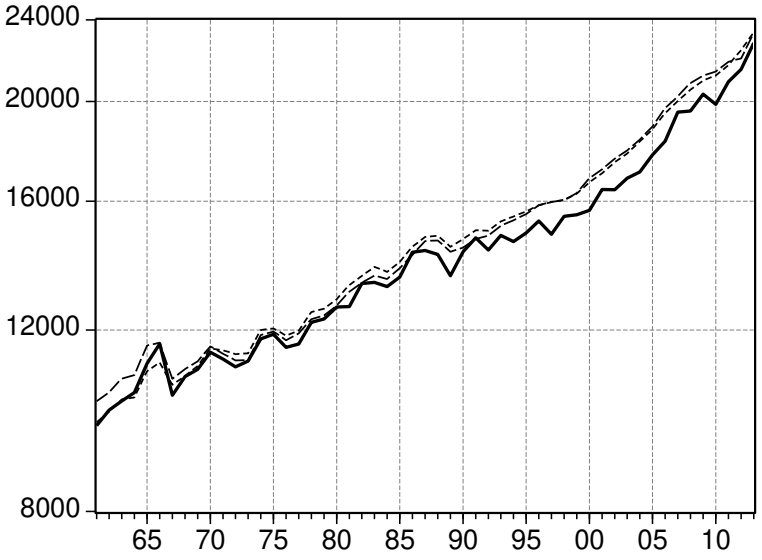
D. Net indirect taxes



——— preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
revised second-generation

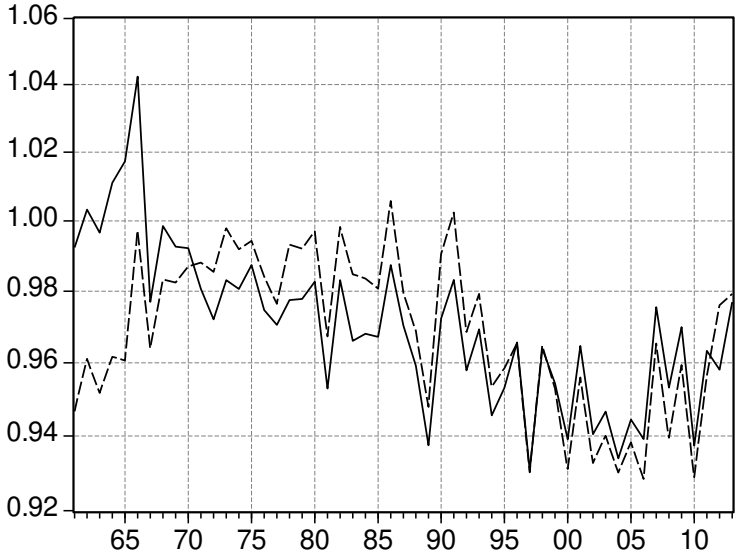
Figure 1, continued

E. GDP



-------- preliminary second-generation (Fenoaltea 2005)
— — — sesquicentenary (Baffigi 2011)
revised second-generation

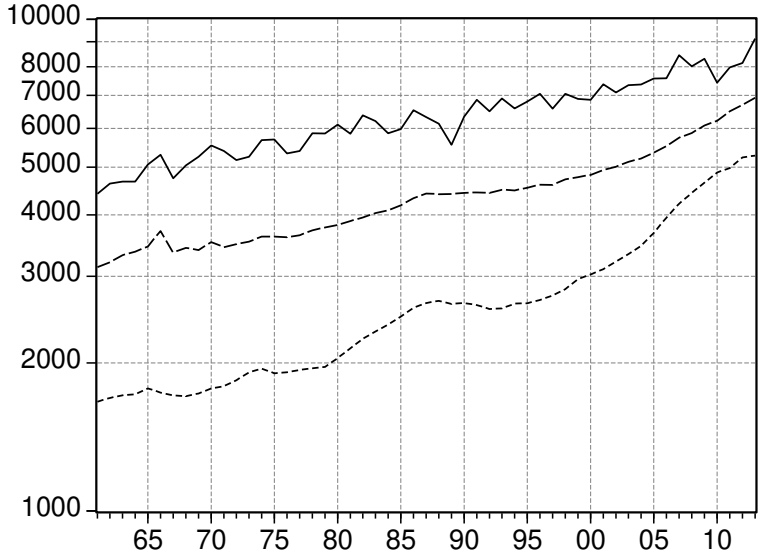
F. Gross domestic product: ratio of revised estimates to the previous estimates



——— ratio to preliminary second-generation (Fenoaltea 2005)
— — — ratio to sesquicentenary (Baffigi 2011)

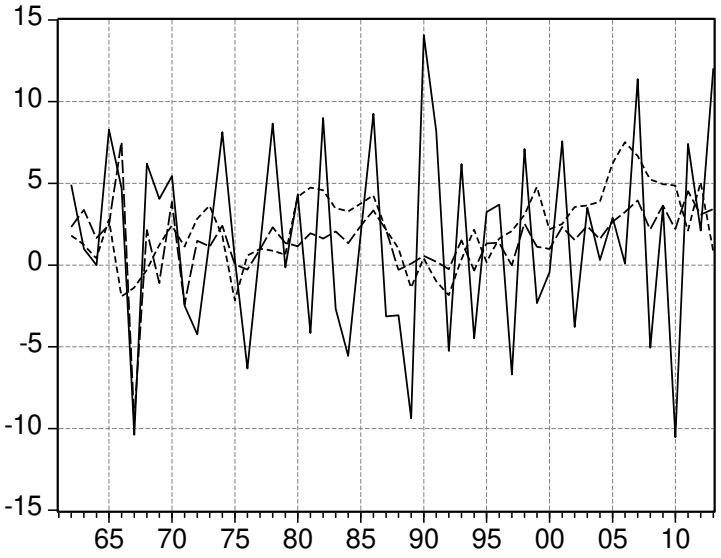
Figure 1, continued

G. Gross domestic product: major-sector paths



——— agriculture — — — services -------- industry

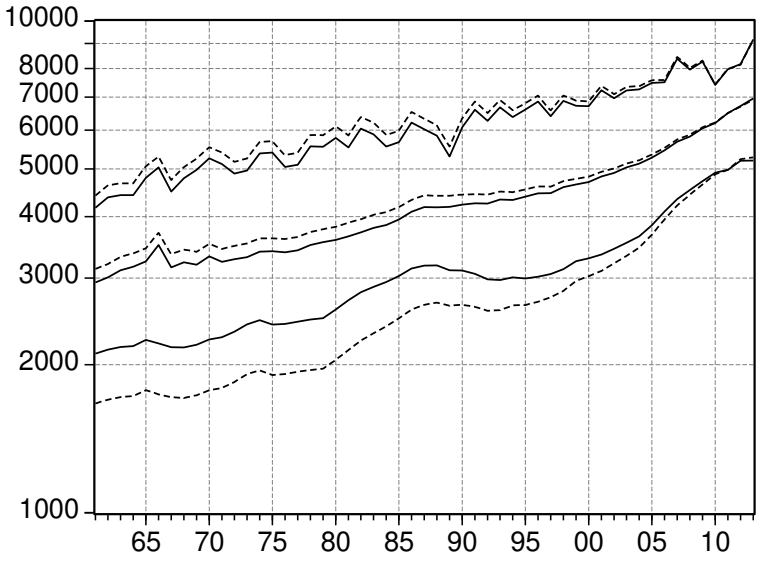
H. Gross domestic product: major-sector growth rates (percent)



——— agriculture -------- industry — — — services

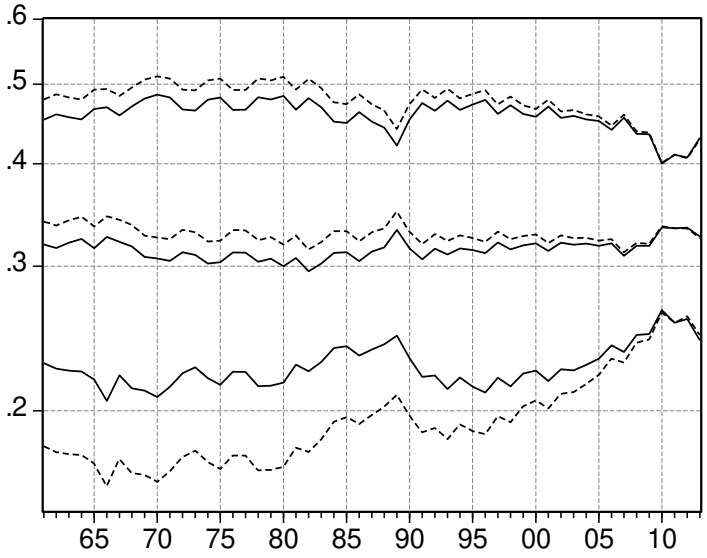
Figure 2
Conjectural production series at the 1911 price level, 1861–1913, Italian-standard classification

A. Levels (million lire)*



——— at the 1911 price level -------- at 1911 prices

B. Shares of aggregate value added*

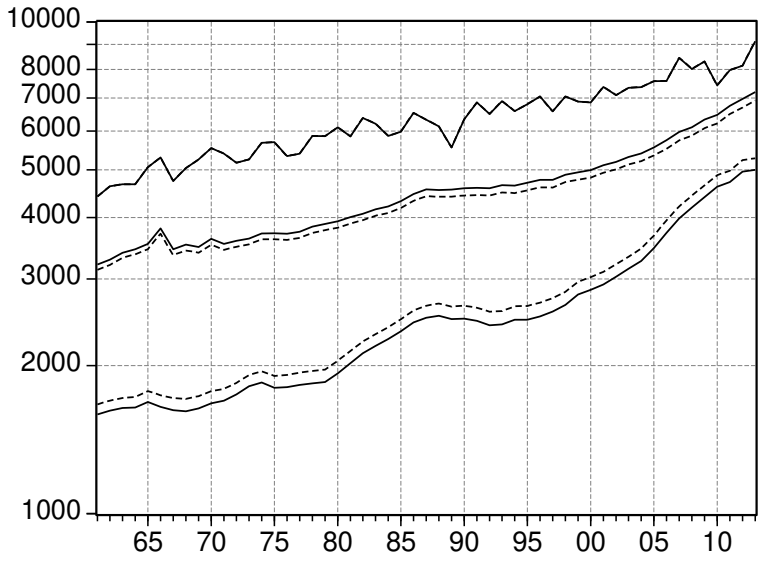


——— at the 1911 price level -------- at 1911 prices

*the top pair of lines refer to agriculture, the middle two to services, the bottom two to industry

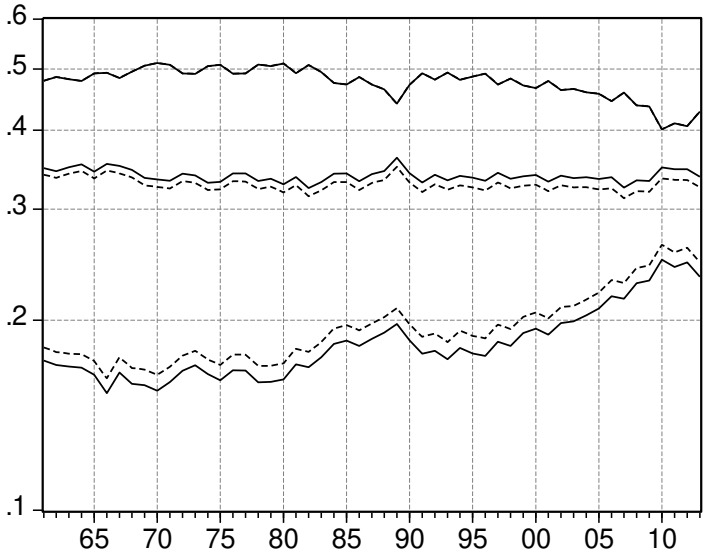
Figure 3
Production series at 1911 prices, 1861–1913: approximate *ISIC*-standard classification
(million lire)

A. Levels (million lire)*



——— *ISIC*-standard -------- Italian-standard

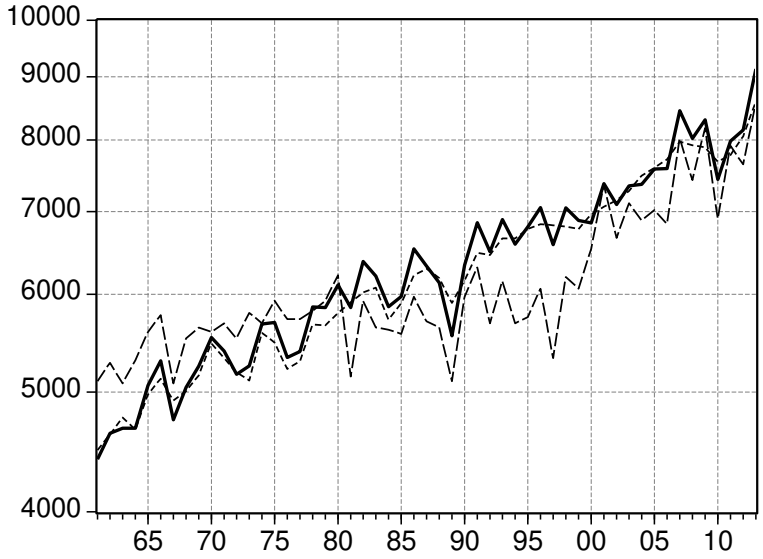
B. Shares of aggregate value added*



——— *ISIC*-standard -------- Italian-standard

*the top line refers to agriculture, the middle two to services, the bottom two to industry

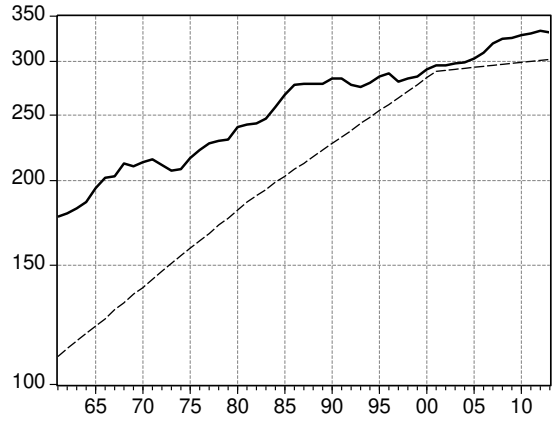
Figure 4
Value added in agriculture, 1861–1913 (million lire at 1911 prices)



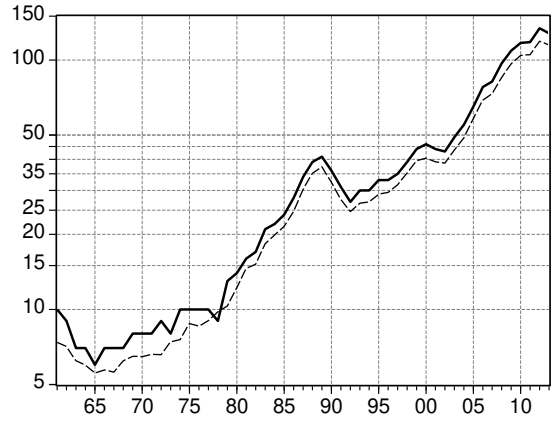
— — — Istat-Vitali (1969)
-------- Federico (2005)
revised estimates

Figure 5
Value added in industry, 1861–1913 (million lire at 1911 prices)

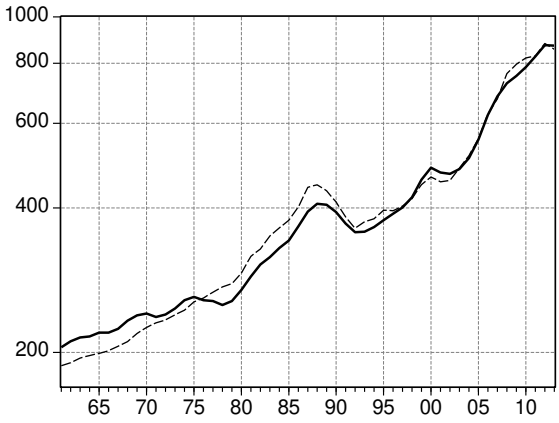
A. Leather industries



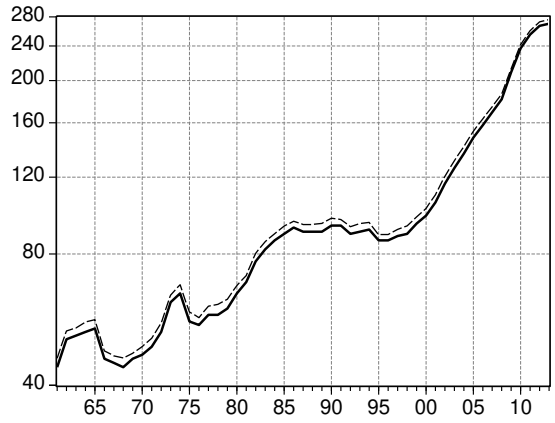
B. Metal industries



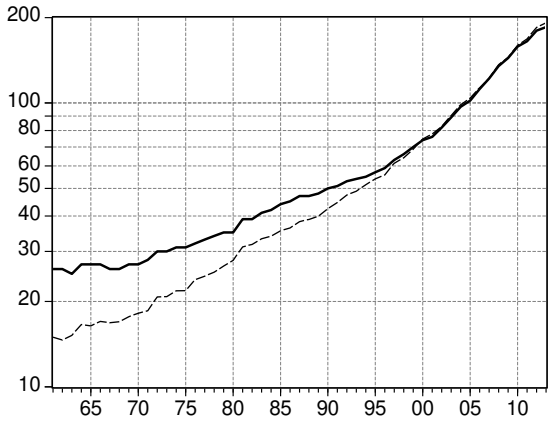
C. Engineering industries



D. Non-met. min. products industries



E. Chemical and rubber industries



revised estimates — — — Fenoaltea (2003/2005)

Table 1. Production series at 1911 prices, 1861-1913,
Italian-standard classification (million lire)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	value added		value added in industry						
			manufacturing						
	in agri- culture	extrac- tive	food	tobacco	textiles	apparel	leather	wood	metal
vintage:	**2019**	**2015**	2003	2003	2003	2003	**2019**	2003	**2015**
quality:	2	4	1	1	4	4	4	2	4
1861	4,413	59	434	20	122	88	177	155	10
1862	4,630	64	433	20	118	87	179	132	9
1863	4,676	68	435	20	121	87	182	127	7
1864	4,676	68	437	20	119	89	186	127	7
1865	5,063	70	438	20	114	92	195	156	6
1866	5,300	67	439	20	117	90	202	169	7
1867	4,750	69	441	20	117	91	203	160	7
1868	5,045	74	443	20	118	91	212	131	7
1869	5,249	76	446	19	125	93	210	136	8
1870	5,535	76	450	20	128	93	213	146	8
1871	5,397	76	455	21	140	94	215	136	8
1872	5,168	85	459	23	140	97	211	141	9
1873	5,250	94	463	23	147	101	207	142	8
1874	5,677	93	467	24	149	103	208	137	10
1875	5,694	84	468	22	149	104	216	141	10
1876	5,334	90	469	25	137	106	222	156	10
1877	5,394	92	470	25	135	106	227	156	10
1878	5,861	95	474	22	143	106	229	156	9
1879	5,853	105	474	21	140	104	230	141	13
1880	6,106	110	481	22	150	110	240	136	14
1881	5,852	112	491	21	166	120	242	151	16
1882	6,379	123	494	20	166	122	243	156	17
1883	6,208	128	500	21	175	124	247	156	21
1884	5,863	126	506	24	177	131	257	171	22
1885	5,976	129	513	24	185	137	268	190	24
1886	6,529	128	520	24	192	143	277	219	28
1887	6,324	124	526	23	203	145	278	228	34
1888	6,130	127	533	23	220	142	278	204	39
1889	5,555	128	535	22	221	140	278	176	41
1890	6,337	129	542	22	229	143	283	176	36
1891	6,856	130	545	21	228	141	283	176	31
1892	6,496	130	547	22	224	140	277	171	27
1893	6,897	127	554	22	229	144	275	171	30
1894	6,588	124	565	22	252	148	279	175	30
1895	6,802	115	577	22	267	157	285	180	33
1896	7,053	118	584	21	273	162	288	194	33
1897	6,581	129	591	21	279	162	280	204	35
1898	7,048	133	601	21	293	164	283	223	39
1899	6,884	144	616	21	310	170	285	242	44
1900	6,855	146	631	22	308	170	292	233	46
1901	7,374	152	644	22	324	173	296	247	44
1902	7,094	159	661	22	339	181	296	257	43
1903	7,343	166	680	23	343	187	298	272	49
1904	7,365	168	684	23	358	189	299	277	55
1905	7,578	176	706	24	371	194	303	301	65
1906	7,585	183	739	24	402	214	309	311	78
1907	8,448	184	776	25	442	241	319	331	82
1908	8,021	188	799	26	450	248	324	360	97
1909	8,306	197	799	27	450	250	325	389	109
1910	7,431	213	823	28	433	243	328	400	117
1911	7,982	219	827	28	428	243	330	386	118
1912	8,150	228	872	29	475	255	333	367	134
1913	9,131	228	909	26	475	253	331	362	128

Table 1, continued

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	value added in industry (cont.)								
	manufacturing (cont.)								
	engi-neer'g	non-met. min. pr.	chem., rubber	paper, printing	sundry mfg.	total mfg.	construc-tion	utili-ties	total industry
vintage:	**2015**	**2015**	**2015**	2003	2003	**2019**	2003	**2015**	**2019**
quality:	4	4	4	3	1	2	4	4	3
1861	205	44	26	25	8	1,314	285	10	1,668
1862	211	51	26	26	8	1,300	324	10	1,698
1863	215	52	25	26	8	1,305	336	10	1,719
1864	216	53	27	27	8	1,316	331	11	1,726
1865	220	54	27	29	8	1,359	334	11	1,774
1866	220	46	27	30	8	1,375	287	11	1,740
1867	224	45	26	31	8	1,373	262	12	1,716
1868	233	44	26	33	8	1,366	259	12	1,711
1869	239	46	27	34	8	1,391	253	12	1,732
1870	241	47	27	36	9	1,418	267	13	1,774
1871	237	49	28	37	9	1,429	275	14	1,794
1872	240	53	30	39	9	1,451	294	14	1,845
1873	247	62	30	39	9	1,478	325	15	1,912
1874	257	65	31	42	9	1,502	336	15	1,946
1875	261	56	31	44	9	1,511	293	16	1,904
1876	257	55	32	46	10	1,525	284	16	1,915
1877	256	58	33	47	10	1,533	292	17	1,934
1878	251	58	34	49	10	1,541	297	18	1,951
1879	256	60	35	51	10	1,535	305	18	1,963
1880	270	65	35	53	10	1,587	329	19	2,045
1881	288	69	39	56	11	1,670	340	20	2,142
1882	305	77	39	59	11	1,709	387	21	2,240
1883	316	82	41	62	11	1,756	412	22	2,318
1884	330	86	42	65	11	1,822	423	23	2,394
1885	342	89	44	69	11	1,896	434	25	2,484
1886	366	92	45	73	11	1,990	444	28	2,590
1887	393	90	47	76	12	2,055	437	30	2,646
1888	408	90	47	80	12	2,076	439	31	2,673
1889	406	90	48	83	12	2,052	423	33	2,636
1890	392	93	50	87	12	2,065	418	35	2,647
1891	371	93	51	91	13	2,044	410	37	2,621
1892	356	89	53	96	13	2,015	389	39	2,573
1893	357	90	54	99	13	2,038	375	42	2,582
1894	365	91	55	103	13	2,098	374	42	2,638
1895	377	86	57	108	14	2,163	321	44	2,643
1896	389	86	59	111	14	2,214	307	47	2,686
1897	401	88	63	114	14	2,252	311	50	2,742
1898	421	89	66	116	14	2,330	308	55	2,826
1899	458	94	70	119	15	2,444	313	60	2,961
1900	485	98	74	121	15	2,495	323	62	3,026
1901	474	105	76	123	16	2,544	339	67	3,102
1902	471	116	82	128	17	2,613	368	72	3,212
1903	482	126	89	130	18	2,697	386	80	3,329
1904	508	136	97	150	19	2,795	405	90	3,458
1905	555	148	102	177	20	2,966	433	98	3,673
1906	625	158	112	206	21	3,199	460	107	3,949
1907	683	169	122	211	22	3,423	484	122	4,213
1908	727	181	135	224	23	3,594	513	138	4,433
1909	753	209	144	237	24	3,716	586	153	4,652
1910	786	237	158	248	25	3,836	661	168	4,878
1911	827	255	165	242	27	3,876	697	189	4,981
1912	873	267	180	270	28	4,083	713	209	5,233
1913	871	270	185	273	29	4,112	707	231	5,278

Table 1, continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
	value added in services									
	trans-port.	commerce	net b'g and ins.	misc. serv.	buil-dings	public admin.	total serv.	total value added	net indirect taxes	gross domestic product
vintage:	**2019**	**2019**	**2019**	**2019**	**2019**	**2017**	**2019**	**2019**	2005	**2019**
quality:	3	3	2	1	3	2	2	2	1	2
1861	122	544	2	842	932	690	3,132	9,213	478	9,691
1862	134	566	2	842	939	722	3,205	9,533	501	10,034
1863	143	580	3	842	949	796	3,313	9,708	534	10,242
1864	148	589	4	846	959	822	3,368	9,770	667	10,437
1865	154	622	3	846	967	858	3,450	10,287	847	11,134
1866	150	630	5	850	973	1,102	3,710	10,750	885	11,635
1867	149	582	6	854	978	788	3,357	9,823	550	10,373
1868	154	604	6	854	984	827	3,429	10,185	630	10,815
1869	161	624	6	858	989	753	3,391	10,372	623	10,995
1870	171	649	5	859	993	845	3,522	10,831	587	11,418
1871	183	648	6	862	999	739	3,437	10,628	616	11,244
1872	195	645	8	866	1,008	766	3,488	10,501	550	11,051
1873	211	647	10	866	1,018	775	3,527	10,689	508	11,197
1874	216	694	9	867	1,032	794	3,612	11,235	531	11,766
1875	212	696	9	867	1,044	785	3,613	11,211	679	11,890
1876	220	671	8	871	1,053	780	3,603	10,852	693	11,545
1877	229	674	10	871	1,062	791	3,637	10,965	665	11,630
1878	234	721	10	876	1,071	809	3,721	11,533	679	12,212
1879	242	750	10	876	1,078	815	3,771	11,587	715	12,302
1880	253	758	13	879	1,086	825	3,814	11,965	670	12,635
1881	266	759	12	879	1,096	876	3,888	11,882	762	12,644
1882	286	804	16	880	1,109	856	3,951	12,570	745	13,315
1883	306	818	14	884	1,122	888	4,032	12,558	791	13,349
1884	321	808	15	885	1,135	922	4,086	12,343	883	13,226
1885	335	853	18	889	1,150	939	4,184	12,644	865	13,509
1886	348	912	22	898	1,167	977	4,324	13,443	833	14,276
1887	351	937	26	906	1,181	1,017	4,418	13,388	948	14,336
1888	358	853	27	907	1,190	1,070	4,405	13,208	998	14,206
1889	368	835	29	911	1,198	1,068	4,409	12,600	946	13,546
1890	373	873	27	907	1,208	1,046	4,434	13,418	876	14,294
1891	373	890	25	908	1,223	1,024	4,443	13,920	823	14,743
1892	378	869	25	908	1,235	1,017	4,432	13,501	849	14,350
1893	388	911	28	908	1,248	1,016	4,499	13,978	851	14,829
1894	394	884	23	904	1,264	1,015	4,484	13,710	911	14,621
1895	394	918	21	904	1,277	1,029	4,543	13,988	916	14,904
1896	405	934	24	904	1,290	1,048	4,605	14,344	969	15,313
1897	425	903	24	909	1,303	1,040	4,604	13,927	936	14,863
1898	443	976	26	917	1,317	1,042	4,721	14,595	874	15,469
1899	464	982	28	925	1,330	1,045	4,774	14,619	908	15,527
1900	488	978	31	929	1,345	1,050	4,821	14,702	980	15,682
1901	520	1,043	29	933	1,360	1,048	4,933	15,409	1,021	16,430
1902	559	1,048	32	941	1,381	1,048	5,009	15,315	1,102	16,417
1903	591	1,093	34	953	1,405	1,052	5,128	15,800	1,046	16,846
1904	616	1,101	37	969	1,434	1,053	5,210	16,033	1,046	17,079
1905	635	1,160	45	984	1,466	1,058	5,348	16,599	1,146	17,745
1906	683	1,216	49	1,000	1,498	1,076	5,522	17,056	1,240	18,296
1907	712	1,318	53	1,020	1,532	1,105	5,740	18,401	1,127	19,528
1908	763	1,326	56	1,037	1,570	1,114	5,866	18,320	1,251	19,571
1909	828	1,411	59	1,054	1,592	1,136	6,080	19,038	1,283	20,321
1910	899	1,371	70	1,071	1,640	1,163	6,214	18,523	1,341	19,864
1911	957	1,434	84	1,087	1,694	1,239	6,495	19,458	1,440	20,898
1912	1,006	1,492	96	1,103	1,751	1,247	6,695	20,078	1,405	21,483
1913	1,055	1,567	102	1,114	1,809	1,277	6,924	21,333	1,461	22,794

Source: see text.

Table 2. Conjectural production series at the 1911 price level, 1861–1913, Italian-standard classification (million lire)

	(1)	(2)	(3)	(4)	(5)	(6)
	value added (million lire)			shares		
	agric.	industry	services	agric.	industry	services
1861	4,169	2,106	2,938	.45	.23	.32
1862	4,378	2,146	3,009	.46	.23	.32
1863	4,423	2,173	3,112	.46	.22	.32
1864	4,424	2,182	3,164	.45	.22	.32
1865	4,796	2,246	3,245	.47	.22	.32
1866	5,038	2,210	3,501	.47	.21	.33
1867	4,497	2,171	3,155	.46	.22	.32
1868	4,786	2,169	3,230	.47	.21	.32
1869	4,981	2,196	3,195	.48	.21	.31
1870	5,257	2,252	3,322	.49	.21	.31
1871	5,118	2,274	3,236	.48	.21	.30
1872	4,891	2,333	3,277	.47	.22	.31
1873	4,963	2,416	3,310	.46	.23	.31
1874	5,376	2,463	3,396	.48	.22	.30
1875	5,398	2,412	3,401	.48	.22	.30
1876	5,046	2,421	3,384	.47	.22	.31
1877	5,103	2,445	3,416	.47	.22	.31
1878	5,557	2,472	3,503	.48	.21	.30
1879	5,550	2,487	3,550	.48	.21	.31
1880	5,786	2,590	3,589	.48	.22	.30
1881	5,530	2,705	3,648	.47	.23	.31
1882	6,044	2,809	3,717	.48	.22	.30
1883	5,883	2,880	3,795	.47	.23	.30
1884	5,554	2,944	3,845	.45	.24	.31
1885	5,669	3,030	3,945	.45	.24	.31
1886	6,214	3,139	4,091	.46	.23	.30
1887	6,024	3,179	4,185	.45	.24	.31
1888	5,846	3,184	4,178	.44	.24	.32
1889	5,302	3,112	4,186	.42	.25	.33
1890	6,077	3,110	4,231	.45	.23	.32
1891	6,601	3,062	4,257	.47	.22	.31
1892	6,265	2,982	4,255	.46	.22	.32
1893	6,672	2,972	4,334	.48	.21	.31
1894	6,377	3,010	4,323	.47	.22	.32
1895	6,602	2,994	4,392	.47	.21	.31
1896	6,860	3,020	4,463	.48	.21	.31
1897	6,405	3,056	4,466	.46	.22	.32
1898	6,877	3,127	4,592	.47	.21	.31
1899	6,723	3,247	4,649	.46	.22	.32
1900	6,706	3,292	4,704	.46	.22	.32
1901	7,232	3,351	4,826	.47	.22	.31
1902	6,966	3,441	4,908	.45	.22	.32
1903	7,225	3,539	5,036	.46	.22	.32
1904	7,259	3,647	5,127	.45	.23	.32
1905	7,483	3,843	5,273	.45	.23	.32
1906	7,502	4,099	5,455	.44	.24	.32
1907	8,375	4,341	5,685	.46	.24	.31
1908	7,966	4,532	5,822	.43	.25	.32
1909	8,268	4,721	6,049	.43	.25	.32
1910	7,413	4,913	6,197	.40	.27	.33
1911	7,982	4,981	6,495	.41	.26	.33
1912	8,170	5,195	6,713	.41	.26	.33
1913	9,173	5,201	6,959	.43	.24	.33

Source: see text.

Table 3. Production series at 1911 prices, 1861-1913, approximate *ISIC*-standard classification (million lire)

	(1)	(2)	(3)	(4)	(5)	(6)
	value added (million lire)			shares		
	agric.	industry	services	agric.	industry	services
1861	4,413	1,591	3,209	.48	.17	.35
1862	4,630	1,620	3,283	.49	.17	.34
1863	4,676	1,640	3,392	.48	.17	.35
1864	4,676	1,644	3,450	.48	.17	.35
1865	5,063	1,687	3,537	.49	.16	.34
1866	5,300	1,648	3,802	.49	.15	.35
1867	4,750	1,623	3,450	.48	.17	.35
1868	5,045	1,615	3,525	.50	.16	.35
1869	5,249	1,637	3,486	.51	.16	.34
1870	5,535	1,676	3,620	.51	.15	.33
1871	5,397	1,697	3,534	.51	.16	.33
1872	5,168	1,747	3,586	.49	.17	.34
1873	5,250	1,815	3,624	.49	.17	.34
1874	5,677	1,847	3,711	.51	.16	.33
1875	5,694	1,802	3,715	.51	.16	.33
1876	5,334	1,809	3,709	.49	.17	.34
1877	5,394	1,826	3,745	.49	.17	.34
1878	5,861	1,840	3,832	.51	.16	.33
1879	5,853	1,851	3,883	.51	.16	.34
1880	6,106	1,929	3,930	.51	.16	.33
1881	5,852	2,023	4,007	.49	.17	.34
1882	6,379	2,119	4,072	.51	.17	.32
1883	6,208	2,194	4,156	.49	.17	.33
1884	5,863	2,265	4,215	.48	.18	.34
1885	5,976	2,348	4,320	.47	.19	.34
1886	6,529	2,448	4,466	.49	.18	.33
1887	6,324	2,502	4,562	.47	.19	.34
1888	6,130	2,526	4,552	.46	.19	.34
1889	5,555	2,486	4,559	.44	.20	.36
1890	6,337	2,493	4,588	.47	.19	.34
1891	6,856	2,465	4,599	.49	.18	.33
1892	6,496	2,416	4,589	.48	.18	.34
1893	6,897	2,425	4,656	.49	.17	.33
1894	6,588	2,478	4,644	.48	.18	.34
1895	6,802	2,479	4,707	.49	.18	.34
1896	7,053	2,519	4,772	.49	.18	.33
1897	6,581	2,575	4,771	.47	.18	.34
1898	7,048	2,658	4,889	.48	.18	.33
1899	6,884	2,791	4,944	.47	.19	.34
1900	6,855	2,853	4,994	.47	.19	.34
1901	7,374	2,925	5,110	.48	.19	.33
1902	7,094	3,032	5,189	.46	.20	.34
1903	7,343	3,148	5,309	.46	.20	.34
1904	7,365	3,265	5,403	.46	.20	.34
1905	7,578	3,465	5,556	.46	.21	.33
1906	7,585	3,724	5,747	.44	.22	.34
1907	8,448	3,982	5,971	.46	.22	.32
1908	8,021	4,193	6,106	.44	.23	.33
1909	8,306	4,403	6,329	.44	.23	.33
1910	7,431	4,622	6,470	.40	.25	.35
1911	7,982	4,725	6,751	.41	.24	.35
1912	8,150	4,960	6,968	.41	.25	.35
1913	9,131	5,001	7,201	.43	.23	.34

Source: see text.

Table 4. Value added in agriculture, 1861-1913: intermediate series

Panel A: Value and value added series (million lire)

	(1) Federico 1911-price value added, w/ harvests	(2) Vitali investment in on-farm improvements at current prices	(3) Vitali investment in on-farm improvements at 1938 prices	(4) 1911-price value added in on-farm improvements
1861	4,396	34	189	17
1862	4,595	34	193	35
1863	4,641	31	196	35
1864	4,624	31	201	52
1865	5,063	30	205	0
1866	5,283	35	212	17
1867	4,750	36	194	0
1868	5,028	40	199	17
1869	5,214	40	205	35
1870	5,500	36	210	35
1871	5,380	40	211	17
1872	5,151	46	221	17
1873	5,180	51	232	70
1874	5,590	60	276	87
1875	5,589	132	690	105
1876	5,212	163	877	122
1877	5,272	214	1,014	122
1878	5,669	234	1,148	192
1879	5,696	234	1,224	157
1880	5,949	219	1,135	157
1881	5,712	163	905	140
1882	6,222	138	744	157
1883	6,103	102	588	105
1884	5,723	71	429	140
1885	5,854	56	321	122
1886	6,372	51	290	157
1887	6,289	41	249	35
1888	6,130	36	214	0
1889	5,555	31	173	0
1890	6,250	31	169	87
1891	6,751	33	185	105
1892	6,374	39	231	122
1893	6,827	39	247	70
1894	6,553	61	402	35
1895	6,697	61	381	105
1896	6,931	61	378	122
1897	6,476	66	419	105
1898	6,961	71	439	87
1899	6,849	71	428	35
1900	6,750	71	409	105
1901	7,234	71	411	140
1902	6,937	71	425	157
1903	7,256	71	429	87
1904	7,313	71	448	52
1905	7,456	71	430	122
1906	7,445	76	520	140
1907	8,291	87	538	157
1908	7,881	87	538	140
1909	8,201	87	528	105
1910	7,309	66	381	122
1911	7,877	56	310	105
1912	7,975	46	248	175
1913	8,956	31	167	175

Table 4, continued

Panel B: Quantity series: expected production of tree crops

	(1)	(2)	(3)	(4)	(5)	(6)
	expected production			increment over previous peak		
	wine (million hectol.)	citrus fruit (million quintals)	olive oil (million quintals)	wine (million hectol.)	citrus fruit (million quintals)	olive oil (million quintals)
1861	24.0	2.5	1.4			
1862	24.1	2.5	1.4	.1	.0	.0
1863	24.1	2.6	1.5	.0	.1	.1
1864	24.2	2.7	1.5	.1	.1	.0
1865	24.3	2.8	1.6	.1	.1	.1
1866	24.3	2.8	1.6	.0	.0	.0
1867	24.4	2.8	1.6	.1	.0	.0
1868	24.4	2.8	1.6	.0	.0	.0
1869	24.4	2.8	1.7	.0	.0	.1
1870	24.5	2.9	1.7	.1	.1	.0
1871	24.6	2.9	1.8	.1	.0	.1
1872	24.7	2.9	1.7	.1	.0	.0
1873	24.8	2.9	1.7	.1	.0	.0
1874	25.2	2.9	1.7	.4	.0	.0
1875	25.6	3.0	1.8	.4	.1	.0
1876	26.1	3.1	1.8	.5	.1	.0
1877	26.7	3.2	1.8	.6	.1	.0
1878	27.4	3.2	1.8	.7	.0	.0
1879	28.3	3.3	1.9	.9	.1	.1
1880	29.1	3.4	1.9	.8	.1	.0
1881	29.8	3.6	1.9	.7	.2	.0
1882	30.4	3.7	2.0	.6	.1	.1
1883	31.1	3.9	1.9	.7	.2	.0
1884	31.6	4.0	1.9	.5	.1	.0
1885	32.3	4.1	1.8	.7	.1	.0
1886	32.9	4.2	1.9	.6	.1	.0
1887	33.6	4.4	1.9	.7	.2	.0
1888	33.7	4.5	1.9	.1	.1	.0
1889	33.5	4.5	1.9	.0	.0	.0
1890	33.5	4.5	1.9	.0	.0	.0
1891	34.0	4.4	1.9	.5	.0	.0
1892	34.6	4.5	1.9	.6	.0	.0
1893	35.1	4.7	1.9	.5	.2	.0
1894	35.3	4.9	2.0	.2	.2	.0
1895	35.4	5.0	2.0	.1	.1	.0
1896	35.9	5.1	2.0	.5	.1	.0
1897	36.6	5.1	2.0	.7	.0	.0
1898	37.2	5.1	2.0	.6	.0	.0
1899	37.6	5.2	2.0	.4	.1	.0
1900	37.7	5.3	2.0	.1	.1	.0
1901	38.0	5.6	2.0	.3	.3	.0
1902	38.4	6.0	2.0	.4	.4	.0
1903	38.9	6.3	2.1	.5	.3	.1
1904	39.2	6.5	2.1	.3	.2	.0
1905	39.4	6.6	2.1	.2	.1	.0
1906	39.8	6.8	2.2	.4	.2	.1
1907	40.5	6.9	2.2	.7	.1	.0
1908	41.2	7.1	2.2	.7	.2	.0
1909	41.9	7.2	2.1	.7	.1	.0
1910	42.5	7.2	2.1	.6	.0	.0
1911	43.0	7.4	2.2	.5	.2	.0
1912	43.5	7.5	2.2	.5	.1	.0
1913	44.2	7.8	2.2	.7	.3	.0

Source: see text.

Table 5. Value added in services, 1861-1913: transportation and communication
(million lire at 1911 prices)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	rail transportation				other	mari-	com-
	rail-	tramways			inland	time	muni-
	ways	machine	horse	total	transp.	transp.	cation
1861	10.8	.0	.0	10.8	88.7	13.8	8.3
1862	12.4	.0	.0	12.4	96.5	14.8	10.3
1863	15.1	.0	.0	15.1	99.7	15.9	11.9
1864	17.2	.0	.0	17.2	102.4	16.9	11.9
1865	19.0	.0	.0	19.0	104.5	18.4	12.1
1866	22.2	.0	.0	22.2	95.3	19.9	12.8
1867	22.8	.0	.0	22.8	91.9	21.2	13.5
1868	26.1	.0	.0	26.1	91.5	22.6	13.7
1869	29.4	.0	.0	29.4	92.7	24.2	15.0
1870	33.8	.0	.0	33.8	96.1	26.2	15.2
1871	38.0	.0	.0	38.0	98.6	27.9	18.0
1872	43.9	.0	.0	43.9	104.6	28.5	18.2
1873	49.9	.0	.0	49.9	113.3	29.2	18.4
1874	50.6	.0	.1	50.7	117.8	30.2	16.9
1875	53.4	.0	.2	53.6	108.3	31.2	18.8
1876	58.5	0.1	.4	59.0	108.3	32.4	20.6
1877	60.0	0.1	.6	60.7	110.5	32.8	24.7
1878	60.4	0.1	.8	61.3	113.7	32.7	26.3
1879	64.2	0.6	1.0	65.8	119.0	32.7	24.1
1880	70.8	1.8	1.2	73.8	121.0	32.8	25.2
1881	73.6	3.5	1.4	78.5	125.1	33.6	28.5
1882	78.3	5.4	1.6	85.3	135.9	34.8	30.2
1883	86.7	7.0	1.9	95.6	142.2	35.9	32.2
1884	93.9	8.1	2.1	104.1	146.2	37.1	33.4
1885	96.8	8.8	2.4	108.0	154.1	37.8	34.9
1886	101.8	9.5	2.6	113.9	159.1	38.6	36.2
1887	108.5	10.2	2.9	121.6	159.9	39.8	30.0
1888	120.0	10.5	3.1	133.6	153.0	40.4	31.3
1889	125.9	11.0	3.4	140.3	154.8	40.8	32.0
1890	128.5	12.1	3.6	144.2	154.9	40.7	32.7
1891	127.7	12.9	3.9	144.5	153.0	41.4	34.3
1892	130.5	13.2	4.1	147.8	151.2	42.0	36.8
1893	137.3	13.9	4.3	155.5	151.0	42.0	39.3
1894	142.0	14.6	4.5	161.1	150.6	41.9	40.0
1895	143.9	15.1	4.7	163.7	145.8	42.4	42.3
1896	151.2	15.5	4.8	171.5	145.0	43.8	44.6
1897	160.5	16.5	4.7	181.7	148.8	45.9	48.3
1898	166.1	19.2	4.3	189.6	153.7	48.6	51.1
1899	175.7	22.4	3.7	201.8	158.8	52.6	51.2
1900	182.6	25.4	3.2	211.2	162.6	59.3	55.1
1901	188.8	29.1	2.9	220.8	171.5	66.7	60.8
1902	202.9	32.0	2.6	237.5	183.9	71.4	65.7
1903	214.4	33.3	2.4	250.1	193.1	73.8	73.7
1904	230.1	34.3	2.2	266.6	198.6	74.7	75.7
1905	235.5	36.3	1.8	273.6	213.0	75.6	72.4
1906	262.2	39.5	1.6	303.3	226.3	78.3	75.5
1907	265.0	43.8	1.3	310.1	236.1	82.0	83.4
1908	288.4	47.6	1.0	337.0	250.5	86.5	88.8
1909	308.2	52.3	.8	361.3	277.6	93.0	96.3
1910	334.3	56.3	.6	391.2	302.1	99.8	105.6
1911	355.3	60.8	.4	416.5	313.0	103.7	124.0
1912	375.8	68.2	.3	444.3	326.8	108.8	125.8
1913	401.7	75.3	.0	477.0	329.3	119.7	129.3

Source: see text.

Table 6. Products using contract road haulage, 1861-1913 (million tons)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	agri-	industry							
	culture	extrac.	food	tobacco	textil.	apparel	leather	wood	metal
1861	10.355	14.555	4.015	.015	.303	.010	.025	.877	.094
1862	10.704	16.553	4.009	.015	.304	.010	.025	.744	.088
1863	10.883	17.244	4.029	.015	.319	.010	.026	.716	.073
1864	11.250	17.419	4.045	.015	.320	.010	.026	.716	.071
1865	11.754	17.785	4.052	.015	.316	.011	.027	.880	.064
1866	11.853	15.383	4.067	.015	.308	.010	.028	.956	.069
1867	11.826	14.703	4.083	.015	.307	.011	.028	.903	.070
1868	11.772	14.636	4.098	.015	.303	.010	.030	.741	.070
1869	12.361	14.663	4.132	.014	.308	.011	.029	.768	.074
1870	12.637	15.324	4.162	.015	.313	.011	.030	.822	.079
1871	12.587	15.959	4.212	.016	.324	.011	.031	.769	.072
1872	12.336	17.499	4.246	.017	.324	.012	.031	.799	.093
1873	12.501	19.941	4.285	.017	.340	.012	.030	.800	.086
1874	12.845	20.499	4.319	.018	.340	.012	.030	.774	.107
1875	12.870	17.725	4.334	.016	.328	.013	.031	.799	.105
1876	12.620	17.793	4.337	.018	.315	.013	.031	.880	.097
1877	12.683	18.401	4.347	.018	.328	.013	.032	.880	.098
1878	13.063	18.890	4.384	.017	.337	.014	.032	.880	.088
1879	13.595	19.528	4.386	.016	.334	.013	.032	.797	.129
1880	13.629	20.584	4.455	.016	.343	.014	.034	.771	.138
1881	14.042	21.296	4.547	.015	.347	.016	.034	.853	.168
1882	14.163	24.120	4.573	.015	.345	.015	.034	.881	.172
1883	14.171	25.451	4.627	.015	.365	.015	.035	.883	.206
1884	13.882	26.046	4.682	.018	.360	.016	.036	.964	.219
1885	14.094	27.196	4.748	.018	.381	.017	.038	1.074	.238
1886	14.538	27.809	4.809	.018	.389	.018	.039	1.237	.266
1887	14.755	27.129	4.870	.017	.407	.018	.039	1.290	.312
1888	14.113	27.266	4.932	.017	.414	.018	.039	1.153	.332
1889	14.083	26.925	4.955	.016	.406	.017	.039	.991	.339
1890	14.570	27.123	5.020	.017	.418	.018	.040	.993	.309
1891	15.213	27.054	5.044	.016	.411	.017	.040	.991	.264
1892	15.666	26.012	5.049	.016	.396	.017	.039	.964	.233
1893	15.511	25.963	5.091	.016	.417	.018	.039	.964	.246
1894	15.764	25.614	5.175	.016	.434	.018	.040	.990	.250
1895	15.846	23.448	5.272	.016	.460	.020	.041	1.017	.287
1896	15.786	23.533	5.316	.016	.472	.020	.041	1.097	.283
1897	15.993	24.605	5.367	.015	.481	.020	.040	1.152	.299
1898	15.929	25.012	5.432	.016	.504	.020	.040	1.259	.341
1899	16.144	26.233	5.558	.016	.517	.022	.041	1.367	.395
1900	16.358	27.102	5.666	.016	.500	.022	.041	1.315	.416
1901	16.427	28.815	5.769	.016	.514	.023	.042	1.396	.384
1902	16.824	31.219	5.903	.016	.547	.024	.042	1.452	.383
1903	16.886	33.432	6.052	.017	.548	.025	.042	1.534	.443
1904	17.294	34.996	6.066	.017	.581	.025	.042	1.564	.519
1905	17.442	37.817	6.238	.018	.587	.025	.043	1.701	.628
1906	18.210	39.692	6.510	.018	.627	.028	.044	1.757	.740
1907	18.544	41.293	6.813	.018	.692	.032	.045	1.867	.753
1908	19.138	44.031	6.998	.019	.711	.030	.045	2.032	.912
1909	18.367	50.405	6.971	.020	.715	.032	.046	2.198	1.051
1910	18.363	57.099	7.158	.020	.698	.032	.046	2.258	1.196
1911	18.186	59.965	7.171	.021	.708	.032	.046	2.180	1.187
1912	19.479	61.886	7.537	.021	.775	.034	.046	2.073	1.347
1913	21.097	61.789	7.827	.019	.783	.033	.045	2.046	1.292

Table 6, continued

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	industry (cont.)								
	engi-neer'g	non-met. min. pr.	chem., rubber	paper, printing	sundry mfg.	constr., utilities	total	imports	total
1861	.074	9.138	.128	.071	.002	.000	29.307	3.507	43.169
1862	.072	10.678	.130	.073	.002	.000	32.703	3.544	46.951
1863	.070	11.111	.134	.075	.002	.000	33.824	3.833	48.540
1864	.067	11.261	.139	.079	.002	.000	34.170	4.387	49.807
1865	.065	11.581	.143	.084	.002	.000	35.025	4.081	50.860
1866	.061	9.506	.147	.086	.002	.000	30.638	3.879	46.370
1867	.065	8.890	.154	.089	.002	.000	29.320	3.559	44.705
1868	.070	8.811	.164	.094	.002	.000	29.044	3.688	44.504
1869	.075	8.829	.178	.097	.002	.000	29.180	3.548	45.089
1870	.081	9.326	.190	.102	.002	.000	30.457	3.678	46.772
1871	.078	9.710	.200	.105	.002	.000	31.489	3.929	48.005
1872	.081	10.618	.211	.111	.002	.000	34.044	4.502	50.882
1873	.080	12.190	.226	.112	.002	.000	38.121	4.504	55.126
1874	.086	12.718	.250	.118	.002	.000	39.273	5.226	57.344
1875	.095	10.878	.263	.124	.002	.000	34.713	5.127	52.710
1876	.092	10.476	.292	.128	.002	.000	34.474	5.618	52.712
1877	.093	11.047	.325	.133	.002	.000	35.717	5.381	53.781
1878	.088	11.153	.357	.139	.002	.000	36.381	5.878	55.322
1879	.094	11.155	.385	.145	.002	.000	37.016	7.282	57.893
1880	.111	12.030	.417	.151	.002	.000	39.066	6.207	58.902
1881	.131	12.479	.468	.158	.002	.000	40.514	6.346	60.902
1882	.152	14.315	.506	.167	.002	.000	45.297	6.663	66.123
1883	.171	15.332	.566	.172	.002	.000	47.840	7.175	69.186
1884	.191	16.068	.637	.173	.002	.000	49.412	7.831	71.125
1885	.203	16.698	.717	.181	.002	.000	51.511	9.387	74.992
1886	.228	17.322	.780	.190	.002	.000	53.107	9.796	77.441
1887	.267	17.051	.866	.200	.002	.000	52.468	10.602	77.825
1888	.284	16.944	.914	.212	.002	.000	52.527	7.797	74.437
1889	.274	16.569	.916	.217	.003	.000	51.667	9.589	75.339
1890	.241	16.558	.997	.226	.003	.000	51.963	8.858	75.391
1891	.198	16.214	1.134	.238	.003	.000	51.624	7.600	74.437
1892	.167	15.197	1.159	.249	.003	.000	49.501	8.419	73.586
1893	.160	15.058	1.103	.261	.003	.000	49.339	8.628	73.478
1894	.168	14.940	1.114	.270	.003	.000	49.032	8.483	73.279
1895	.176	13.446	1.145	.282	.003	.000	45.613	9.481	70.940
1896	.179	13.181	1.147	.291	.003	.000	45.579	9.204	70.569
1897	.178	13.376	1.339	.299	.003	.000	47.174	9.220	72.387
1898	.188	13.468	1.481	.304	.003	.000	48.068	10.811	74.808
1899	.214	13.925	1.586	.312	.003	.000	50.189	10.953	77.286
1900	.238	14.584	1.947	.318	.003	.000	52.168	10.578	79.104
1901	.227	15.658	1.992	.322	.003	.000	55.161	11.879	83.467
1902	.218	17.475	1.976	.333	.004	.000	59.592	13.066	89.482
1903	.229	18.884	2.114	.336	.004	.000	63.660	13.418	93.964
1904	.259	20.040	2.371	.383	.004	.000	66.867	12.496	96.657
1905	.306	21.913	2.423	.448	.004	.000	72.151	14.038	103.631
1906	.384	23.463	2.549	.513	.005	.000	76.330	15.600	110.140
1907	.452	24.916	2.688	.523	.005	.000	80.097	16.268	114.909
1908	.515	26.848	3.032	.553	.005	.000	85.731	17.032	121.901
1909	.569	31.584	3.328	.584	.005	.000	97.508	19.195	135.070
1910	.611	36.417	3.601	.605	.006	.000	109.747	18.891	147.001
1911	.627	38.630	3.356	.584	.006	.000	114.513	19.617	152.316
1912	.644	39.804	3.617	.645	.006	.000	118.435	21.129	159.043
1913	.636	39.597	3.602	.655	.006	.000	118.330	20.832	160.259

Source: see text.

Table 7. Annual additions to merchants' inventories, 1861-1913
(million lire at 1911 prices)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		products acquired by merchants								
	total	agricul-tural	extrac-tive	food	tobacco	textiles	apparel	leather	wood	metal
1861	3,959	2,550	59	230	20	122	22	104	78	10
1862	4,117	2,665	64	230	20	118	23	105	66	9
1863	4,218	2,692	68	231	20	121	23	107	64	7
1864	4,284	2,682	68	233	20	119	23	109	64	7
1865	4,520	2,937	70	234	20	114	25	114	78	6
1866	4,582	3,064	66	235	20	117	23	116	85	7
1867	4,231	2,755	66	236	20	117	25	117	80	7
1868	4,391	2,916	67	238	20	118	24	123	66	7
1869	4,535	3,024	66	240	19	125	25	123	68	8
1870	4,718	3,190	68	243	20	128	25	124	73	8
1871	4,709	3,120	68	246	21	140	26	127	68	8
1872	4,691	2,988	74	248	23	140	27	125	71	9
1873	4,708	3,004	84	251	23	147	29	122	71	8
1874	5,048	3,242	83	254	24	149	29	122	69	10
1875	5,058	3,242	74	255	22	149	29	127	71	10
1876	4,882	3,023	79	256	24	138	31	130	78	10
1877	4,900	3,058	80	257	25	135	32	134	78	10
1878	5,241	3,288	85	259	22	143	33	134	78	9
1879	5,456	3,304	93	260	21	140	32	134	71	13
1880	5,509	3,450	95	264	22	151	34	141	68	14
1881	5,517	3,313	99	270	21	166	38	142	76	16
1882	5,846	3,609	109	272	20	166	36	143	78	17
1883	5,950	3,540	114	276	21	175	35	146	78	21
1884	5,875	3,319	112	280	24	177	38	151	86	22
1885	6,201	3,395	115	284	24	185	40	158	95	24
1886	6,632	3,696	114	289	24	192	43	163	110	27
1887	6,812	3,648	112	292	23	203	44	164	114	31
1888	6,200	3,555	115	297	23	220	42	163	102	34
1889	6,074	3,222	114	299	22	221	41	162	88	34
1890	6,352	3,625	114	303	22	229	43	165	88	31
1891	6,475	3,916	114	305	21	228	42	165	88	28
1892	6,322	3,697	115	307	22	224	42	162	86	25
1893	6,626	3,960	111	311	22	229	46	161	86	27
1894	6,430	3,801	108	318	22	252	46	164	88	28
1895	6,676	3,884	100	325	22	267	50	168	90	32
1896	6,794	4,020	102	330	21	273	52	170	97	32
1897	6,567	3,756	112	335	21	279	51	164	102	34
1898	7,096	4,037	115	341	21	293	52	167	112	37
1899	7,144	3,972	125	350	21	310	57	168	121	43
1900	7,114	3,915	128	359	22	308	58	172	117	45
1901	7,585	4,196	136	367	22	324	58	174	124	42
1902	7,620	4,023	140	377	22	339	61	173	129	42
1903	7,945	4,208	149	389	23	343	64	175	136	46
1904	8,006	4,242	152	392	23	358	65	175	139	53
1905	8,437	4,324	160	405	24	371	66	178	151	63
1906	8,844	4,318	167	425	24	402	75	182	156	74
1907	9,585	4,809	167	447	25	442	84	189	166	77
1908	9,642	4,571	173	461	26	450	80	191	180	92
1909	10,259	4,757	183	462	27	450	85	192	195	100
1910	9,973	4,239	198	477	28	433	86	195	205	109
1911	10,428	4,569	204	480	28	428	85	196	193	111
1912	10,847	4,626	212	507	29	475	90	198	184	125
1913	11,394	5,194	212	529	26	475	87	196	181	116

Table 7, continued

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	eng'g products not acquired by merchants					products acquired by merchants				
	ships	rolling stock	other mach.	precis. equip.	fabric. metal	engi-neer'g	other mfg.	industry total	trans-port'n	imports
1861	25	4	6	4	134	32	103	780	96	533
1862	28	8	6	4	135	30	111	776	105	571
1863	32	8	6	4	135	30	111	782	110	634
1864	34	7	5	5	136	29	115	787	114	701
1865	37	9	6	5	137	26	118	805	117	661
1866	37	10	6	6	138	23	111	803	110	605
1867	40	8	6	6	139	25	110	803	107	566
1868	43	9	6	6	140	29	111	803	108	564
1869	43	10	7	6	142	31	115	820	112	579
1870	40	10	8	6	143	34	119	842	118	568
1871	34	11	8	7	144	33	123	860	123	606
1872	33	13	11	7	145	31	131	879	133	691
1873	42	14	13	7	145	26	140	901	146	657
1874	51	14	14	7	146	25	147	912	151	743
1875	47	15	13	7	148	31	140	908	143	765
1876	42	16	13	8	149	29	143	918	146	795
1877	39	16	13	8	150	30	148	929	150	763
1878	35	16	14	8	151	27	151	941	153	859
1879	34	18	15	8	152	29	156	949	161	1,042
1880	31	25	18	9	154	33	163	985	167	907
1881	34	31	21	9	156	37	175	1,040	174	990
1882	41	33	26	9	158	38	186	1,065	188	984
1883	42	33	29	10	159	43	196	1,105	200	1,105
1884	49	32	31	10	161	47	204	1,141	209	1,206
1885	53	35	34	10	163	47	213	1,185	219	1,402
1886	60	40	36	11	165	54	221	1,237	228	1,471
1887	59	49	40	12	168	65	225	1,273	233	1,658
1888	51	59	44	12	169	73	229	1,298	234	1,113
1889	51	54	47	13	170	71	233	1,285	239	1,328
1890	57	44	48	13	170	60	242	1,297	241	1,189
1891	56	37	46	13	170	49	248	1,288	239	1,032
1892	52	37	44	13	170	40	251	1,274	239	1,112
1893	53	37	44	13	170	40	256	1,289	244	1,133
1894	55	40	49	13	172	36	262	1,324	247	1,058
1895	59	42	54	13	173	36	265	1,355	243	1,194
1896	66	44	59	13	174	33	270	1,380	247	1,147
1897	73	51	63	13	176	25	279	1,402	257	1,152
1898	76	60	66	13	177	29	285	1,452	266	1,341
1899	98	68	75	13	179	25	298	1,518	279	1,375
1900	103	74	84	13	181	30	308	1,547	288	1,364
1901	88	75	81	13	182	35	320	1,602	301	1,486
1902	94	76	78	13	184	26	343	1,652	324	1,621
1903	95	81	83	12	185	26	363	1,714	341	1,682
1904	86	85	94	12	188	43	402	1,802	357	1,605
1905	101	94	110	12	190	48	447	1,913	375	1,825
1906	108	118	136	12	194	57	497	2,059	407	2,060
1907	108	139	155	12	197	72	524	2,193	419	2,164
1908	94	151	173	12	201	96	563	2,312	450	2,309
1909	84	142	185	12	204	126	614	2,434	491	2,577
1910	100	141	197	12	207	129	668	2,528	533	2,673
1911	125	160	202	13	210	117	689	2,531	559	2,769
1912	168	171	205	13	213	103	745	2,668	588	2,965
1913	170	169	202	13	216	101	757	2,680	609	2,911

Source: see text.

Table 8. Imports not acquired by merchants, 1861-1913 (million lire at 1911 prices)

	(1) textile fibers	(2) tobacco leaf	(3) coal	(4) tobacco products	(5) textile semi-mfs	(6) engin'ing products	(7) total
1861	25	19	4	2	35	8	93
1862	11	14	5	9	19	9	67
1863	9	6	6	10	14	12	57
1864	5	7	6	15	12	10	55
1865	6	12	7	12	21	11	69
1866	12	16	8	21	22	9	88
1867	21	19	8	1	25	9	83
1868	25	16	9	2	26	8	86
1869	28	13	10	6	30	12	99
1870	27	14	11	3	24	9	88
1871	24	19	12	4	26	14	99
1872	28	20	13	5	23	19	108
1873	46	22	15	6	33	29	151
1874	50	27	16	4	32	21	150
1875	38	30	16	7	37	13	141
1876	45	34	17	10	43	13	162
1877	53	31	17	0	40	14	155
1878	50	25	17	0	27	11	130
1879	55	25	17	0	24	11	132
1880	64	28	19	0	23	19	153
1881	69	26	20	1	41	27	184
1882	102	36	21	2	35	37	233
1883	96	16	23	1	37	42	215
1884	97	22	25	1	35	45	225
1885	125	25	26	2	37	44	259
1886	108	39	28	2	30	46	253
1887	131	27	31	2	26	51	268
1888	126	24	34	2	24	50	260
1889	148	24	36	3	28	54	293
1890	169	22	38	4	28	33	294
1891	150	23	39	3	26	19	260
1892	157	23	39	3	25	18	265
1893	167	23	41	2	26	16	275
1894	209	19	42	2	26	18	316
1895	208	27	43	1	30	24	333
1896	218	24	45	2	27	23	339
1897	233	26	46	3	24	22	354
1898	259	19	49	2	22	22	373
1899	252	21	52	2	30	39	396
1900	233	29	55	1	28	66	412
1901	265	35	59	1	34	57	451
1902	286	31	63	1	45	42	468
1903	293	31	67	1	37	47	476
1904	298	25	72	1	38	61	495
1905	314	21	77	1	36	65	514
1906	352	35	83	1	36	116	623
1907	424	33	92	1	41	174	765
1908	403	34	99	1	47	169	753
1909	376	38	109	1	47	111	682
1910	353	32	117	1	44	99	646
1911	387	33	120	1	39	95	675
1912	429	37	124	1	37	85	713
1913	414	43	128	1	35	85	706

Source: see text.

Table 9. Urban population, residential rooms, and room rents

Panel A: All cities over 35,000 in the urban center: population, rooms, and rents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1911 census data						Giusti sample	
	urban center			residual area			lire/room, 1908	
municipality	persons present	rooms ex offices total	rooms ex offices empty	persons present	rooms ex offices total	rooms ex offices empty	bourgeois	working class
Naples	621,563	397,970	8,770	56,468	6,769	840	280	237
Milan	579,385	435,257	10,741	19,815	9,151	599	167	115
Rome	504,566	355,524	10,452	37,557	14,644	729	230	171
Turin	357,473	261,487	6,599	69,633	71,056	9,191	180	109
Palermo	*279,597*	*232,354*	*13,794*	*61,491*	*52,727*	*9,915*	*174*	*122*
Florence	207,584	211,557	7,143	25,276	21,735	1,564	91	59
Catania	*203,906*	*129,896*	*6,964*	*6,797*	*19,171*	*3,149*	*154*	*107*
Genoa	173,270	277,425	11,484	98,951	1,745	167	152	120
Venice	151,485	126,918	3,454	9,234	2,420	0	157	118
Bologna	132,673	120,340	2,798	39,955	27,276	581	93	68
Bari	95,574	49,051	7,254	8,096	3,608	161	207	103
Leghorn	89,908	78,461	1,249	15,407	14,687	419	75	50
Foggia	*71,632*	*30,657*	*0*	*5,048*	*922*	*0*	*83*	*59*
Messina	*63,545*	*31,965*	*242*	*63,012*	*32,447*	*123*	*106*	*88*
Verona	62,179	51,285	1,088	19,730	14,686	707	91	46
Cagliari	55,765	36,272	546	4,336	1,908	12	92	64
Brescia	55,608	44,711	737	27,730	18,767	581	106	71
Taranto	*55,292*	*29,681*	*554*	*13,986*	*7,768*	*1,155*	*109*	*86*
Padua	52,099	46,738	1,732	44,131	21,492	1,490	156	89
Parma	51,122	38,846	3,113	788	3,267	212	81	42
Andria	50,591	28,690	1,282	2,693	1,260	0	67	73
Modica	*50,540*	*21,645*	*3,156*	*5,384*	*1,767*	*321*	*169*	*86*
Ancona	50,269	41,614	462	12,831	7,048	44	90	85
Trapani	*47,500*	*40,526*	*6,540*	*12,093*	*11,762*	*2,569*	*173*	*81*
Corato	*44,745*	*14,105*	*978*	*458*	*380*	*254*	*110*	*54*
Molfetta	*42,843*	*17,425*	*164*	*420*	*111*	*0*	*96*	*75*
Bergamo	42,715	37,711	511	12,591	3,834	159	104	55
Barletta	*41,397*	*16,694*	*503*	*2,904*	*800*	*31*	*105*	*75*
Modena	*40,526*	*34,632*	*606*	*30,397*	*19,112*	*1,444*	*84*	*53*
Ferrara	39,768	28,917	365	55,444	35,342	151	130	65
Cremona	39,506	29,515	1,580	930	7,706	314	76	50
S. Pier d'Arena	38,871	39,075	1,460	3,550	3,083	118	106	70
Novara	38,669	26,620	275	15,902	5,843	623	107	57
Vicenza	38,366	25,014	595	16,189	14,095	253	89	61
Piacenza	*38,178*	*28,735*	*862*	*364*	*174*	*4*	*99*	*66*
Alessandria	38,067	28,180	353	37,654	28,224	2,356	103	55
La Spezia	37,297	35,209	1,122	36,302	20,663	1,191	139	130
Savona	36,980	39,468	1,569	13,189	12,449	836	89	70
Como	35,390	11,405	261	8,742	24,628	1,161	94	73
Sassari	35,042	27,446	1,180	8,076	3,275	333	104	66

Table 9, continued

Panel B: Other cities in the Giusti sample: population, rooms, and rents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1911 census data						Giusti sample	
	urban center			residual area			lire/room, 1908	
municipality	persons present	rooms ex offices total	rooms ex offices empty	persons present	rooms ex offices total	rooms ex offices empty	bourgeois	working class
Monza	34,466	22,917	198	18,748	8,624	109	95	73
Pavia	34,316	24,531	1,263	5,582	7,164	337	76	55
Ragusa	33,717	4,685	1,730	3,826	2,267	1,071	89	62
Mantova	31,957	25,425	634	700	186	0	84	70
Caltagirone	30,459	20,390	5,046	12,106	7,731	4,384	39	32
Siena	30,311	31,257	559	11,362	9,288	102	65	29
Caltanissetta	29,495	16,268	2,139	11,817	5,240	1,885	111	49
Pisa	29,237	28,244	718	35,995	29,007	1,303	80	50
Chioggia	28,927	16,730	380	6,134	7,913	129	97	61
Marsala	27,337	35,161	8,904	38,114	89,336	30,509	50	26
Treviso	25,271	23,138	1,558	15,751	10,969	1,100	128	48
Castrogiovanni	24,606	15,236	357	3,706	4,755	2,362	56	28
Vercelli	24,447	13,127	176	7,456	6,731	318	81	52
Asti	23,273	19,794	683	16,420	12,105	1,417	119	54
Brindisi	22,616	11,043	83	5,570	1,647	57	103	88
Ravenna	22,442	16,279	290	49,139	27,758	693	113	60
Terni	22,097	15,069	72	10,842	6,040	252	104	65
Perugia	22,027	20,683	503	43,778	28,956	1,542	56	71
Sestri Ponente	21,464	20,407	302	0	0	0	78	62
Lucca	21,213	26,197	1,462	54,947	61,756	7,198	57	37
Reggio Emilia	20,727	18,744	420	49,692	28,559	852	89	48
Faenza	20,177	30,256	930	19,987	13,491	815	74	43
Rimini	19,996	21,263	4,745	30,856	24,309	6,376	85	34
Prato	18,207	14,886	281	38,502	29,921	0	66	46
Busto Arsizio	17,130	12,461	142	8,499	4,813	98	104	47
Viterbo	16,982	13,817	484	6,317	4,525	446	52	36
Pesaro	16,217	14,072	264	11,131	7,310	227	197	78
Biella	16,147	13,243	96	6,372	4,140	102	102	67
Viareggio	15,477	18,120	1,924	5,651	5,432	696	81	43
Cesena	14,913	9,706	73	30,686	17,806	112	70	30
Cuneo	14,545	13,436	1,165	12,925	17,904	11,519	80	47
Arezzo	14,486	12,722	204	33,018	23,188	1,810	63	44
Imola	14,370	9,823	98	20,611	11,445	132	52	40
Civitavecchia	14,265	9,328	48	4,471	1,069	49	117	99
Pinerolo	14,005	12,071	502	5,320	3,577	447	89	54
Lecco	11,848	3,818	87	298	840	40	92	60
Spoleto	8,416	6,992	428	17,580	9,049	1,555	67	39
Grosseto	6,280	3,801	29	6,162	3,141	4	110	96

Table 9, continued

Panel C: All urban centers over 35,000: rent-related variables, 1911

municipality	(1) persons present total (000)	(2) persons present 1911/1901	(3) persons present per room	(4) empty rooms (share)	(5) regional index	(6) topogr. const't index
Naples	621.563	1.262	1.562	.0220	11	5.0
Milan	579.385	1.249	1.331	.0247	3	0.0
Rome	504.566	1.188	1.419	.0294	9	1.0
Turin	357.473	1.264	1.367	.0252	1	3.5
Palermo	*279.597*	*1.049*	*1.203*	*.0594*	*15*	*5.0*
Florence	207.584	1.310	.981	.0338	6	1.0
Catania	*203.906*	*1.424*	*1.570*	*.0536*	*15*	*5.0*
Genoa	173.270	1.088	.625	.0414	2	7.0
Venice	151.485	1.041	1.194	.0272	4	10.0
Bologna	132.673	1.066	1.102	.0233	5	3.0
Bari	95.574	1.321	1.948	.1479	12	5.0
Leghorn	89.908	1.056	1.146	.0159	6	5.0
Foggia	*71.632*	*1.464*	*2.337*	*.0000*	*12*	*0.0*
Messina	*63.545*	*.688*	*1.988*	*.0076*	*15*	*7.0*
Verona	62.179	1.002	1.212	.0212	4	2.0
Cagliari	55.765	1.146	1.537	.0151	16	7.0
Brescia	55.608	1.157	1.244	.0165	3	1.0
Taranto	*55.292*	*1.156*	*1.863*	*.0187*	*12*	*7.0*
Padua	52.099	1.011	1.115	.0371	4	0.0
Parma	51.122	1.077	1.316	.0801	5	0.0
Andria	50.591	1.041	1.763	.0447	12	0.0
Modica	*50.540*	*1.063*	*2.335*	*.1458*	*15*	*7.0*
Ancona	50.269	1.472	1.208	.0111	7	7.0
Trapani	*47.500*	*1.075*	*1.172*	*.1614*	*15*	*6.0*
Corato	*44.745*	*1.094*	*3.172*	*.0693*	*12*	*0.0*
Molfetta	*42.843*	*1.075*	*2.459*	*.0094*	*12*	*5.0*
Bergamo	42.715	1.025	1.133	.0136	3	2.5
Barletta	*41.397*	*1.025*	*2.480*	*.0301*	*12*	*5.0*
Modena	*40.526*	*1.425*	*1.170*	*.0175*	*5*	*0.0*
Ferrara	39.768	1.110	1.375	.0126	5	0.0
Cremona	39.506	1.070	1.339	.0535	3	0.0
S. Pier d'Arena	38.871	1.158	.995	.0374	2	7.0
Novara	38.669	1.306	1.453	.0103	1	0.0
Vicenza	38.366	1.278	1.534	.0238	4	3.0
Piacenza	*38.178*	*1.062*	*1.329*	*.0300*	*5*	*3.0*
Alessandria	38.067	1.059	1.351	.0125	1	2.0
La Spezia	37.297	.974	1.059	.0319	2	7.0
Savona	36.980	1.258	.937	.0398	2	7.0
Como	35.390	1.104	3.103	.0229	3	1.0
Sassari	35.042	1.070	1.277	.0430	16	0.0

Table 9, continued

Panel D: Regression results, bourgeois-housing rents

Dependent variable: bourgeois-housing rents (panel A, col. 7)

Coefficients and *t*-statistics:

specification	(1) constant	(2) persons present: total	(3) persons present: 1911/1901	(4) persons present: per room	(5) empty rooms (share)	(6) regional index	(7) topogr. const't index	(8) adj'd R sq'd
(1)	89.8	.249	−34.8	11.0	483.6	-.240	3.61	.616
	(1.48)	(6.44)	(−.07)	(.72)	(2.03)	(-.16)	(1.68)	
(2)	66.5	.230			482.1		2.99	.650
	(5.52)	(6.95)			(2.24)		(1.55)	
(3)	75.9	.239			484.4			.630
	(7.09)	(6.73)			(2.19)			
(4)	83.0	.234					3.02	.594
	(8.07)	(6.31)					(1.45)	

Panel E: Regression results, working-class-housing rents

Dependent variable: working-class-housing rents (panel A, col. 8)

Coefficients and *t*-statistics:

specification	(1) constant	(2) persons present: total	(3) persons present: 1911/1901	(4) persons present: per room	(5) empty rooms (share)	(6) regional index	(7) topogr. const't index	(8) adj'd R sq'd
(1)	67.1	.208	−42.7	12.4	95.8	.630	5.11	.678
	(1.46)	(7.09)	(−1.05)	(1.06)	(.53)	(.54)	(3.15)	
(2)	40.2	.200			134.2		4.39	.684
	(4.24)	(7.36)			(.79)		(2.89)	
(3)	54.0	.198			137.5			.591
	(5.80)	(6.41)			(.66)			
(4)	44.8	.198					4.39	.689
	(6.01)	(7.37)					(2.91)	

Table 9, continued

Panel F: All urban centers over 35,000: rent-pool estimates (1911, at 1908 prices)

municipality	(1) domestic servants	(2) bourgeois rooms	(3) working-cl. rooms	(4) rent pool (million lire) bourg.	(5) rent pool (million lire) work'g-cl.	(6) rent pool (million lire) total
Naples	27,563	95,095	302,875	26.627	71.781	98.408
Milan	29,230	103,488	331,769	17.282	38.153	55.435
Rome	24,399	84,794	270,730	19.503	46.295	65.798
Turin	18,781	62,100	199,387	11.178	21.733	32.911
Palermo	8,920	29,217	203,137	5.084	24.783	29.867
Florence	13,379	45,550	166,007	4.145	9.794	13.939
Catania	4,474	15,847	114,049	2.440	12.203	14.643
Genoa	11,283	33,236	244,189	5.052	29.303	34.355
Venice	6,563	22,948	103,970	3.603	12.268	15.871
Bologna	7,195	22,904	97,436	2.130	6.626	8.756
Bari	2,900	10,032	39,019	2.077	4.019	6.096
Leghorn	3,203	10,687	67,774	.802	3.389	4.191
Foggia	891	3,102	27,555	.257	1.626	1.883
Messina	1,399	3,783	28,182	.401	2.480	2.881
Verona	2,696	8,537	42,748	.777	1.966	2.743
Cagliari	2,843	9,866	26,406	.908	1.690	2.598
Brescia	2,785	8,358	36,353	.886	2.581	3.467
Taranto	659	2,133	27,548	.232	2.369	2.601
Padua	3,756	10,421	36,317	1.626	3.232	4.858
Parma	2,799	10,000	28,846	.810	1.212	2.022
Andria	340	1,193	27,497	.080	2.007	2.087
Modica	981	3,362	18,283	.568	1.572	2.140
Ancona	1,261	4,078	37,536	.367	3.191	3.558
Trapani	1,159	3,749	36,777	.649	2.979	3.628
Corato	195	698	13,407	.077	.724	.801
Molfetta	283	1,014	16,411	.097	1.231	1.328
Bergamo	1,960	6,253	31,458	.650	1.730	2.380
Barletta	283	985	15,709	.103	1.178	1.281
Modena	2,275	6,435	28,197	.541	1.494	2.035
Ferrara	2,016	5,144	23,773	.669	1.545	2.214
Cremona	2,136	7,601	21,914	.578	1.096	1.674
S. Pier d'Arena	628	2,166	36,909	.230	2.584	2.814
Novara	1,155	3,552	23,068	.380	1.315	1.695
Vicenza	1,746	5,353	19,661	.476	1.199	1.675
Piacenza	1,288	4,615	24,120	.457	1.592	2.049
Alessandria	1,194	3,230	24,950	.333	1.372	1.705
La Spezia	1,201	3,257	31,952	.453	4.154	4.607
Savona	1,029	3,217	36,251	.286	2.538	2.824
Como	1,739	5,640	5,765	.530	.421	.951
Sassari	1,478	4,823	22,623	.502	1.493	1.995

NB: the domestic servants in col. 1 refer to the entire municipality.

Table 9, continued

Panel G: Distribution of the resident population, by municipality size, census years

Municipality population (1971 borders)	(1) 1861	(2) 1871	(3) 1881	(4) 1901	(5) 1911	(6) Urban share 1911	(7) Urban scale factor
	Distribution of the resident population by municipality size (thousand persons)						
1. over 700,000	0	0	0	0	1,453	.83	.830
2. 600,000 to 699,999	0	0	0	621	0		.800
3. 500,000 to 599,999	0	0	535	528	519	.97	.770
4. 400,000 to 499,999	484	489	0	422	881	.60	.740
5. 300,000 to 399,999	0	0	354	1,017	339	.82	.710
6. 200,000 to 299,999	510	1,395	1,059	237	674	.80	.680
7. 150,000 to 199,999	879	165	362	343	179	.74	.658
8. 100,000 to 149,999	221	231	354	295	470	.66	.643
9. 80,000 to 99,999	178	267	187	453	363	.55	.632
10. 60,000 to 79,999	269	396	605	884	1,123	.54	.626
11. 40,000 to 59,999	777	617	576	849	948	.62	.620
12. under 40,000	22,352	23,742	24,819	27,323	28,892		
13. Total	25,671	27,301	28,861	32,983	35,842		

Panel H: Distribution of the major-city population, by municipality size, census years

Municipality population (1971 borders)	(1) 1861	(2) 1871	(3) 1881	(4) 1901	(5) 1911	(6) Rent/ room 1911
	Distribution of the major-city population by municipality size (thousand persons)					
1. over 700,000	0	0	0	0	1,206	187
2. 600,000 to 699,999	0	0	0	497	0	171
3. 500,000 to 599,999	0	0	412	414	400	151
4. 400,000 to 499,999	358	362	0	312	652	133
5. 300,000 to 399,999	0	0	251	722	241	116
6. 200,000 to 299,999	347	949	720	161	458	100
7. 150,000 to 199,999	578	109	238	226	118	88
8. 100,000 to 149,999	142	149	228	190	302	81
9. 80,000 to 99,999	112	169	118	286	229	77
10. 60,000 to 79,999	168	248	379	553	703	74
11. 40,000 to 59,999	482	383	357	526	588	71
12. under 40,000	23,484	24,932	26,148	29,096	30,945	51
13. Total	25,671	27,301	28,861	32,983	35,842	
14. 1911-price rent index	.899	.904	.915	.955	1.000	

Source: see text.

Table 10. Value added in services, 1861-1913: government

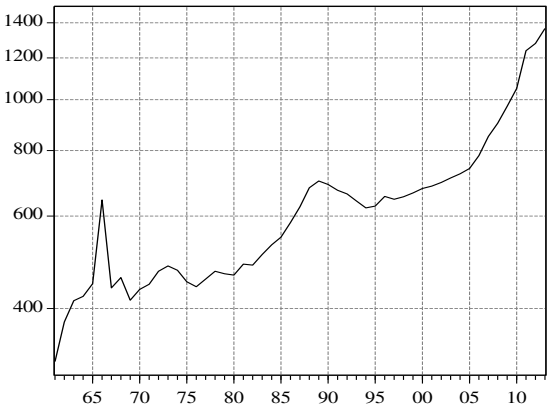
Panel A: Time-series evidence

	(1)	(2)	(3)	(4)	(5)
	Value added at current prices (million lire)	Indices of remuneration (1911 = 1) career State civil service	other civilian employment	military rank & file	Rent index (1911 = 1)
1861	317	.702	.578	.724	.433
1862	377	.702	.580	.712	.437
1863	414	.702	.584	.704	.441
1864	422	.702	.588	.685	.445
1865	446	.702	.593	.696	.449
1866	644	.702	.598	.729	.453
1867	438	.702	.605	.767	.458
1868	458	.702	.609	.758	.463
1869	415	.702	.614	.748	.468
1870	435	.702	.620	.774	.473
1871	445	.718	.627	.844	.482
1872	471	.749	.633	.884	.492
1873	482	.781	.633	.913	.502
1874	473	.796	.634	.870	.513
1875	450	.796	.634	.843	.524
1876	440	.839	.641	.820	.535
1877	455	.881	.646	.852	.546
1878	471	.924	.650	.873	.557
1879	466	.924	.654	.873	.571
1880	463	.948	.657	.856.	586
1881	486	.972	.660	.849	.600
1882	484	.996	.664	.825	.615
1883	507	.996	.668	.802	.631
1884	529	.996	.675	.770	.646
1885	547	.996	.685	.755	.663
1886	583	.996	.703	.754	.679
1887	625	.997	.717	.762	.696
1888	679	1.000	.727	.775	.684
1889	700	1.002	.730	.791	.673
1890	689	1.003	.724	.802	.661
1891	672	1.003	.722	.799	.655
1892	661	1.003	.718	.785	.648
1893	641	.974	.719	.758	.642
1894	622	.914	.716	.750	.635
1895	627	.854	.712	.751	.629
1896	654	.823	.712	.768	.635
1897	646	.823	.722	.773	.641
1898	653	.823	.740	.779	.648
1899	664	.823	.762	.787	.654
1900	677	.823	.780	.796	.661
1901	684	.832	.790	.809	.667
1902	695	.851	.799	.819	.674
1903	709	.869	.817	.823	.681
1904	722	.878	.837	.837	.698
1905	739	.878	.860	.848	.733
1906	782	.878	.881	.866	.784
1907	851	.888	.906	.888	.839
1908	901	.919	.934	.925	.898
1909	971	.959	.956	.950	.943
1910	1,050	.990	.978	.971	.971
1911	1,239	1.000	1.000	1.000	1.000
1912	1,279	1.000	1.021	1.021	1.030
1913	1,366	1.000	1.039	1.036	1.061

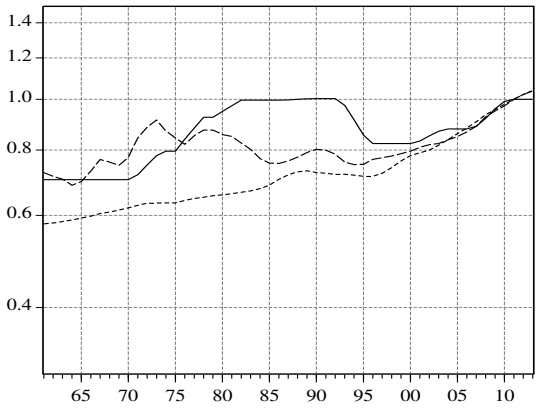
Table 10, continued

Panel B: Time-series graphs

(a) Value added at current prices

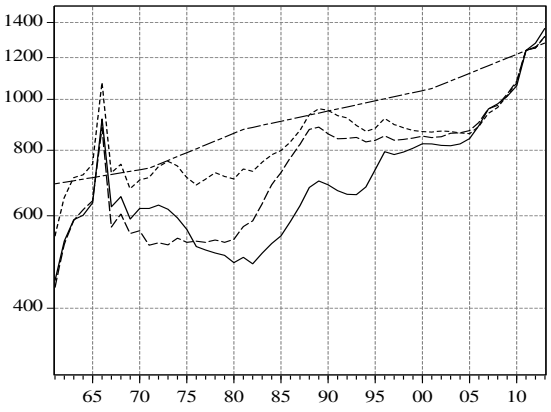


(b) Remuneration indices (1911 = 1)



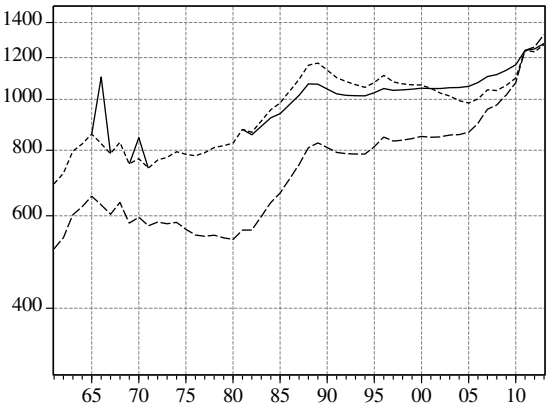
——— State civil servants
------ other civilian public employees
— — — soldiers

(c) Alternative deflations of value added and interpolated census benchmarks



Value added deflated by remuneration index:
——— for State civil servants
------- for other civilian public employees
— — — for soldiers
Census-based series:
— - — - interpolated/extrapolated benchmarks

(d) Interim and final deflated series



— — — initial deflated series (ex 1866 war)
------ idem, forced through benchmarks
——— with final corrections for soldiers

Table 10, continued

Panel C: Census-year benchmark estimates

	(1) 1911	(2) 1901	(3) 1881	(4) 1871	(5) 1861
A. Disaggregated figures (thousands)					
1. Career civil servants	59.9	57.8	61.8	48.3	37.7
2. Schoolteachers	92.3	82.5	67.8	44.7	29.5
3. Other civilian	126.6	123.7	108.8	88.6	72.2
4. Military officers	15.0	15.5	12.9	13.7	14.7
5. Other military	412.0	270.5	169.9	179.4	232.9
B. Totals (thousands)					
6. Vitali (with census military)	537	472	403	333	275
7. Vitali (with actual military)	711	554	426		
8. Broadberry, Giordano, Zollino	318	289	251	188	141
9. New, simple	706	550	421	375	387
10. New, weighted	1,238	1,048	876	739	690
C. Average annual intercensal growth rates (percent)					
11. Vitali (with census military)	1.30	.79	1.93	1.93	
12. Vitali (with actual military)	2.53	1.32			
13. Broadberry, Giordano, Zollino	.96	.71	2.93	2.93	
14. New, simple	2.53	1.35	1.16	-.31	
15. New, weighted	1.68	.90	1.72	.69	
D. Estimated 1911-price value added, by group (million lire)					
16. Career civil servants	233.0	224.8	240.3	187.8	146.6
17. Schoolteachers	207.3	185.3	152.3	100.4	66.3
18. Other civilian	286.5	279.9	246.2	200.5	163.4
19. Military officers	58.3	60.3	50.2	53.3	57.2
20. Other military	453.2	297.6	186.9	197.3	256.2
E. Implied current-price value added, by group (million lire)					
21. Career civil servants	233.0	185.2	229.1	132.7	101.0
22. Schoolteachers	207.3	143.9	99.5	61.3	37.2
23. Other civilian	286.5	226.6	209.8	168.4	93.7
24. Military officers	58.3	49.7	47.8	37.6	39.4
25. Other military	453.2	240.7	158.7	166.6	185.5
26. Total	1,238	846	745	567	457
27. Ratio to panel A, col. 1	1.00	1.24	1.53	1.27	1.44

NB: The figures in Vitali (1970) cover only the years 1911, 1901, and 1881; the corresponding figures for 1871 and 1861 in row 6 are the extrapolated figures in Fenoaltea (2005).

Source: see text.

Table 11. In pursuit of the *ISIC*: transfers from industry to the services (million lire)

	(1) print'g & pub'g	(2) shoe repair	(3) repair of metal fab. met.	(4) cons. durables machin.	(5) precis.	(6) total
1861	12.14	58.54	2.9	.0	3.6	77.18
1862	12.63	58.53	3.0	.0	3.9	78.06
1863	12.63	59.52	3.0	.0	4.1	79.25
1864	13.11	61.39	3.0	.0	4.5	82.00
1865	14.08	64.56	3.0	.0	4.9	86.54
1866	14.57	69.01	3.1	.0	5.1	91.78
1867	15.06	69.58	3.1	.0	5.3	93.04
1868	16.03	71.13	3.2	.0	5.5	95.86
1869	16.51	69.98	3.2	.0	5.8	95.49
1870	17.48	71.22	3.2	.0	6.0	97.90
1871	17.97	70.11	3.2	.0	6.2	97.48
1872	18.94	68.90	3.3	.0	6.4	97.54
1873	18.46	68.30	3.3	.0	6.6	96.66
1874	20.40	68.96	3.3	.0	6.8	99.46
1875	21.37	70.86	3.3	.0	6.9	102.43
1876	22.34	73.12	3.4	.0	7.2	106.06
1877	22.34	74.48	3.4	.0	7.4	107.62
1878	23.80	75.69	3.5	.0	7.6	110.59
1879	24.28	76.67	3.5	.0	7.9	112.35
1880	25.74	78.90	3.6	.0	8.1	116.34
1881	27.20	79.58	3.6	.0	8.4	118.78
1882	28.65	79.76	3.6	.0	8.7	120.71
1883	30.11	80.88	3.7	.0	9.0	123.69
1884	32.05	84.28	3.7	.0	9.4	129.43
1885	34.48	87.79	3.7	.0	9.9	135.87
1886	36.42	90.97	3.8	.0	10.4	141.59
1887	38.37	90.87	3.8	.0	11.0	144.04
1888	39.82	91.79	3.9	.0	11.5	147.01
1889	41.28	92.48	4.0	.0	11.8	149.56
1890	43.71	94.42	4.0	.0	11.9	154.03
1891	45.65	94.15	4.1	.0	12.1	156.00
1892	48.08	92.27	4.1	.1	12.2	156.75
1893	49.54	90.86	4.1	.1	12.3	156.90
1894	51.48	92.07	4.2	.2	12.4	160.35
1895	53.91	93.32	4.2	.3	12.4	164.13
1896	55.85	94.41	4.3	.4	12.3	167.26
1897	57.31	92.43	4.4	.5	12.2	166.84
1898	57.79	92.69	4.4	.6	12.1	167.58
1899	59.74	92.82	4.5	.8	12.1	169.96
1900	60.22	95.39	4.5	1.0	12.1	173.21
1901	61.68	97.28	4.6	1.1	11.9	176.56
1902	64.11	98.07	4.7	1.4	11.7	179.98
1903	65.08	98.51	4.7	1.6	11.6	181.49
1904	75.76	98.69	4.8	2.0	11.6	192.85
1905	89.85	99.55	4.9	2.3	11.5	208.10
1906	104.90	101.09	4.9	2.7	11.4	224.99
1907	108.30	103.42	5.0	3.3	11.3	231.32
1908	114.62	105.10	5.2	3.9	11.3	240.12
1909	121.90	105.46	5.2	4.8	11.2	248.56
1910	127.73	105.07	5.3	6.4	11.1	255.60
1911	125.30	105.57	5.5	8.4	11.1	255.87
1912	139.87	106.33	5.6	10.3	11.1	273.20
1913	141.33	106.63	5.8	12.3	11.1	277.16

Source: see text.