Reconstructing The Past: Italy's Historical National Accounts, 1861-1913

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ITALY'S HISTORICAL NATIONAL ACCOUNTS, 1861-1913

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ABSTRACT

This paper summarizes the evolution of Italy's historical national accounts, and presents an updated reconstruction of the production side, the expenditure side, and the composition of investment from Unification to the Great War. On the production side, the major improvements stem from the recovery of evidence on harvest fluctuations, which increases short-term volatility, and the removal of gross errors in the estimates for the services, which sharply reduces pre-War GDP. The expenditure-side disaggregation reaffirms the Kuznets-cycle path of fixed investment; the cut in GDP yields a cut in consumption, but does not imply a lower standard of living.

Keywords: Italy, production, measurement, historical national accounts

JEL codes: C13, E01, N01

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> Pour remembrer des ancessours
> Les faiz et les diz et les mours,
> Doit l'on les livres et les gestes
> Et les estoires lire as festes,
> Les felonies des felons
> Et les barnages des barons.
> Wace, *Le Roman de Rou*

1. INTRODUCTION

1.1 On method

This paper presents my latest, revised estimates for the Italian economy from Unification to the Great War; it builds on three recent papers revising the estimates of the production side of the historical national accounts, of the expenditure side, and of the composition of investment (Fenoaltea 2017a, 2018a, 2018b). The time series presented there have been further revised: they now incorporate the recently completed estimates for the leather industry (Fenoaltea 2019), some minor improvements, and also a small number of *pentimenti*.[1]

A companion paper deals not with the Italian nitty-gritty, but with method, with what such historical "measurement" actually involves, with how it should be done (Fenoaltea 2020, here brutally summarized). Cliometricians are trained by economists in their own image and likeness, and today's economists are inured to downloading data from official sites: "measurement" is seen as simple "data-gathering," an essentially unskilled activity that can be farmed out to graduate students, an activity that requires far less training, talent, and experience than the subsequent "analysis" and "interpretation."

Nothing, I submit, could be further from the truth. I have devoted much of my working life to "measurement," ill-rewarded as it is, because it is *important* – if we don't get "the facts" right our analyses are not economic history but a low form of fiction – and above all because it is *challenging*, because it requires a breadth of culture, and a panoply of skills, that push me to my limits.[2] The past is *gone*, we cannot observe it, we cannot reconstruct it

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[1] An updated account of the derivation of the estimates presented here can be obtained from the author.

[2] Because it is so challenging, too, it is personally rewarding: my "analysis" may earn the tinsel of professional prizes, but it is tightly constrained by theory and technique, if I got it right somebody else would have too, probably sooner rather than later; my reconstruction of the past is shaped by *my* strengths and weaknesses, it is *mine* as a work of art would be, as a piece of "science" could never be.

wie es eigentlich gewesen ist. All we can do is recreate it as by our lights "it must have been," as it most probably was: we want our reconstruction to sit well with what we can and should know of the sources, of technology, of institutions, of human ("market") behavior, in short with everything we can bring to bear. The closest parallel is the "restoration" of an ancient temple or a medieval cathedral: only a contemporary economist, trained but not educated, could entrust to a graduate student the restoration of Vézeley or Notre Dame, the reconstruction of the past.

The reconstruction of the economy's past performance is an *arte* with its *regole*, which I hold to be self-evident. First, we must vet the sources: we must understand how, by whom, and to what purpose the data they report were generated, we must understand how those data are related to "the facts" they purportedly document. Second, we must disaggregate: to capture changes in an aggregate's composition, above all to obtain the finer-grained evidence that allows us to discriminate among the alternative interpretations that remain consistent with the aggregate alone. Third, we must *think* when we extrapolate: we cannot infer the path of undocumented production from that of documented production without due cognizance of how they likely differed, we must learn to recognize, and utilize, the *indirect* evidence that can usefully constrain our estimates. Fourth, we must derive our estimates of "real value added" by deflating current-price value added by a *common* deflator: activity-specific deflation yields results that are at best distorted, at worst outright nonsense. Fifth and not least, we must measure what we want to measure: in the case at hand the economy's aggregate product, and not "GDP," that hodge-podge *index* of paid-employment-generating production hastily put together to assist anti-cyclical policy.

I derived these rules from my reading of the early historical national accounts for the main European countries, but *a contrario*: quite appallingly, these took the data in the sources at face value, remained content with relative aggregates, automatically attributed the path of documented production to undocumented production, calculated "real value added" through Fabricant-Geary "double deflation," and sought to reconstruct bog-standard "GDP." The corpus of historical national accounts has since exploded, and I cannot claim to have mastered it; but as far as I can tell the pioneers' methodology still holds sway, the self-evident rules recalled above seem curiously not to be evident at all (whence my recurring efforts to make them so, Fenoaltea 1976, 2010, 2020).

1.2 From rules to generations: a taxonomy

The above rules are on different levels. The first three – vet the data, disaggregate, *think* when you extrapolate – inform the construction of our elementary production series, the production-quantity estimates that would have been our "data" had production been properly measured at the time. The fourth – use a common deflator – informs the subsequent transformation of physical-product estimates into "real value added" estimates that can be meaningfully compared and aggregated; and the fifth enjoins us to correct the estimates of "GDP" to obtain a measure of aggregate product.[3]

The varying extent to which these rules are actually heeded generates in turn a natural taxonomy. As noted, the pioneers' historical accounts, and in the main the world-wide extant

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[3] Logically, of course, one should *start* from a clear definition of what is to be measured; but the extant national accounts backcast "GDP," and in practice any proper aggregates will be derived from the GDP series themselves, with suitable sanding and filling.

corpus, altogether ignore the above rules: their methodology, the international-standard methodology to this day, is the mark of "first-generation" estimates. Elementary production estimates properly derived from the sources, respecting the first three of the above rules (and only those), are "second-generation" stuff; estimates of "real value added" properly derived from those the physical-product estimates, respecting also the fourth rule, are of the "third generation"; and proper estimates of aggregate product would be estimates of the "fourth generation."

These generations are in some ways biblical. The fourth and last may well take damn near forever, as conventional GDP is vigorously defended by entrenched international bureaucracies, and happily accepted by an economics profession that would rather play silly-buggers with ready-made "data" than seriously address the problem of measuring "the economy"; when we will finally move beyond "GDP" to something intellectually respectable God only knows, and She ain't telling. Closer to hand, even the derivation of the "second-generation" production estimates is enormously time-consuming: a single industry group can take many years of work, to familiarize oneself with the direct evidence, even more to discover and recognize the indirect evidence, to develop step by step the algorithms that finally transform it into an acceptable version of the desired times series. *Italia docet*: after decades of dedicated effort my second-generation estimates of industrial production are still incomplete, and it may well take another half-a-dozen years, Lachesis permitting, to round out the set.

The third generation is not particularly challenging, but common deflation requires the prior construction of current-price value added estimates, estimates obtained by mating the thousands upon thousands of year- and product-specific quantity estimates with matching year- and product-specific estimates of value added per physical unit; and these last have yet to be compiled. In the interim, to satisfy our curiosity, to get an idea of what may eventually emerge, we construct "second-generation" national accounts that simply combine the extant second-generation product estimates, and preliminary indices for the sectors not yet properly studied, with base-year weights, a mere few hundred product-specific estimates of value added per physical unit, all calculated for the same "base" year. Such accounts are mere temporary structures built with a still inadequate stock of materials: because they incorporate preliminary series as well as proper second-generation disaggregated estimates (whence of course their progressive revision as the latter component expands and the former shrinks); and because they are measures "at constant prices" that correspond implicitly to activity-specific deflation, and thus distort the composition of the aggregate, increasingly so as one moves further from the "base year."

But these last distortions are tied to changes in relative prices, themselves tied, in the main, to differential productivity growth; and about that, in the large, we have a fairly clear notion. We know therefore *how* our second-generation structure is distorted, at least *dans les grandes lignes*; and we can tentatively correct for that, producing conjectural third-generation subaggregates and summary national accounts not at base-year prices but at the base-year price *level*.

All this has to do with the reconstruction of the economy's path from the production side of the national accounts – for the good and simple reason that spending data are so limited that an *independent* reconstruction of the expenditure side is not in practice possible. In practice, the expenditure side is obtained by suitably disaggregating, by spending category, the aggregate reconstructed from the production side; it follows that the expenditure-side estimates do not involve their own generations, but simply share those of the production side from which they are derived.

2. THE EVOLUTION OF ITALY'S HISTORICAL NATIONAL ACCOUNTS

2.1 The data, the centenary reconstruction, and its aftermath[4]

Italy was unified in 1861. The State did not of course systematically monitor the economy then as it does now, and on the real side of interest here the data environment is not exactly lush. The oldest, most continuous sources are those that reflect specific interests of the State, indeed of the fisc. There are, obviously, statistics on foreign trade: these are increasingly detailed, in part because protection took the form of specific duties, and by all accounts relatively reliable. The railway sector, at once taxed, subsidized, and heavily regulated, was closely monitored; shipping too was the object of special legislation, and extensively documented. Commodity production was instead monitored only in exceptional cases. The richest data refer to the mining sector, as the sub-soil belonged to the Crown; salt and tobacco were State monopolies; ships were registered, and shipbuilding correspondingly tracked; and a few minor industries were monitored because they were subject to production taxes.

The State was of course not uninterested in the wealth of the nation, and generated a growing corpus of production figures. Agriculture in particular was subjected to an initial survey, which provided loosely synchronic cross-section estimates, around 1880. Annual production figures were then produced for a few major crops (grain, wine, silk), but the estimating procedures were amateurish and the results notoriously unreliable; a serious statistical service appeared only in the early 1900s.

Industrial statistics also became more abundant. A few industries were richly documented in the immediate aftermath of Unification, but these efforts remained one-offs. Over time, however, the mine inspectors gradually extended their inquiries to related sectors, and added production figures for metalmaking, chemicals, quarrying, and non-metallic mineral processing. Systematic surveys of industry were also put in hand. An initial survey proceeded slowly, province by province, and finally yielded a cross-section updated to 1903. A first industrial census was taken in 1911; but inexperience told, and the census failed to pick up "domestic" activity (apparently activity at the owner's residential address, even in large plants).[5] The surveys and the industrial census provided employment and horsepower data; comprehensive information on value added, outputs and inputs would come only with the industrial census of the 1930s.

Finally, the State counted its citizens, at decadal intervals, from 1861 (skipping 1891, a crisis year, in an effort to save money). From 1871, detailed labor force figures are also included, by sector of activity; the distinction between housewives and domestic textile workers took a long time to settle down, but the figures for males seem relatively reliable. For a significant subset of the services, the only direct evidence is that provided by the census labor-force data.

By the standards of today, these pickings are slim indeed; but the standards of the time were very different. Economic measurement was then aborning, and the Italian school was in fact among the world's best: the data on which we can base Italy's historical national accounts are very incomplete, but not exceptionally so.

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[4] Parts of this section are taken, with permission, from Fenoaltea (2010), © Associazione Paolo Sylos Labini. For a more detailed account and the appropriate references see Fenoaltea (2015a).

[5] Information on such activity was to have been provided in a dedicated section of the demographic-census form sent, on the same day, to every residential address; but the results proved too spotty to be worth tabulating (Fenoaltea 2015b).

From these limited data Italy's historical national accounts have repeatedly been reconstructed.[6] The first effort, then a pioneering one, was prompted by the centenary of national unification, and in the later 1950s Istat (then the Istituto centrale di statistica) published the first set of historical national accounts from Unification right up to the then present (Istat 1957). This initial effort included a complete reconstruction of the expenditure accounts at both current and constant (1938) prices; the corresponding production accounts included constant-price series for core agriculture (cultivation and herding) and core industry (manufacturing), but were otherwise presented at current prices alone.

A few years later, under the auspices of the Kuznets-Abramowitz S.S.R.C./Ford Foundation project on the economic growth of the industrialized economies, Giorgio Fuà organized the "Ancona group"; the statistician of the group, Ornello Vitali, completed the constant-price production accounts using Istat's own partial or related series (Fuà 1966, 1969).[7] The Istat-Vitali corpus constitutes the "first-generation" estimates of Italy's historical national accounts, not only chronologically but methodologically, as per the above taxonomy: they adhered strictly to the international standard methodology of the day, at the time absolutely unchallenged.[8]

As was soon pointed out, the Istat-Vitali estimates for the decades to World War I seemed very seriously to distort the path of both agriculture and (downstream) industry because they acritically incorporated unsound series in the historical sources, and leveraged the error by using these "known" series to represent "unknown" ones (Fenoaltea 1969, 1972). Tragically, both Istat and Vitali described the derivation of their estimates only in very general terms; the underlying research was held back, and finally lost. The published results could not therefore be subjected to detailed scrutiny, much less to piecemeal revision: they had to be accepted as they stood, or rejected outright. In the circumstances, most scholars took the Istat-Vitali reconstruction at face value; a few tried to improve it by rearranging Istat's own materials; and fewer still embarked on the effort to replace it altogether.

The task of reestimating industrial production (from Unification only to the Great War) was taken on – in the mid-1960s, just as Vitali was completing his own effort – by the present author; the starting point was the Gerschenkron index, the construction of which was documented in detail (Gerschenkron 1962 [1955]). In the early 1980s, Albert Carreras independently produced a long-term reconstruction of Italy's industrial product, again fully documented, and the more impressive because it was only half the groundwork for his comparative project on Italy and Spain (Carreras 1983, 1992, 1999). Also in the early 1980s the task of reestimating agricultural production was taken on by Giovanni Federico, with whom the present author would long work closely; and a few years later still, with an eye to its own centenary in 1993, the Bank of Italy commissioned a progressive revision of the entire historical national accounts. The first fruits of this project were benchmark reconstructions of both the production and the expenditure side, at current prices, for 1911, and then for 1891, 1938, and 1951 as well (Rey 1992, 2000, 2002); these are returned to below.

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[6] A more detailed review of the literature may be found in Fenoaltea (2011a), ch. 1.

[7] Vitali also tinkered with the expenditure side. Istat's pioneering estimates had excluded *intermediate* government services from aggregate final product, as per the Italian tradition; Vitali's estimates included them, as do our more recent ones, as hegemonic America imposed its own inferior practice on the world.

[8] The recent claim that that corpus was judged "not up to international standards" (*Cliometrica* 13, 2019, p. 408) is entirely contrary to fact; that it sailed right past the referees suggests an interestingly literal-minded approach to "peer review."

As these efforts were progressing a production-side revision of the GDP series was proposed by Angus Maddison, who had found the initial levels of the Istat-Vitali GDP series impossibly high. To reduce initial GDP, working backwards, he needed to increase its growth rate; and he did this in two ways. He had no alternative to the Istat-Vitali series for agriculture and the services, but replaced their slow-growing industry series with one that grew much more rapidly, a series he constructed by cherry-picking industry-specific series from my own work (ignoring, in particular, my estimates for the relatively stagnant traditional sectors). Not content with that, he further increased the growth rate of the aggregate by combining his sector series using early Istat weights: throwing logic to the winds, he attributed to industry the large backcast early share of aggregate value added implied by the slowly growing Istat-Vitali series rather than the much lower backcast early share implied by his own rapidly growing series.[9] Maddison's statistical legerdemain thus increased, as he wished to, the aggregate growth rate; but it changed little else, and his aggregate's short- and medium-term movements remained essentially those of the original (Maddison 1991; Bardini, Carreras and Lains 1995; Fenoaltea 2005; Figure 1).

An alternative revision of the GDP series from the expenditure side was proposed shortly thereafter by Nicola Rossi, Andrea Sorgato, and Gianni Toniolo. Their series began in 1890; it reweighted the original Istat-Vitali series using the new benchmark for 1911 published under the auspices of the Bank of Italy, and over the period of interest here it differed from the Istat-Vitali original even less than Maddison's (Rey 1992; Rossi, Sorgato, and Toniolo 1993; Bardini, Carreras, and Lains 1995).

2.2 The early second-generation estimates

Meanwhile, even as the first-generation Istat-Vitali estimates were being completed, the second generation tiptoed onto the scene. The author's very first reconstruction of post-Unification Italy's industrial production (Fenoaltea 1967) improved on Gerschenkron's by extending disaggregation (e.g., to allow for trade in cotton yarn) – and thoroughly revised it by actually vetting the data in the sources. The series that didn't pass muster were corrected (e.g., the grain-consumption series), or simply eliminated (e.g., the silk-production series): a small step for a man, a tiny step for mankind, but a long overdue innovation.

That first reconstruction also respected, in a backhand way, the third rule above: the aggregate series was considered a measure of *documented* production alone, and not of aggregate production. The author's first estimate of *aggregate* industrial (actually manufacturing) production (Fenoaltea 1972) did *not* attribute the observed paths to the unobserved series: documented production there represented only itself, undocumented production was estimated in its own right. The application was crude – because documented production appeared to cover the rapidly growing "modern" industries and the cyclical industries, undocumented production was identified as that of the traditional artisanal industries, and attributed a simple, slowly rising trend – but the principle was sound and, once again, innovative.

The author then did one more thing, surely not unprecedented, but which was at the time (and so remains today) very lonely work: he thought of economic measurement as an economist, and not a mere statistician. The upshot was what I now call the fourth rule, the rule that deflation must be common and not activity-specific, the rule that when observed will yield our third-generation estimates (Fenoaltea 1976). With that, I was satisfied that I

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[9] That his procedure was logically indefensible was pointed out to him, and acknowledged by him, before his reconstruction was published; the correspondence survives.

understood what my reconstruction of industrial production actually was, and how it should be interpreted; with that, I settled down to work. The first industrial sector to boast complete second-generation coverage was the utilities sector (Fenoaltea 1982); those estimates were *inter alia* the first to estimate the product of the ill-documented water-distribution industry in its own right, the first *not* to assume that the growth of that age-old industry was an internal average of the growth of the recently invented gas industry, and the even more recently invented electricity industry.

From about that time, as noted above, my work on industry was paralleled by Giovanni Federico's work on agriculture. The Bank of Italy took notice, and as also recalled above soon commissioned a revision of the historical national accounts, starting with current-price estimates for 1891, 1911, 1938 and 1951. This "benchmark project" was directed by Guido Rey; the principal investigators of the "benchmark team" included Giovanni Federico on agriculture, the present author on industry, Vera Zamagni on the services, and Ornello Vitali on aggregate GDP and the expenditure side (Rey 1992, 2000, 2002).[10] Shortly thereafter, for 1861−1913 the present author published 1911-price series for industry, by sector (Fenoaltea 2002a, 2003), and Giovanni Federico published current- and 1911-price series for aggregate agriculture (Federico 2003a, 2003b). These time-series estimates incorporated years of research, but remained preliminary: the industry series because the still-unstudied sectors were represented by very crude indices, the agriculture series because it allowed for equilibrium responses to price movements, but not for short-term weather-related harvest fluctuations.

The time seemed ripe for an equally preliminary revision of the historical national accounts: the first "second-generation" accounts, the first to remove the critical methodological flaws of the "first-generation" Istat-Vitali estimates. A 1911-price 1861−1913 production side was soon reestimated (Fenoaltea 2005): it combined the new Federico and Fenoaltea commodity-production series with new 1911-price series for the services obtained by extrapolating Zamagni's 1911 "benchmark" estimates with suitable real

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[10] The project's treatment of maintenance warrants clarification. The international standard is to distribute maintenance over industry and services, and over net production that inflates GDP and costs of production that do not (e.g., most recently, United Nations 2008); a moment's thought suggests it should be treated uniformly, as industry, and as net production (Fenoaltea 2020). In the case at hand, two points bear notice. One is that the "benchmark" sector definitions leave in industry the maintenance of almost all durables, and attribute to the services only the maintenance of non-leather apparel (mainly contract clothes-washing). The second is that Vitali's 1911 benchmark explicitly claims to consider maintenance a cost of production, to be excluded from capital formation, and his input-output table duly treats the maintenance produced by the engineering industry as intermediate purchases by the other sectors; but he then adds those purchases and the various activities' value added, as estimated in the sector-specific chapters, to obtain each activity's gross value product, and his GDP is simply the sum of those value added estimates and indirect business taxes (Rey 1992, pp. 294–295, 314–318). But those value added estimates are gross of the sectors' own maintenance expenditures, just as they are gross of their expenditure on banking services; Vitali's definitions would require the exclusion of double-counted maintenance (or the reduction of each activity's value added by its expenditure on maintenance, so that maintenance does not artificially inflate the estimated value product figures). The upshot is that Vitali actually and apparently unintentionally counts maintenance as net production that enters GDP; and to the extent that his investment figures exclude it, his consumption figures are correspondingly inflated. None of this was apparently noticed at the time, indeed at any time before the present.

indices.[11]   As we knew it would be, the measured path of GDP was radically altered (Figure 1).   The turn-of-the-century acceleration that characterized the first-generation estimates altogether disappeared: the dominant pattern was a ("Kuznets cycle") long swing in the production of durables (with upswings over the 1880s and the *belle époque*) superimposed on relatively steady trend growth.[12]   Some years later the corresponding 1911-price expenditure side was also reconstructed (Fenoaltea 2012): it incorporated the new Federico-Natoli-Tattara-Vasta trade series (Federico *et al.* 2011, also commissioned by the Bank of Italy), and allocated the production side to private and public consumption, and to investment, as suggested by Vitali's current-price expenditure-side estimates for 1911 (without grasping their distortions, above, footnote 10).[13]

2.3 The sesquicentenary reconstruction: the production side

Then Italy's sesquicentenary hit, and it was *déja vu* all over again. Istat (by then the Istituto nazionale di statistica) and the Bank of Italy ordered up a reconstruction of the historical national accounts, post haste, as the groundwork for a broad reconsideration of the Italian economy from Unification to the present day. The entire project would be directed by Gianni Toniolo (Toniolo 2013a).   The reconstruction of the current- and constant-price historical national accounts was entrusted to the Bank's Alberto Baffigi, who devoted to the issue much sophisticated thought (Baffigi 2015), but was forced by his stringent deadline to take a number of practical short-cuts (Baffigi 2011, 2013).[14]

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[11] An intermediate GDP series that combined the new Federico and Fenoaltea series for agriculture and industry with the extant Istat-Vitali estimates for the services was immediately calculated by Gianni Toniolo (Toniolo, 2003), but it was quickly superseded.

[12] On the Kuznets cycle see Fenoaltea (2011a), pp. 67–108. The neo-gerschenkronian resurrection of the Istat-Vitali trend break compares the trough-to-trough growth rate to 1896 to the trough-to-peak rate from 1896 to 1913: see Fenoaltea (2017b), pp. 22–26, and references therein.

[13] This paper circulated, under varying titles, from 2009; the ms. is cited in Gomellini and O'Grada (2011) and again in Baffigi (2015), p. 171. The early versions used the trade series in Fuà (1969).

[14] The relevant pages of Baffigi (2013) appear to be verbatim reproductions of Baffigi (2011); the earlier publication is referenced here, as it is (when last consulted, June 2017) conveniently downloadable at https://www.bancaditalia.it/pubblicazioni/quaderni-storia/2011-0018/QSEn_18.pdf. Baffigi (2015) provides useful further details, and a penetrating discussion of the broader methodological issues that devotes much-deserved attention to the writings of Giorgio Fuà. Italian is alas no longer the common language of cultured Christendom: a translation of Baffigi's work (and, ideally, Fuà's) would be most useful. It must also be said that Baffigi's book represents, at the same time, a terrible disappointment. Given in particular the interests of Enrico Giovannini, then head of Istat, there was room to hope that the sesquicentennial project would pioneer a truly path-breaking ("fourth generation") statistical reconstruction of what "domestic product" really is (including leisure-time, "family production," and changes to such public capital as the natural and urban environment, while excluding such "social intermediates" as the police, the military, the accountants that fill out government forms, *et hoc genus omne*). Baffigi's reflections on those issues would have been far richer fare, but it was not to be. Istat and the Bank had much bigger fish to fry, and the sesquicentennial project was apparently left entirely in Gianni Toniolo's good hands. Another rat ran through the standard-national-accounting maze, and yet another does so here: one would think that rats, at least, deserve more intellectually respectable challenges.

An early decision of the "sesquicentennial team" was to take as given the production- and expenditure-side estimates produced by the "benchmark team," as recapitulated by Vitali (Rey 2002); a further benchmark was manufactured for 1871, but in the event it was never documented (Baffigi 2011, p. 55). These benchmarks would be maintained *de pied ferme*, forcing through them, as necessary, all the time series, old and new; like the preliminary second-generation estimates in Fenoaltea (2005, 2012), therefore, Baffigi's reconstruction was based on the earlier "benchmark" figures, and inherited their contradictions and distortions (above, footnote 10).

Baffigi then began, as he had to (§1.2), from the production side. For agriculture, over the period at hand, Baffigi borrowed the aggregate production series and deflator in Federico (2003a); for industry, he borrowed the constant-price sector aggregates in the present author's production-side estimates (Fenoaltea 2005), and derived their current-price equivalents using the "centennial" deflators (Fuà 1969). For the services, he could have done exactly what he did for industry. He did not: the present author's 2005 constant-price series for the services were altogether set aside, and the "sesquicentennial team" reconstructed the time path of the services from the sources up.

This exceptional attention to the services sector presumably reflects the influence of Zamagni's immediate dismissal of the constant-price series in Fenoaltea (2005) as simply "unacceptable" (Zamagni 2006), and the apparent lack of influence of the subsequent rebuttal (Fenoaltea 2011b). Be that as it may, of the Bank's "benchmark team" she alone survived to contribute new estimates to the sesquicentennial project. With her former students Patrizia Battilani and Emanuele Felice she produced new current-price series for the services (Battilani, Felice, and Zamagni 2014); the (newly estimated) quantity series that entered those estimates were then used by Baffigi (with Istat's Alessandro Brunetti) to compile the corresponding constant-price estimates (Baffigi 2011, p. 56, 2015, pp. 106–110).[15] It may be noted that this procedure guaranteed consistency between the new current- and constant-price estimates for the services themselves, but introduced inconsistency between the estimates for the services and those for industry, as some services are produced by stocks augmented by industrial production; this inconsistency the present author's 2005 reconstruction had been careful to avoid.[16]

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[15] There is irony here, as Zamagni considered the present author's service-quantity series "unacceptable" because they yielded a (1911-price!) share of the services in 1861 that was, to her mind, clearly too high (Zamagni 2006, p. 374). The Battilani-Felice-Zamagni quantity series, incorporated by Baffigi and Brunetti, imply a (1911-price) share of the services in 1861 that is even higher (37 percent instead of 35): by Zamagni's standards, her own series are even less "acceptable" than mine.

[16] The most serious inconsistency in the sesquicentennial corpus actually reflects a different one, internal to Zamagni's work. Her 1911-demographic-census-based benchmark estimates for the services assume that the labor force was, in essence, fully employed (Rey, 1992, e.g., pp. 202, 224–226). At the same time, she insists that industrial employment must be taken from the (partial) industrial census of that year, implying an unemployment rate in industry, at the peak of the pre-War boom, in excess of 40%. The sesquicentennial labor force and employment estimates by Claire Giordano and Francesco Zollino, also of the Bank of Italy, follow the road Zamagni paved with good intentions; they are inconsistent with the estimates for industry, and the resulting "productivity" measures are sheer nonsense (Toniolo 2013a, Tables A5 and A6; Giordano and Zollino 2015; Fenoaltea 2015b, 2016, 2017b, footnote 60). Giordano and Zollino have not replied to criticism, and simply continue to use their series as if nothing were amiss (Giordano and Zollino 2017). Zamagni has instead reaffirmed her position (Zamagni 2016); she is apparently ready to believe both that

In the event, Baffigi's 1911-price production side did not differ much from that in Fenoaltea (2005), not least because they had much in common. Both used Federico's series for agriculture; however, Baffigi's figures are rather lower, with a reduction that grows smoothly from some 5 percent in 1871 to 7 percent in 1891, and then progressively declines to vanish by 1911.[17] Both used the present author's industry series (in Fenoaltea 2005, themselves taken from Fenoaltea 2003), and (at constant borders) the figures are identical. The series for the services differ, of course, but both were anchored by the "benchmark" estimates for 1911 in Rey (1992, 2000, 2002); Baffigi's sector aggregate is typically marginally higher, with a difference equal to some 2 percent in the 1870s and 1880s, rising to approach 5 percent around the turn of the century, and then progressively vanishing.[18]

The changes to the sector aggregates are small and largely offsetting. Baffigi's estimate of aggregate value added is 98.6 percent of the 2005 estimate in 1871, dropping to 97.0 percent of it in 1891, and then climbing back to equality by 1911: all things considered, Baffigi's sesquicentenary 1911-price production-side estimates did not significantly depart from the preliminary second-generation series (Figure 1).

2.4 The sesquicentenary reconstruction: the expenditure side

As noted, both the above-mentioned second-generation expenditure side that eventually appeared in Fenoaltea (2012) and the sesquicentenary expenditure-side in Baffigi (2011) were derived, as they had to be, by disaggregating the estimate of GDP obtained from the production side; and they were derived from what were in fact, as just noted, very similar production sides. Contrary to what could have been expected, however, the two estimates of the expenditure side emerged with no consensus at all.

The present author's expenditure side was simply conceived, never going beyond the basic components *C*, *I*, *G*, *X*, and *M*, and simply derived. The 1911-price production-side estimates of value added were broken down into 22 components. These production series and

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industrial unemployment could exceed 40 percent (and implicitly much more, in less prosperous years), and that such a rate is consistent with near-full-employment in the rest of the economy (as if at the bank or the post office, or when seeking employment, people joined the longest queues rather than the shortest).

[17] Baffigi's series is generally lower because the Federico current-price series was forced through the (Vitali 1891 and new 1871) value-added benchmarks before being deflated by the Federico price index (Baffigi 2011, p. 56).

[18] See below, Figure 2. The Baffigi production- and expenditure-side estimates illustrated in Figures 2 and 5 are direct transcriptions of his 1911-price series at current borders, from 1861 to 1911 (Baffigi 2017), with the following adjustments. First, the effect of the annexations in 1866 (Venetia) and 1870 (Latium) is eliminated by extrapolating his estimates for 1871 back to 1861 using his series at constant borders, the borders of today; the recalculated series are thus, like mine, at the constant borders of 1871–1913. Second, his 1911-price series are extended from 1911 to 1913 using his 1911–1951 1938-price series, none of them, obviously, taken from the present author. Baffigi's services and total value added series also include the entire value added of the banking and insurance industry, and he deducts double-counted banking and insurance services only when passing from aggregate value added to GDP; in Figure 2 the "Baffigi" series in panel C3 directly illustrates the *net* value added in banking and insurance services, and the higher-level "Baffigi" value added aggregates are similarly already net of double-counting.

net indirect taxes were attributed to investment *I*, private consumption *C*, and public consumption *G* with series-specific, time-invariant coefficients; deflated exports and imports were similarly allocated with year-specific coefficients that reflected their composition. The 1911-price expenditure-side estimates thus incorporated evidence of changes in the mix of goods produced and of goods traded, and were consistent by construction with the corresponding production side.[19]

No doubt because the present author's reconstruction was still circulating privately, Baffigi made no use of it.[20] The expenditure side he essentially reestimated *ex novo*, and in greater detail than the present author's, saving limited time by borrowing some series from the earlier literature, and estimating the others through the use of puissant algorithms. As he retells it (Baffigi 2011, pp. 60–63), and as recalled above, he consistently used the 1871-1891-1911 expenditure-side "benchmark" estimates (consistent, by construction, with his similarly-anchored production side), if necessary forcing his current-price series through them. That apart, from the "centennial" corpus (Fuà 1969) he took the public consumption series at constant and current prices.[21] From the present author (Fenoaltea 1987) he took the constant-price "value of new construction" series (which does not include maintenance), mated it to the "centennial" deflator (Fuà 1969) to generate the corresponding current-price series, and pressed these into service to represent "investment in construction."

The other consumption and investment series were new estimates, indexed by proxies and then jointly rescaled to maintain consistency with the (at that point given) production-side estimates of GDP. Private consumption at current prices was indexed directly by the imports of consumption goods, from the Federico *et al.* (2011) database, and then deflated by Istat's cost-of-living index. Investment in plant, machinery, and transport equipment was similarly indexed to 1880 by the net imports of the appropriate goods from the Federico *et al.* (2011) database, and then by the import-quantity series in Warglien (1985), using the Fuà (1969)

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[19] The title of Fenoaltea (2012) refers to the deconstruction, as well as the reconstruction, of the expenditure side. The former showed how the Istat-Vitali reconstructions were (like Maddison's) made to tell (in quantitative terms) the story their proponents believed to be true, *ex ante*. The logic of the story overrode both evidence and logic *tout court*; to belabor the point, it takes considerable *naïveté* to consider economics a science, and economic "data" (which they in fact are not) as objective "observations" rather than culture- (and prejudice-)bound constructs.

[20] Publication of the present author's expenditure-side estimates was ironically delayed by the Istat-Bank of Italy project itself: as one referee put it, there was no reason s/he could see "why we cannot wait for an official more thoroughly researched generation of national accounts" (attached to the rejection letter from Cormac O'Grada, then editor of the *European Review of Economic History*, January 27, 2010). In the circumstances, "official" and "more thoroughly researched" sat together poorly, as the one involved a deadline that precluded the other.

[21] The constant-price public-consumption series reflects the corresponding production-side government services series, apparently badly distorted by a very poor deflator (Fenoaltea 2005, pp. 292–296). The complaint is not that Baffigi borrowed a series from the "centennial" corpus – that would be a stone thrown from a glass house (Fenoaltea 2005, p. 310) – but more specifically that he borrowed one that was known to be grossly distorted, and is, on top of that, quite inconsistent with his "public administration" production estimate (compare below, Figure 2, panel C6 and Figure 5, panel D).

machinery price index for the appropriate conversions (Baffigi 2015, pp. 142–143).[22] Residual investment (some 20 percent of the total in 1861 and from 1885, but with an intervening peak of 35 percent in 1875) includes ("agricultural") investment in horses for urban services (indexed by the transport and communication production series), but its dominant component refers to (industrial) "investment goods produced by other sectors," that is, all save engineering and construction. This last appears to have been estimated first in current terms, as a percentage (linearly interpolated between the benchmark figures) of that in plant, machinery, and equipment, and then deflated by the Istat cost of living index (ibid., pp. 145–146).

With these algorithms Baffigi obtained, from a 1911-price production side very similar to the present author's, an expenditure side that was at times very different (below, Figure 5). My government-consumption (*G*) series grew quite regularly, interpolating and extrapolating census benchmarks, with upside deviations to reflect the Austrian war of 1866 and, at the very end, the Libyan war; Baffigi's, as noted a *reprise* of Vitali's, registered similar growth from end to end (1861–1911), but displayed a strong *decline* over the first twenty years, then made up by faster growth. The private-consumption (*C*) series were much nearer each other, and both captured the new (*rectius* revived) conventional wisdom, to the effect that the 1880s were a period of rising consumption, like the *belle époque*, rather than a period of crisis, as claimed by the post-war historiography (Fenoaltea 2002b, 2011a, ch. 3). They were especially close after the turn of the century; before that, however, Baffigi's was consistently, perceptibly higher than mine. Major differences again marked the investment (*I*) series, perhaps the most significant for our "interpretation" of the economy's growth. Mine displayed the (Kuznets-cycle) long swing, already evident in the production side. Baffigi's was dominated by a step-wise process: it displayed low investment in the 1860s, rapid growth to a markedly higher level in the early 1870s, fluctuations around that level, with only modest trend growth, into the later 1890s, a decade of rapid growth to a peak in 1907, and then a decline. The "take-off of the Giolitti years" evident in the first-generation GDP series was absent from the initial second-generation GDP series, and from Baffigi's too; but it was dramatically reintroduced by his investment series.[23]

These differences between the sesquicentenary and the (preliminary) second-generation series appear to be distortions rather than improvements. One source of weakness is Baffigi's use of the "centennial" price indices, which are as noted of questionable quality.[24]

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[22] With respect to 1881–1911 Baffigi (2011), p. 62 refers only to the "Warglien (1985) quantity index"; Baffigi (2015), p. 142 confirms that the reference is to Warglien's net-import-tonnage series (Warglien's Table 1, cols. 3 and, in index form, 4), and not to his constant-price-apparent-consumption-of-machinery series (his Table 7, col. 3), which varies altogether less (with a peak in 1908 just 1.20, as opposed to 1.78, times the 1911 benchmark). Warglien's apparent-consumption series reflects the present author's work in progress at that time; in the light of more recent work, between 1881 and ca. 1895 its time path too is seriously distorted (Fenoaltea 2017b).

[23] Baffigi's investment series does not appear to be referenced in Toniolo (2013b), but its turn-of-the-century step change is clearly grist for Toniolo's neo-gerschenkronian/neo-rostowian mill (Fenoaltea 2017b, pp. 23–25).

[24] The cost-of-living index in particular seems to understate the fall in the cost of living in the early 1880s (Fenoaltea 2002b, p. 285); also above, footnote 21.

A more general concern stems from his use of consumption- and investment-good imports to proxy for the corresponding, much larger, expenditure aggregates.[25] The procedure assumes, or at least hopes, that imports and domestic production essentially moved together: ideally in lock-step (as if shocks were demand shocks and world and domestic supply elasticities were much the same), or at least in similar proportions across sectors (as the common error would then be appropriately corrected by the final, joint rescaling). Given the swings in the openness of the Italian economy over the period at hand (Federico *et al*. 2011, p. 5; Fenoaltea 2012, p. 293), and their differentiated causes, that assumption seems weak, that hope forlorn. Between the late 1870s and the mid-1890s a series of tariff hikes represented sector-specific relative-supply shocks, that tended to move imports and domestic production in opposite directions; over most of the 1880s, the "grain invasion" was a major consumption-specific supply shock, and domestic grain production, at least, surely fell as imports surged and prices dropped; over the early 1900s the surge in demand for investment goods was *initially* met very largely by imports, as the short-run import-supply curve was significantly more elastic than its domestic counterpart, and after 1908 imports fell as domestic production continued to increase (Fenoaltea 1967, 2017b; also Warglien 1985, above, footnote 22).

The most seriously distorted estimates would appear to involve the investment series. After the turn of the century, the distortion is inherited directly from the machinery-import-series proxy, for the reasons noted: the final investment series much overstates the investment boom to 1908, and introduces a subsequent bust, because the initial import-based investment series does so.[26] Over the early 1880s, in contrast, the import proxies much overstate the growth of *consumption*; but consumption is much the largest component of the expenditure side, and whatever the vagaries of the initial estimates the rescaling of the figures to meet the GDP constraint reduces their final error to a relatively small one. But that rescaling is applied to the investment series as well: the overstatement of consumption is reabsorbed in part by reducing the overstatement of consumption itself, and in part by understating investment. Baffigi's investment estimates show a quantum jump around the turn of the century, but it would seem to be the product of their shift from a downward bias over the preceding years to an upward bias over the later ones.[27] The present author's preliminary expenditure-side estimates were simply constructed, and lack the investment breakdown of Baffigi's; but because they also reflect the domestic production of consumption and investment goods – and not just, as his do, the path of imports – they appear to be intrinsically sturdier.

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[25] The figures in Baffigi (2015), pp, 178–180, 185–187 have imports varying, over the period at hand, between 8 and 14 percent of total resources (GDP plus imports), and between 10 and 19 percent of (mis-labeled) private consumption plus non-construction investment: the extrapolation from a small part to the whole is akin to attempting the reconstruction of an entire skeleton from a handful of bones.

[26] Because the short-run elasticity of the world investment-goods supply curve exceeded that of the domestic supply curve, imports were far more volatile than domestic production; they fell after 1908 not because demand fell, but because the growth in demand decelerated.

[27] The public-consumption and construction-investment series were not rescaled; but that simply increased the necessary rescaling of the residual (consumption, investment) series, and the point stands.

Both Fenoaltea (2012) and Baffigi (2011) took their trade series from Federico et al. (2011), but here too discrepancies appear. The two export series are quite close; Baffigi's series is perceptibly higher over the 1860s, but that is because his series was converted from current to constant (post-1871) borders, and mine was not. The import series differ by more than that, and Baffigi's remains well above mine from 1861 through the mid-1880s; the bulk of the discrepancy seems traceable to Baffigi's forcing of the sesquicentennial series through the current-price 1871 benchmark produced within the sesquicentennial project itself (reported in Baffigi's worksheets as 1,190.7 million lire, against 961.47 million lire reported by Federico *et al.* 2011, p. 88).

3. THE REVISED SECOND-GENERATION ESTIMATES

3.1 The production side

The new, revised second-generation estimates were developed sequentially; the first set (Table 1) refers to the production side, also illustrated in Figure 2.[28]   As seen above, there was no deep complaint with Baffigi's production side; its revision was undertaken with an eye to marginal improvements, to a modest harvest of low-hanging fruit.[29]

The revised estimates for agriculture improve the Federico series of the earlier (2005) reconstruction in two ways. First, they incorporate evidence of year-to-year harvest fluctuations, which the extant estimates omit; this is done by applying to Federico's series the annual deviations from trend of the Istat-Vitali series, calculated over the sub-periods when the latter was reasonably homogeneous. This revision is particularly useful, as it eliminates the extant sector and GDP series' spurious smoothness (Baffigi 2015, p. 99). Second, the revised estimates include an allowance for on-farm improvements, which the previous production-side estimates simply overlooked. The allowance tentatively distributes over time, with an eye to the path of production, a cumulative figure based on calculations performed long ago by Ornello Vitali; fortunately, that figure is small, and not much is here at stake.

The revised industry series in turn incorporate the recent results of the author's ongoing work. On the one hand, they update the 2003/2005 second-generation estimates for the extractive, metalmaking, non-metallic mineral products, chemical, and utilities industries; on the other, they replace the preliminary series for the engineering industry, and the leather industry, with proper second-generation estimates, newly compiled. The other industries continue to be represented by the 2003 estimates: some may be considered good (the second-generation estimates for textiles, apparel, paper and publishing, construction), the others are clearly poor (the preliminary aggregates for food, tobacco, wood, and manufacturing n.e.c.).

With respect to the figures in Fenoaltea (2005) the time paths of industry's four main sectors are differentially revised. For the extractive industries, the revision points to a stronger decline from the mid-1880s to the mid-'90s; this stems almost entirely from an

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[28] To avoid insignificant but annoying discrepancies, all the subaggregates and aggregates reported in the tables are obtained by summing over the appropriate series as also reported, rounded, in the tables.

[29] As far as maintenance is concerned, Fenoaltea (2005) explicitly counted it as net production, as opposed to a deductible cost of production; and so *de facto* did Baffigi (2011), who also borrowed the Vitali production-side "benchmark" estimates (above, §2.2, footnote 10).

improved aggregation algorithm that better captures composition effects within mining on the one hand and quarrying on the other. For manufacturing, the revision reflects the new second-generation estimates: the estimates for the early years are perceptibly higher, and the long-term growth rate lower, mostly because the large leather industry appears to have grown much more slowly than had been surmised. The construction-industry estimates, carefully obtained long ago, are unchanged; those for the utilities industries have been amended, and now also display higher initial levels and lower growth. The emendation is entirely in the estimates of the aqueducts' product, and reflects a change in the interpretation of the sources: the early estimates assumed that the undated aqueducts had been constructed at the same pace as the dated ones, the new ones assume that the undated aqueducts were all already present in 1861, that they were undated because they were too old to be dated. Industry is dominated by manufacturing, and the revisions to the estimates for industry as a whole much resemble those for manufacturing alone.

In the case of the services, as noted, Fenoaltea (2005) and Baffigi (2011) independently extrapolated the "benchmark" estimates for 1911 obtained by Zamagni (in Rey 1992, partly revised by Zamagni and Battilani in Rey 2000); our disagreement clearly called for a revision of those extrapolations, the construction of improved indices that would supersede the extant ones. But a careful reading (overlong delayed, *et mea culpa*) of the description of the "benchmark" estimates' derivation unexpectedly suggested that they are rife with serious distortions: those estimates too have been extensively revised, with much more work, and far more serious alterations to the final estimates, than had been anticipated.

The new estimates for the transportation sector combine a significantly lower 1911 benchmark, and a different time path; over the long term the latter largely parallels Baffigi's series, which grew rather faster than that in Fenoaltea (2005). The corrections span a variety of subsectors. The "benchmark" estimates for rail transportation were based on company budgets, adding a return to capital to the reported wage bill. The procedure failed to exclude the railway companies' industrial activities (construction, rolling-stock maintenance), already (and rightly) covered by the estimates for industry; the corrected transportation estimates eliminate this double-counting. The extrapolation of the new benchmark is also improved; it is now based on vehicle-ton-kilometers, a metric that allows for the growth of the cars' unit weight and unit carrying capacity. The "benchmark" estimates for other inland transportation have also been reduced, to eliminate workers improperly included, and to cut the wage bill allowed porters (most of whom were apparently not, as Zamagni assumed, highly paid longshoremen). The main improvement is however to the time path of production, based for the first time on the *weight* of the goods actually carted: as it turns out, construction materials far outweighed anything else, and the inland-transportation series now reflects the construction cycle far more than it did before.

The most significant downward revision is to the "benchmark" estimate for the "commerce" sector. Some 150 million lire are cut from the minor hotels-and-restaurants component, mostly by reducing estimated per-capita wages from (mostly) white-collar levels to (mostly) blue-collar levels, and replacing Zamagni's allowance for capital costs (near 40% of labor costs) by a direct estimate of the rental value of the premises. A further ca. 50 million lire are cut from the also minor commercial-services component, mostly by eliminating workers also counted elsewhere. The most unkindest cut of all is however to the figure for trade proper, reduced from Zamagni's ca. 2,100 million lire (Rey 2000, p. 365) to under half that. Zamagni's procedure is complex, but the heart of it seems to be the application of trading margins observed in the 1930s to aggregate marketed consumption in

1911: a combination of bad economics and bad history, *le vice appuyé sur le bras du crime*. Between 1911 and the 1930s differential productivity growth in commodity production and in commerce *raised* trading margins, and so of course did the Fascist legislation that reduced commercial competition: the margins of the later period point not to similar margins, but to *lower* margins, a generation earlier. The application of the estimated margin to *aggregate* marketed consumption backcasts to 1911 our present-day shopping patterns, at the supermarket and the mall; but until recently Italian consumers bought their fresh food directly from the producing farmers (at the "farmers' market," interesting name, that), and a broad spectrum of other consumer goods directly from the producing artisans. The revised estimate for 1911 is obtained as the sum of labor costs (derived from census labor force data), fixed capital costs (the rental value of the premises, based on plausible staffing densities and rents per room), and an estimate of the cost of carrying inventory that reflects on the one hand reasonable total sales *by merchants* (excluding the goods artisans and farmers sold directly to final consumers), and on the other a reasonable inventory-turnover rate.[30] The time path that extrapolates the revised (aggregate) "commerce" benchmark is also new: it is based on the estimated (constant-price) flow of goods actually handled by merchants, including imports as well as domestic goods. Its short-term movements arguably resemble those of Baffigi's series more than those of the author's 2005 series (Figure 2, panel C2).

Banking and insurance services are measured in net terms, deducting those provided to firms but not excluded by the direct estimates of the other sectors' value added. Both the new estimates and Baffigi's start from the new current-price gross value added series provided by De Bonis *et al.* (2011); the main differences are that the new estimates do not force anything through superseded "benchmark" estimates, and that the new estimates deflate the new series with a wage index (converting it into labor units, as is done for other technologically stagnant sectors) rather than with the centennial price index used by Baffigi (which converts it, as noted unreliably, into goods-in-general).

The new "miscellaneous services" series instead essentially returns to that in Fenoaltea (2005), with two minor emendations. One separates out textile-maintenance ("washerwomen's") services (estimated in Fenoaltea 2019), correcting the apparent underestimate of their numbers in the 1911 "benchmark"; the other smooths the series through the census benchmarks. For reasons that are not clear Baffigi's series seems not to capture the changes in composition that fueled aggregate growth from 1901 to 1911.[31]

In the case of buildings' services, the author's 2005 series extrapolated the "benchmark" estimate with a series that reflected the pace of construction; from Battilani, Felice and Zamagni (2014) Baffigi obtained a series that resurrected Vitali's slower-growing

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[30] The unreasonableness of Zamagni's aggregate was in fact signaled by a simple test. The reduction of the aggregate to deduct plausible estimates of both labor costs and fixed-capital costs yielded as a residual an estimate of the implied variable-capital costs, the cost of carrying inventory. These last in turn implied an average investment in inventory which could be set against annual sales; as it turned out, Zamagni's aggregate implies average inventories far in excess of annual sales, and thus an impossibly low turnover rate. The trading margin implied by the new estimate for 1911 is reasonably lower than that observed in the 1930s.

[31] Baffigi's series also dips and recovers between those benchmarks, suggesting log-linear interpolation at the subaggregate level (Fenoaltea 2020).

centennial estimates, based on demographic growth alone.[32]   The new estimates are a *reprise* of the author's, improved in various ways. First, they now display a sharp upward revision of the 1911 rent pool, reflecting a new estimate consistent with the tax on rents, the census room count (including the rooms left empty, largely by seasonal migrants, which the "benchmark" omitted), sample rent data, and the estimated mix of bourgeois and working-class dwellings. The extrapolation is also improved: it now reflects both the pace of construction activity and, boosting the measured growth rate, the increasing concentration of the population in large cities, where real rents were relatively high.

In the case of public administration, the author's 2005 series and Baffigi's were both log-linear interpolations and extrapolations of census-based benchmarks.[33] The revised series essentially keeps the extant 1911 benchmark, but displays a very different time path: it is now obtained from the current-price series Battilani, Felice, and Zamagni reconstructed directly from budget data, so deflated as to reflect the changing mix, and relative remuneration, of career civil servants (and military officers), other civilian public employees, and common soldiers.

For the services as a whole the net result of these corrections is a new series that roughly parallels Baffigi's over the first three decades, and that in Fenoaltea (2005) from then on; it is however sharply lower than both of those, thanks to a 14% cut in the 1911 estimate, from the "benchmark" 7,520 million lire to 6,495 million lire.[34] This reduction to the product of the services reappears of course in the estimate of net value added, and of GDP; the two differ by the allowance for net indirect taxes (this too a *reprise* of the author's earlier series, again somewhat lower than Baffigi's).

The GDP series in Fenoaltea (2005) and Baffigi (2011) were as noted quite similar; the revised GDP series (Table 1, col. 28) is perceptibly more volatile, essentially because it now reflects harvest fluctuations, and from the mid-1880s perceptibly lower (Figure 2, panels E and F), essentially because the services are no longer artificially inflated (and because from the mid-1880s that correction is no longer offset by the addition of previously neglected agricultural improvements).[35] Beyond that, the paths of the three major sectors (to the same scale in Figure 2, panel G), and of their annual growth rates (panel H), reinforce an already anticipated point (Fenoaltea 2011a, p. 47): industry and the services account for GDP's long swing, agriculture for its year-to-year fluctuations.

That the downward revision of the aggregate estimates is specifically in the services, and not in commodity production, bears notice: it is in the main a downward revision of the

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[32] Vitali's estimates had been superseded: his assumption made sense at the time, but subsequently recovered evidence indicated that the construction cycle was tied to capital flows rather than to demographic change (Fenoaltea 1988, 2011a, ch. 2).

[33] Baffigi's series (Figure 2, panel C6) displays what appear to be spurious breaks in 1866–67 and 1870–71: his series at current borders is in fact log-linear from 1861 to 1881, suggesting that it was already at constant borders, and that the subsequent correction for border changes introduced error.

[34] The revised estimate for the services group in 1911 turns out to be much closer to Istat's centenary estimate than to that of the "benchmark team," whose contribution here appears to have been negative. Our progress may be monotonous, monotonic it is not.

[35] The only significant upward revision is with respect to Fenoaltea (2005), in the 1860s; it is due to the revision of the estimates for government services (Figure 2, panel C6).

estimated cost of distribution, the estimates of the quantities of the commodities actually produced (and consumed) are little affected. But it also bears notice that with the new series the per-capita 1911-price income peak of 1886 was not surpassed until 1901, and not, as we had thought, by the mid-1890s (Figure 1).

The revised 1911-price production-side estimates collected in Table 2 maintain the classification of economic activities that informed the earlier estimates, the better to illustrate the substantive revisions to the various component series. Each series is attributed a rough quality index on a scale that runs from 1, for crude first approximations, up to 7 (or more, depending on one's standards). The top recorded score is a 4, given to the series carefully reconstructed from the available evidence by the present author, and definitive under the Nathan Hale constraint; lower scores sadly abound.

Tables 2 and 3 modify the estimates in Table 1 in different ways, to different purposes. As recalled above (§2.3), one strain of the literature is much concerned with the composition of GDP (*rectius*, here, total value added, indirect taxes are not an issue), and specifically with the share of the services sector. Rather obviously, one would have thought, it makes no sense to evaluate the composition of GDP (total value added) in any given year using prices other than those that then prevailed; and this is of course why our second-generation estimates (at constant prices) are unsatisfactory, why we need the current-relative-price-conserving *third*-generation estimates (§1.1, 1.2). These are still well in the future; all one can do at present is to tease out some reasonable conjectures that transform the second-generation major-sector shares into *ersatz* third-generation sector shares by taking into account the apparent relative pace of productivity growth in the various sectors. This exercise, performed years ago with the preliminary second-generation estimates (Fenoaltea 2011b), is repeated here; the not-unfamiliar thrust of the exercise is that the sectors in which productivity increased relatively rapidly will appear relatively larger at early-year prices than at late-year prices. The results of the exercise are presented here in Table 2 and illustrated in Figure 3.

These results differ from their predecessors (Fenoaltea 2011b) mainly in that the major-sector shares of total value added are now more volatile, simply because the new series for agriculture incorporates harvest fluctuations; when agriculture does poorly (as for example in 1889) its share dips, and those of the other sectors pop up. Over the longer term, the main features are unchanged. In productivity terms industry was relatively progressive, and its share of aggregate value added grew less rapidly at current relative prices than at 1911 prices: from some 23 percent, as opposed to 18 percent at 1911 prices, in 1861 to 26 percent in 1911. But 1911 was a peak year in industry's long cycle; discounting cyclical fluctuations, at current relative prices industry's share barely grew at all. Agriculture and the services were less technically progressive, comparably so, and the higher early share of industry at current prices translates into comparably lower early shares for the other sectors. Agriculture's estimated share of aggregate value added thus declines over the half-century at hand, to 41 percent in 1911, from, in 1861, 45 percent, as opposed to 48 percent at 1911 prices; the estimated share of the services, at 1911 prices equal to 33 percent in 1911, barely down from 34 percent in 1861, at current prices grows to 33 percent in 1911 from a barely lower 32 percent in 1861.[36]

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[36] If Zamagni finds these results as "unacceptable" as my earlier ones (§2.3), so be it. She presumes that the share of the services grew smartly in the early phases of Italy's modern economic growth as it did in the later ones, but that presumption is unhistorical: services have grown in recent decades largely as final goods that substitute for (more) commodities, in earlier times they were largely

The production-side estimates collected in Table 1 reflect the Italian-standard classification that informs their immediate predecessors, and not the international standard classification, as recently revised (United Nations 2008). A reclassification of the present sector value added estimates to match the latter standard more closely is provided in Table 3 and illustrated in Figure 4; the reclassification involves the transfer from industry to the services of the value added attributed to the maintenance of such consumer durables as shoes, vehicles, clocks and watches, sewing machines, and the like, and the value added in some new production as well (printing and publishing). The exercise is performed *pro bono*, and does not seem to warrant comment.

3.2 The expenditure side

The second set of revised second-generation estimates refers to the expenditure side; for the reasons just noted, these are based on a production side that differs from the 2005/2011 series far more than was forecast. Methodologically, their recalculation avoids Baffigi's adventurous algorithms, and returns in essence to the present author's earlier effort: as before, the guiding principle is to estimate investment and consumption by allocating to these the production-side estimates of value added (and the value of exports and imports).[37] It would seem more natural to allocate the value of the available final goods to consumption and investment, but that approach is in fact impracticable: the breakdown of final goods and services cannot be calculated directly because the (large) fabricated-metal and wood-products industries both produce a mix of final goods (e.g., tools) and intermediate goods (e.g., elements of buildings), and the composition of the mix is unknown. But we do know that all fabricated-metal products, for example, are (final or intermediate) investment goods, and that aggregate investment therefore includes the entire value added of that industry (and that contributed, supplier by supplier, to its raw materials).[38] The calculation of the expenditure-side aggregates remains based on this simple intuition.

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intermediate goods *complementary* to the production of commodities; that the share of the services (and of commodity production) then varied little should not come as a surprise (Fenoaltea 2011b).

[37] For the reasons detailed in Fenoaltea (2020), the present investment estimates include value added in maintenance, but are sufficiently detailed to allow alternative calculations. Maintenance appears to be excluded from Vitali's investment estimates, but not from his estimates of GDP (above, §2.2, footnote 10). More broadly, the present estimates attribute to investment all durables, save only those purchased by households; Vitali counted as investment most government-financed durables (e.g., roads), but not naval ships (Rey 1992, p. 315; the army's durables would presumably have been similarly treated, had they been separately identified).

[38] This of course to a first approximation, to clarify the concept; the consumer-durable component is in fact non-trivial, but it can be estimated and deducted. As a practical expedient the estimating algorithms were at times simplified (bastardized, if one will) by abandoning the allocation (to the expenditure categories) of production value added and of import and export values, uniformly applied in Fenoaltea (2012). In the case of the industries that processed agricultural products, in particular, the investment component was calculated directly in value terms, including the cost of the raw materials; the (agricultural) production of the latter, and the corresponding international trade, did not therefore need to be considered. Similarly, the investment-good consumption of (other) agricultural goods was estimated directly in aggregate terms, again obviating the need to deal separately with (agricultural) production and imports.

A number of refinements are naturally introduced. First and most obviously, the estimates are no longer constrained by the superseded "benchmark" expenditure-side estimates for 1911 (in Rey 1992, 2002). Second, the joint constraint imposed on C (private consumption), I (gross investment), and G (public consumption) by GDP (from the production side), X (exports), and M (imports) is amended: by the revision of the GDP series, again obviously, and also by a revision of the X and M series, to allow for some miscounted items and for the international freights earned by Italian ships. Third, the estimates of C, I, and G are obtained sequentially rather than together, and in greater detail. Public consumption G is a gimme, estimated first simply by scaling up the production-side figures for government services to allow for the consumption of materials; fixed investment I_f alone is estimated next, by identifying, as before, the components of the here elementary (1911-price value added) production and trade series that are investment goods, or enter their production; private consumption C and inventory investment I_i are then obtained as a large joint residual, disentangled on the assumption that inventory investment could vary sharply from year to year, while consumption tended to be autocorrelated.[39] Fourth, the time-invariant allocation of the elementary series to (fixed) investment is also refined: in Fenoaltea (2012) the elementary series were 22 production-group series, the revised estimates rely where useful on the author's product-specific series, of which there are hundreds. The impact of this last refinement is however perforce a modest one, as it captures only the changing composition of what are, in the present perspective, minor industries; the big-ticket items are the large durable-goods industries like construction and engineering, and these continue to dominate the aggregate (fixed) investment series.

Of these refinements, the most deserving of further comment is the calculation of a separate inventory-investment series. To a first approximation inventory movements are not documented at all, and can be reconstructed only by inference; and the quantitative historiography is not encouraging. In the centennial corpus, it may be recalled, the inventory-investment series was absurd in its own right, and in fact the slack variable that reconciled the production-side story shaped by the sources and the expenditure-side story shaped by the conventional wisdom of the day (Fenoaltea 2012 and above, §2.4, footnote 19). Fenoaltea (2012) ducked the issue altogether, presenting only a "total investment" series that actually referred, by construction, to fixed investment alone. In the sesquicentennial corpus, "inventory investment" and "fixed investment" were both derived from the aggregate investment series, which was subjected to a smoothing process: a perplexing approach, to one whose priors do not particularly limit the short-term fluctuations of stock-adjusting flows, and one that yields implausible results (suggesting for example that a fifth or so of the machinery produced and imported in 1907 and 1908 was left idle: industrial firms would surely not buy equipment just to store it, absent a reason to expect unusual price increases, and merchants burned by over-ordering in one year would hardly order even more the next).

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[39] The new ordering of the estimates, from small (I) to large (C), is itself a methodological improvement, as in the presence of an overarching constraint as one moves from sector to sector the derivative errors tend thus to be reduced rather than magnified. An example may be clearer than an abstract explanation. Imagine that $C + I = 100$, and that our direct estimates of C and I will be off by 8 percent. Say $C = 75$ and $I = 25$. If we estimate C first, and get 69, $I = 100 - C = 31$: the 8 percent error in C yields a 24 percent error in I. If instead we estimate I first, and get 27, $C = 100 - I = 73$: the 8 percent error in I yields a less-than-3 percent error in C.

Here, fixed investment I_f is estimated directly, using the algorithm described above, and total investment is derived by adding a separate estimate of inventory investment that serves essentially to smooth consumption (not least of agricultural products, to the extent that harvest fluctuations were not absorbed by international trade). The decomposition of the joint residual $C + I_i$ is obtained in two steps. To allow for the normal growth of inventories as the economy grows, estimates of production-and-distribution inventory investment I_{ipd} are derived as fractions of the annual change in (mining and manufacturing) production on the one hand and the volume of goods handled by merchants on the other. The net residual $C + I_i - I_{ipd}$ is then smoothed by taking a five-year moving average with triangular weights; the smoothed values are identified with consumption C, the residuals with consumption-smoothing inventory investment I_{ics}. Total inventory investment I_i is then obtained as $I_{ipd} + I_{ics}$, and total investment I as $I_i + I_f$.

The revised 1911-price expenditure-side estimates are collected in Table 4 and illustrated, with their predecessors, in Figure 5. To start from the minor items, the revised series for exports, now also corrected to constant borders, essentially confirms Baffigi's. In the case of imports, on the other hand, Baffigi's series seems marked, as noted, by an overstated 1871 benchmark (above, §2.4); the revised series tends to confirm the present author's earlier estimates (save in 1861–66, due to the new allowances for Venetian imports, and for naval vessels the trade statistics omitted). The revised public-consumption series resembles neither of its predecessors; it resembles rather the extensively revised "public administration" production estimates, from which it is derived.

The new fixed investment series essentially confirms the author's 2012 series; arguably, in the light of the sources, as well as of the methodology, it could not do much else. The new total-investment series is a noisy version of the fixed-investment series: very noisy, because the estimated "inventory investment" movements are essentially the residuals from smoothing consumption, almost an order of magnitude greater than investment.

Because the minor series are minor, and the investment series is little changed, the reduction in the production-side estimate of GDP shows up essentially in the estimates of consumption, now significantly lower than the author's earlier estimates (and, *a fortiori*, Baffigi's) – and, by construction, perceptibly smoother. As already noted, however, the reduction is essentially in the quantity of distribution services associated with the consumption of commodities; the latter is not reduced, and neither, therefore, are implied living standards.

The revision of the expenditure side thus yields, in the main, an advance on one front, and a retreat on another. The advance concerns private consumption: it too, like GDP, is revised downward. The retreat concerns investment: the step-wise growth attributed to investment by the sesquicentennial series is a figment generated by unfortunate algorithms, and the earlier view that investment followed a (Kuznets-cycle) long swing is emphatically reaffirmed.

3.3 The composition of investment

Following Baffigi where I had feared to tread, the present revised second-generation estimates are extended to investigate the composition of investment; but his categories are here modified, the better to highlight the distinction between infrastructure and business investment. Because compositions are ultimately meaningful only at current prices, the 1911-

price estimates are accompanied by conjectural third-generation figures, at the 1911 price level and (approximate) current relative prices (Tables 5, 6 and Figures 6, 7).[40]

The exercise is non-trivial, as it requires in essence the decomposition of durable-goods production to distinguish final from intermediate goods, but in the light of our ultimate objectives very much worthwhile. We reconstruct the past to understand it, to explain to our satisfaction *why* things went the way they did; and because we are easily satisfied the literature is full of interpretations ("hypotheses," but that is just a trope) based on broad evidence that certainly admits them, but as readily admits alternatives. To narrow the field we must look beyond, or more precisely within, the broad aggregates with which we too often rest content, to verify that the story we tell is consistent with finer-grained evidence; and if we are concerned with economic development our focus must be not on aggregate domestic product (which can grow for a spell thanks to no more than favorable weather) but on capital formation, on investment – and by the same token not on aggregate investment (which can be in palaces and amusement parks as well as in means of production), but on its various components. The desired disaggregation is of course by destination, distinguishing for example investment in agriculture, and investment in industry; the present figures are limited to a partial (but, as a first step, necessary) disaggregation by instrument, distinguishing for example investment in structures, and investment in machinery. *Est tempus in rebus.*[41]

The new second-generation, 1911-price estimates of the components of investment are obtained as follows. As recalled above, aggregate fixed investment was estimated from the value added in the production of final and intermediate investment goods, rather than directly from the value of the final investment goods, because only a subset of the latter can be identified: to the best of our knowledge no evidence directly documents the distribution of significant products – notably those of the (overwhelmingly artisanal) wood-working and hardware industries – between final goods in their own right (e.g., tools, wood machines) and goods incorporated in the product of other industries (e.g., wood doors and windows, or metal gates and blinds, incorporated in structures).

Here, the 1911-price fixed-investment aggregate is accordingly disaggregated into its various directly identifiable components, tentatively converted from f.o.b. (factory-gate) to c.i.f. (delivered) values, and a residual taken as an estimate of the unobservable (c.i.f.) value of the final goods of wood and fabricated metal, essentially tools and wood machinery – a very rough estimate, inevitably, as this residual inherits all the errors of its parent figures. These estimates reaffirm the long-established presence of a long swing in investment in infrastructure, and the recently-established *absence* of that swing in investment in ordinary (industrial and agricultural) metal machinery (Fenoaltea 2017b, Pezzuto 2017). The novel result is that investment in tools (and wood machinery) also apparently followed the familiar

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[40] For what appear to be sufficient reasons (Fenoaltea 2020), the present estimates of fixed investment include maintenance; but maintenance is separately identified, not least to facilitate comparisons with the maintenance-excluding estimates in the extant literature (e.g., Vitali in Rey 1992, pp. 314−315; Baffigi 2011, p. 63, with reference to his investment-in-construction series).

[41] A more ambitious disaggregation of investment, by type (housing, public works, machinery and vehicles, non-residential structures, other) and by destination (housing, agriculture, industry and services, public infrastructure) appears in Fuà (1969); but the underlying ("first-generation") estimates are so poor that these figures are of little use.

long swing, with super-normal growth over most of the 1880s, a decline into the early '90s, and renewed growth from the turn of the century (Table 5 and Figure 6).[42]

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

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

What emerges on this approximate current-relative-price basis is collected in Table 6 and illustrated in Figure 7; the salient results can be summarized as follows.[43] First, the ratio of investment in new goods to investment in maintenance varied of course as new investment followed the long swing, and maintenance did not; cyclical variations apart, that ratio appears essentially to have remained stable, near 3 to 1. Within investment in new goods, the share of precious-metal display goods was trivial, declining from perhaps one percent to less than half that. Of the significant components of investment in new goods, agricultural improvements and breeding varied most: their share was typically in the 5-to-15 percent range, but with a maximum approaching 20 percent in 1878 and 1879, and near-zero minima in 1889 and 1899. The share of private structures was normally in the 10-to-15 percent range, but with a peaks approaching 20 percent in 1874 and not much less than that in 1904−05 and again in 1911−13. The share of other infrastructure, ships, and trains drifted down, with cyclical variations, from 40 to 50 percent in the early years to a minimum of 20 percent in 1896, and then recovered to some 30 percent by 1913. The share of (metal) machinery grew relatively steadily from some 5 percent at Unification to a peak of some 30 percent in 1908, and then fell back to nearer 20 percent by 1913. The share of tools (and wood machinery), finally, appears to have remained between 30 and 40 percent through the nineteenth century, and then to have drifted down to nearer 25 percent: figures that are large, but perhaps not surprisingly so, in a country that was and largely remained a land of artisans and cultivators.

Figure 7 also illustrates the relative shares, in their joint total, of productivity-enhancing new-good investment in "infrastructure" (public works and vehicles, Table 6, cols.

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[42] This point is in part *sub judice*, as the wood-industry value added series is preliminary; the extant estimates incorporate lumber-import quantity data for the late 1880s that may be overstated by a factor of 10, artificially inflating estimated production – and, derivatively, estimated investment in tools and wood machinery – over those years. The late-1880s spike may well be overstated, but the long-swing story itself seems robust.

[43] Figure 7 also illustrates the purported composition of investment at 1911 prices, highlighting the attendant distortions.

5 and 7, excluding however naval ships), "machinery" (ibid., col. 8), and "tools" (including wood machinery, ibid., col. 9). "Tools" were overall the largest single component, "infrastructure," through the turn of the century, a close second; "machinery" started a distant third but grew to capture a solid first place over the halcyon years of the prewar boom, and by 1913 the shares of these three components were roughly equivalent.

Some implications for the literature may usefully be spelled out, by way of conclusion.

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

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

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

How might Romeo have shaped his account, had he had in his hands the evidence and estimates presented here? If one takes the changing composition of investment as a guide to *when* the prerequisites were in place and industry could "take off," the present estimates point to the mid-1890s, as Gerschenkron had argued; but Romeo could have salvaged the rest of his story, as the expansion of the railway net actually came to an end right about then (Fenoaltea 2011a, p. 171).

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

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Figure 1

Per-capita income at 1911 prices, Italy, 1861-1913: alternative estimates (lire)
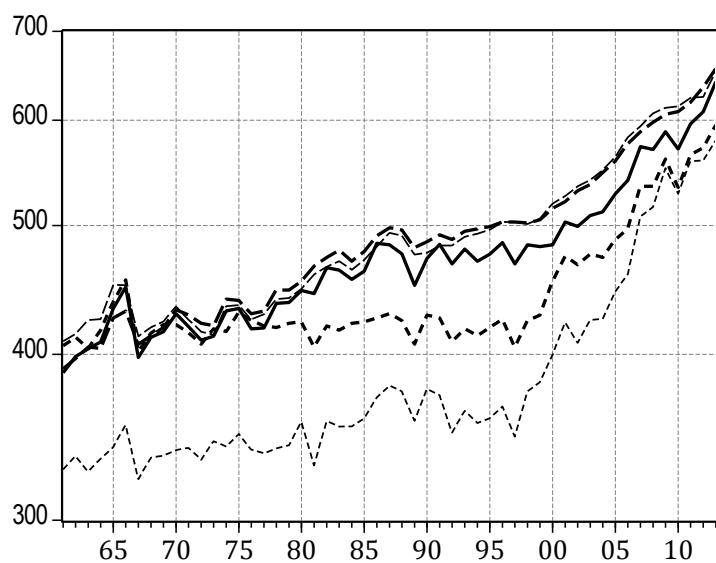
- - - - first-generation estimates (Istat-Vitali 1969)
- - - - Maddison estimates (1991)
— — preliminary second-generation estimates (2005)
— — sesquicentenary estimates (Baffigi 2011)
——— revised second-generation estimates

Figure 2
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
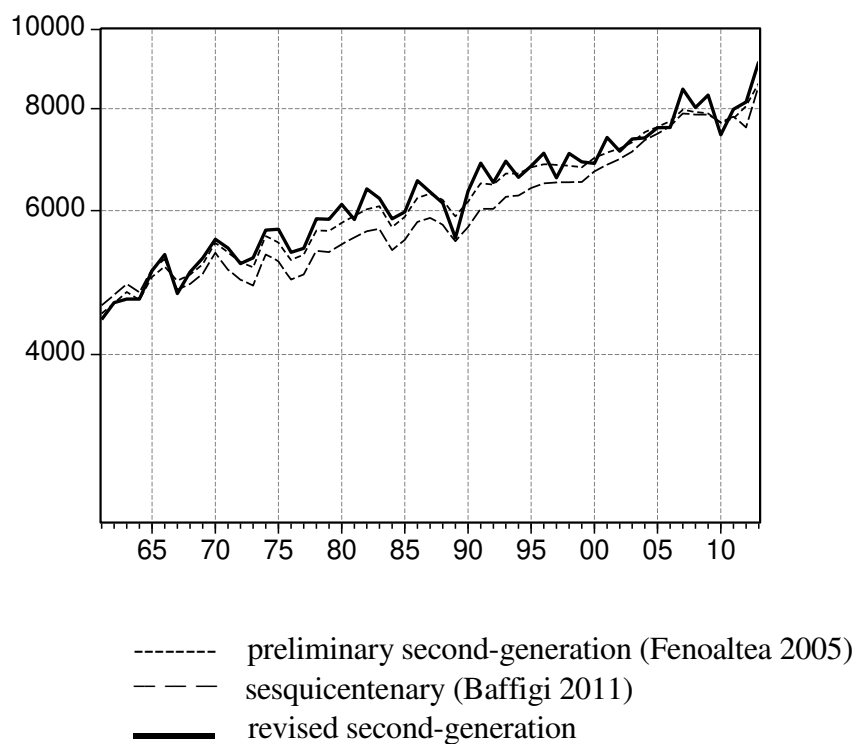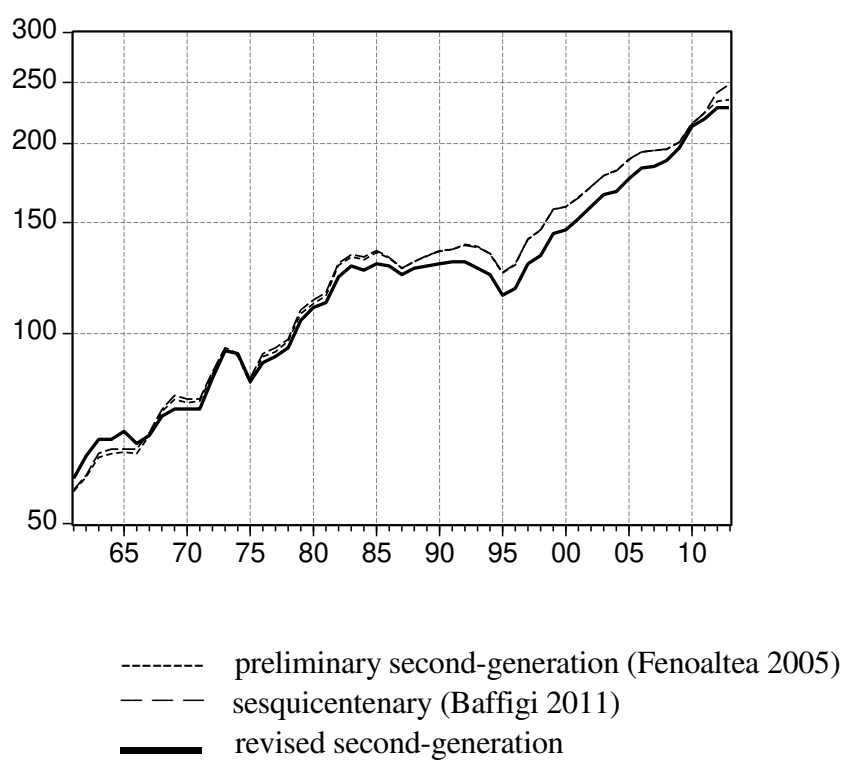
Figure 2, continued

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
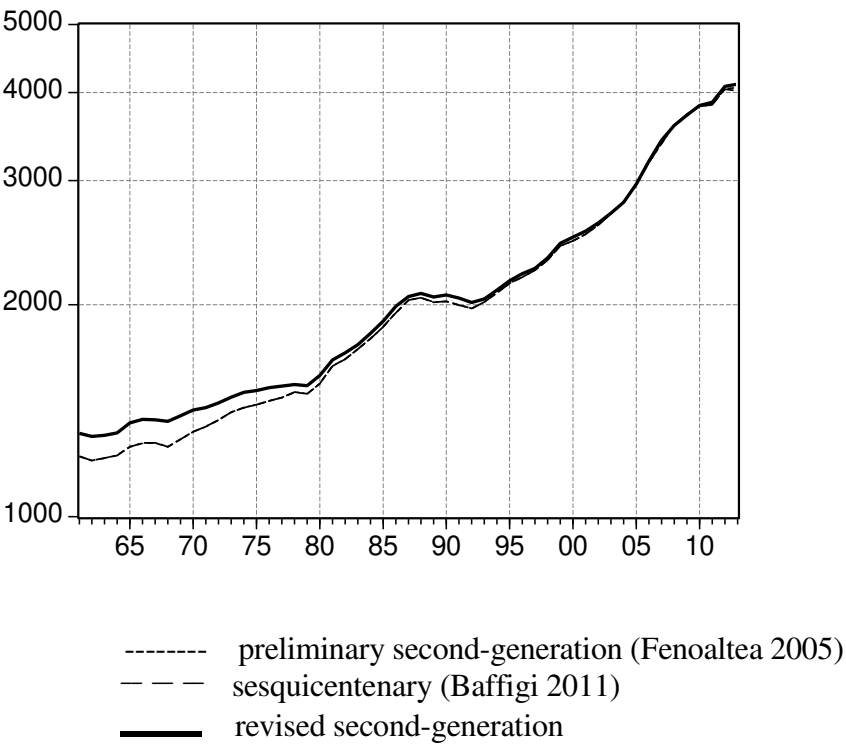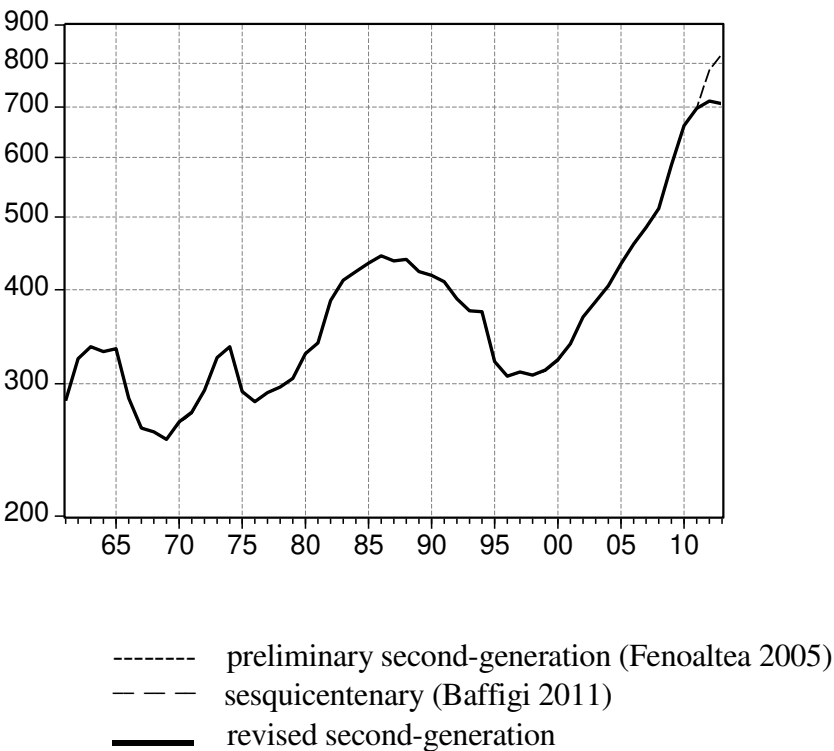
Figure 2, continued

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
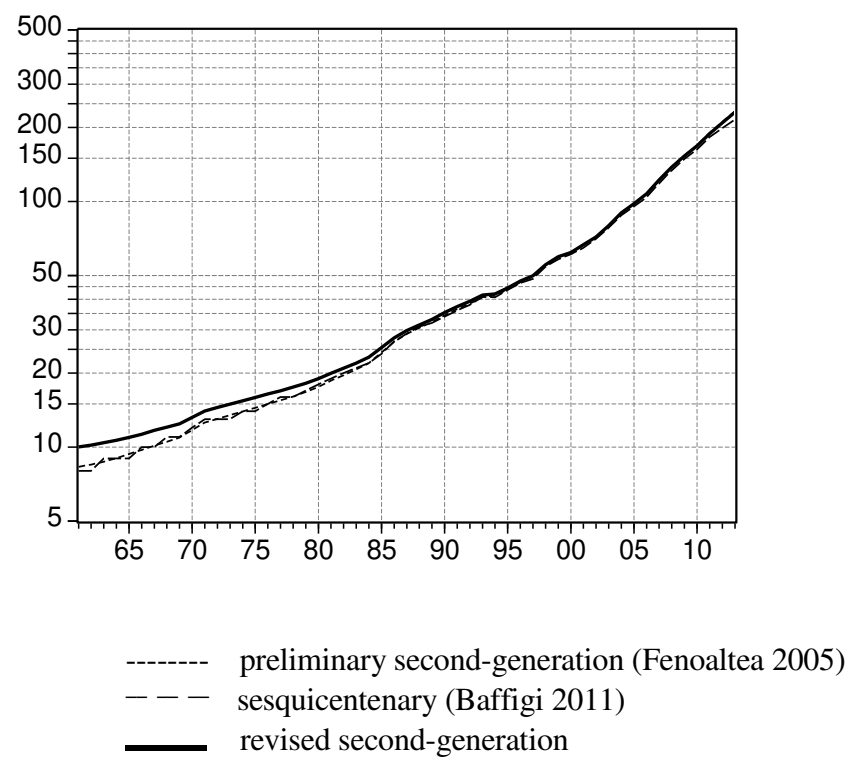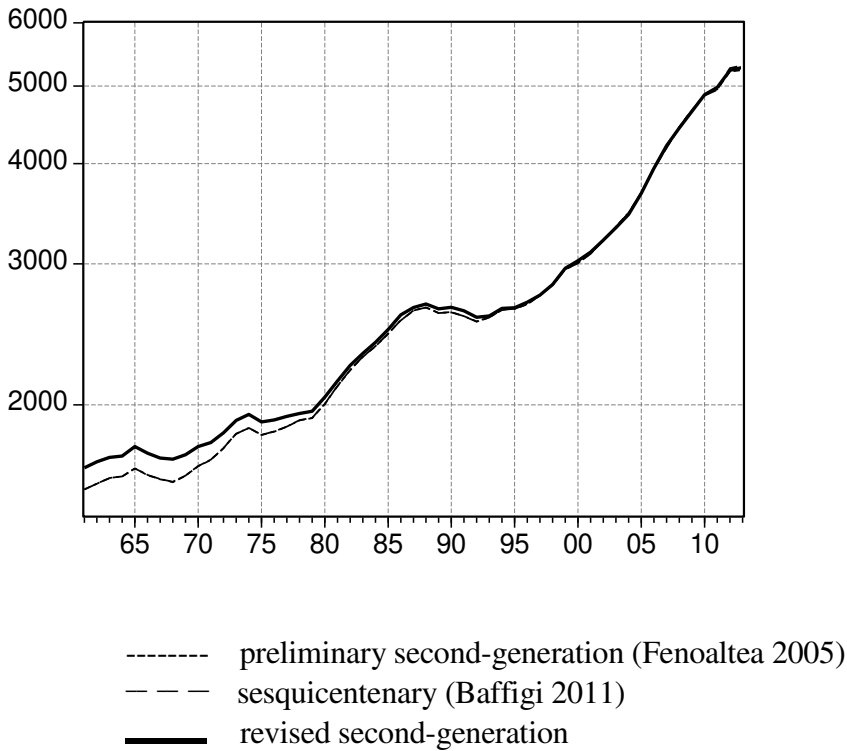
Figure 2, continued

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
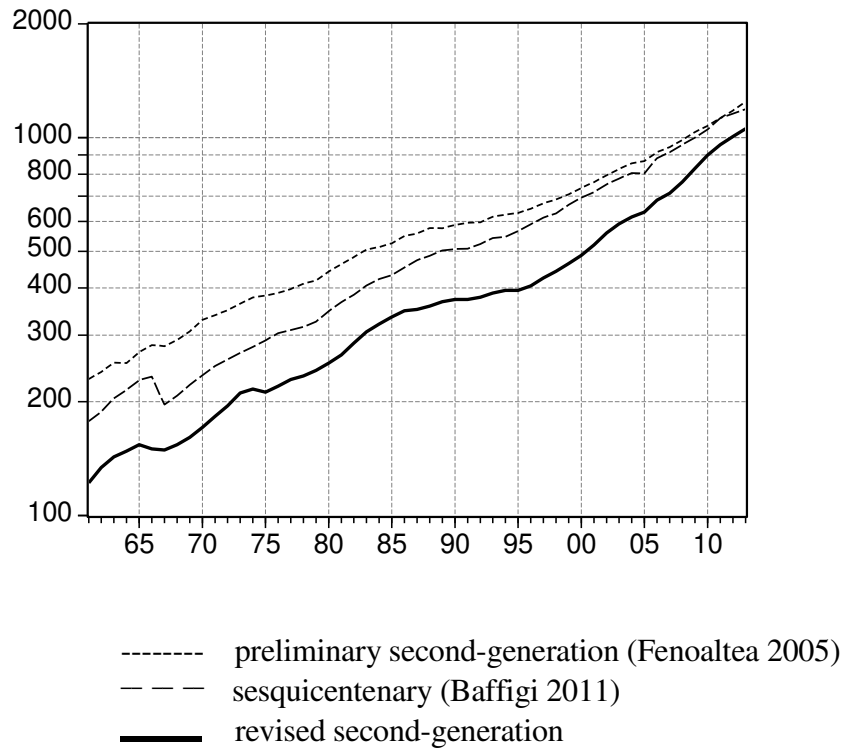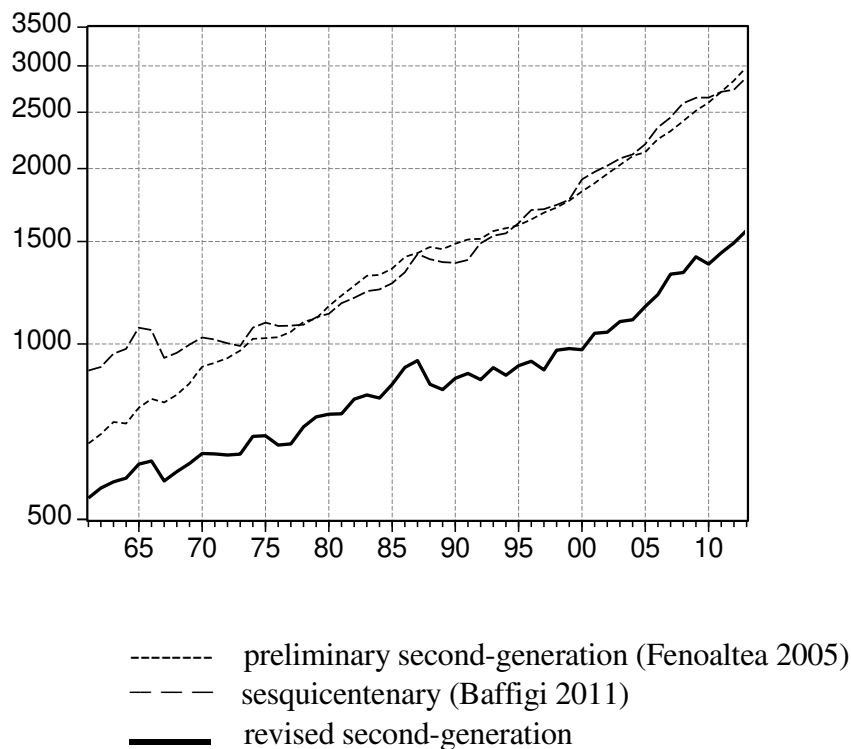
Figure 2, continued

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
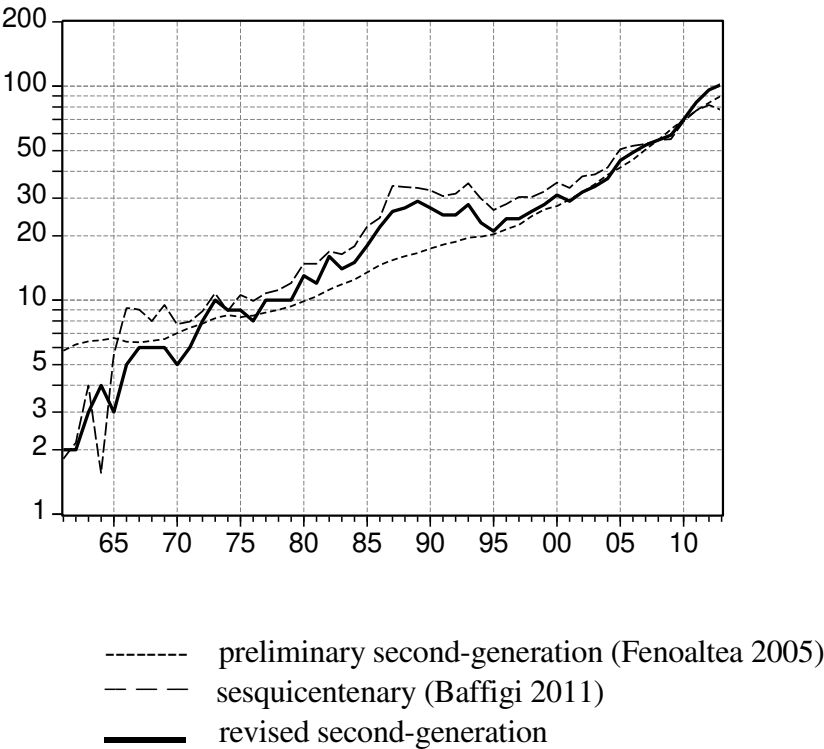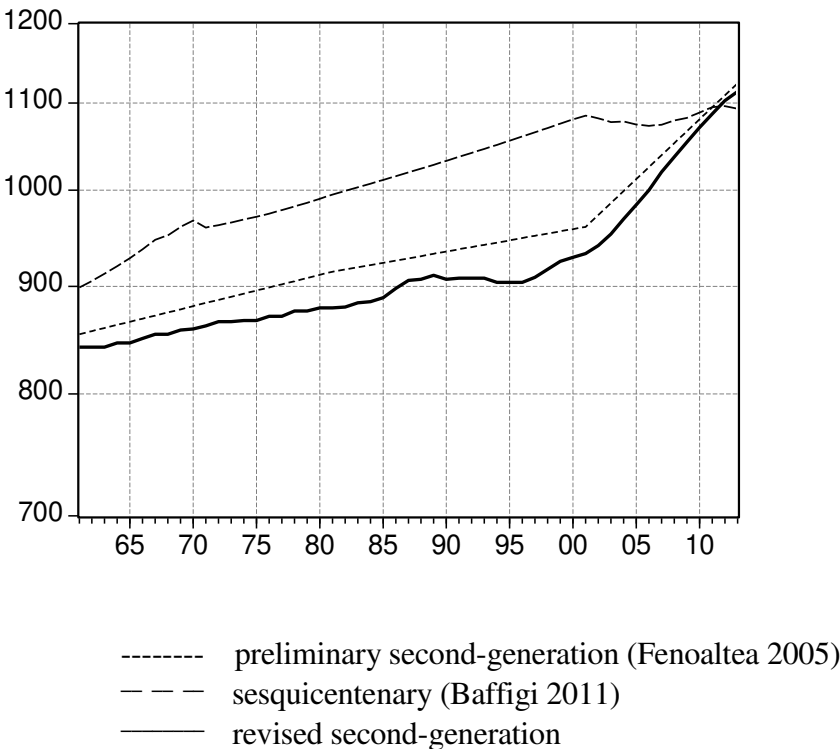
Figure 2, continued

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
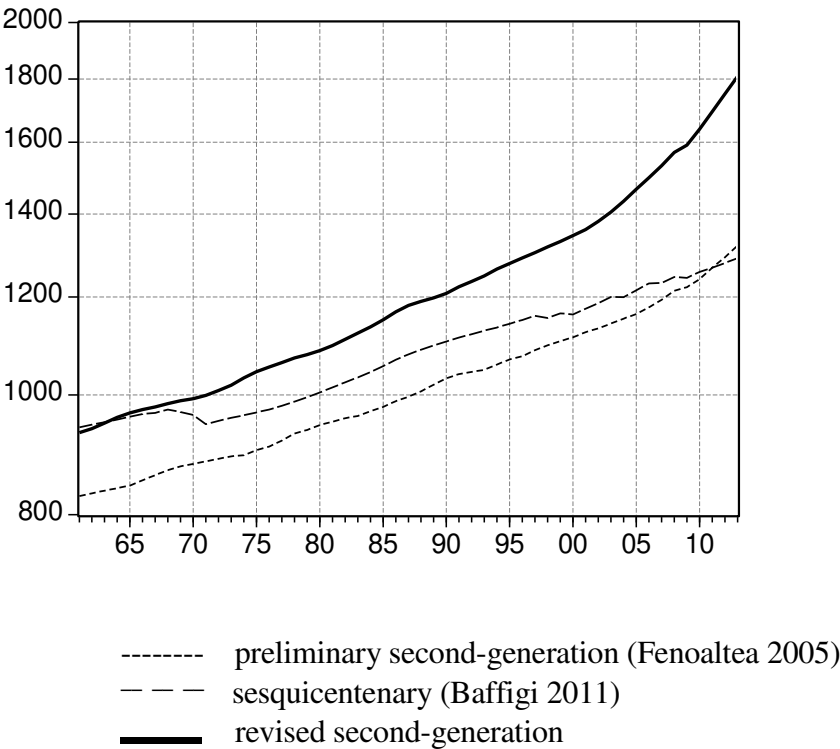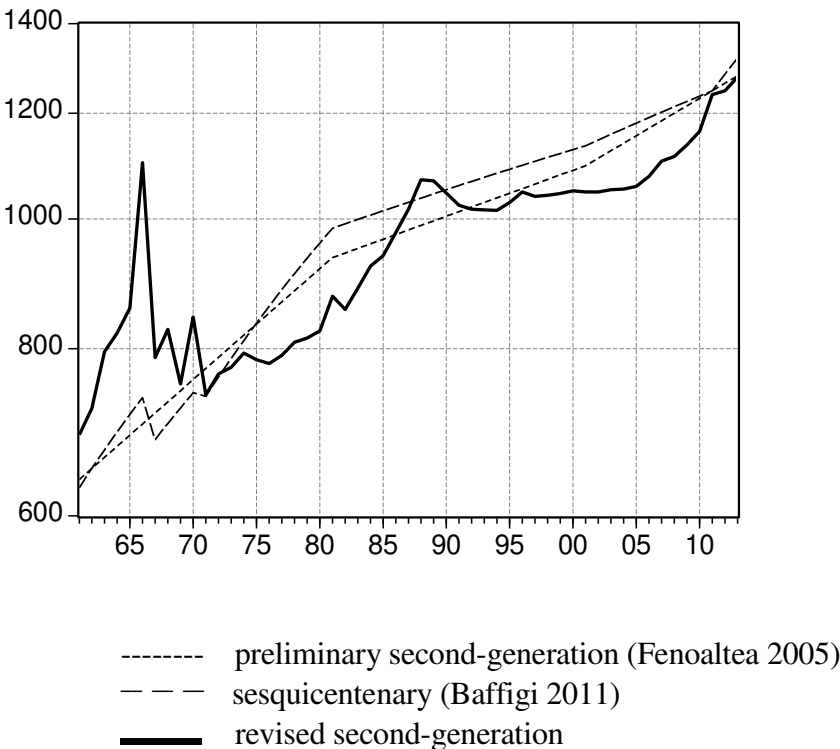
Figure 2, continued

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 2, continued

E. GDP


```
----------   preliminary second-generation (Fenoaltea 2005)
─ ─ ─        sesquicentenary (Baffigi 2011)
━━━━━        revised second-generation
```
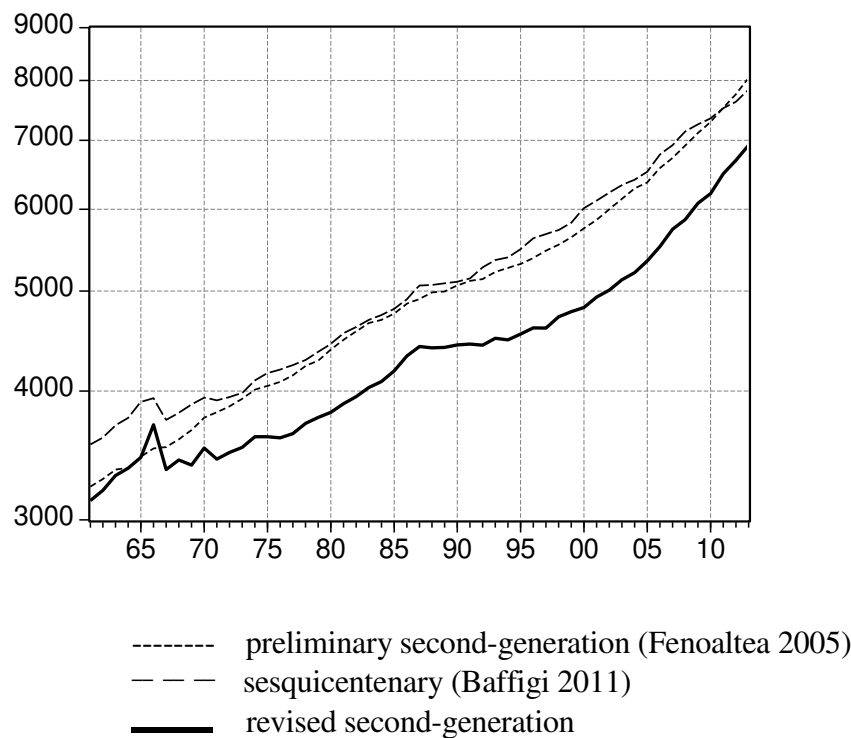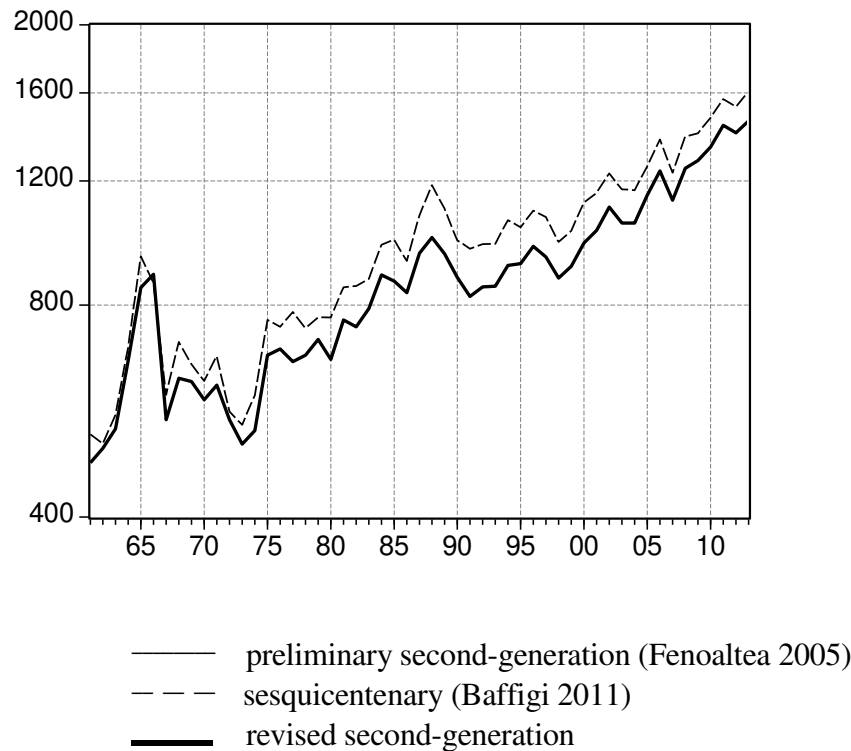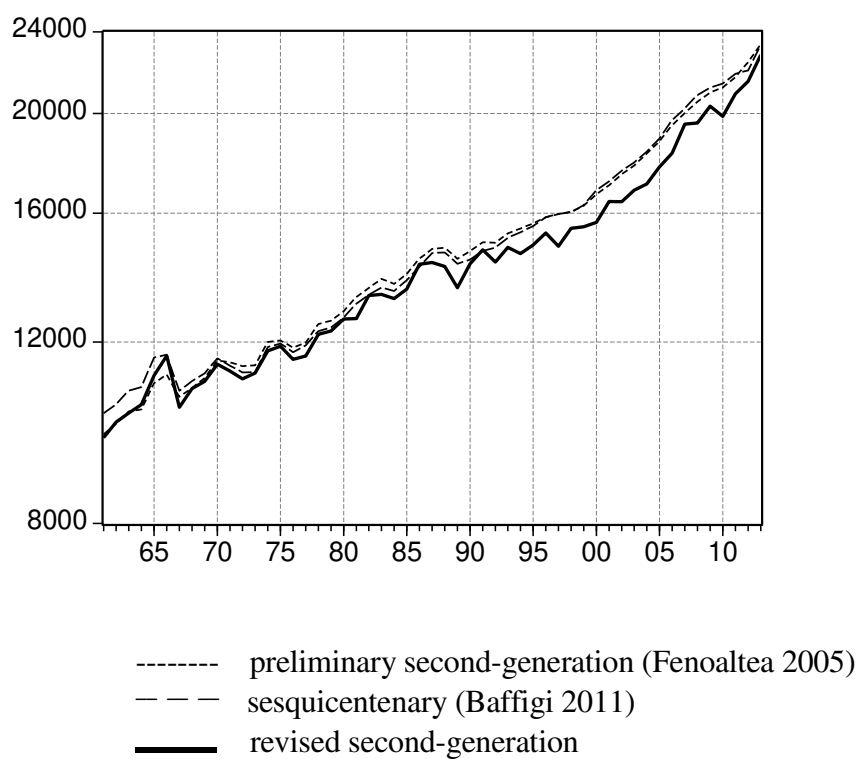
F. Gross domestic product: ratio of revised estimates to the previous estimates


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─────        ratio to preliminary second-generation (Fenoaltea 2005)
─ ─ ─        ratio to sesquicentenary (Baffigi 2011)
```
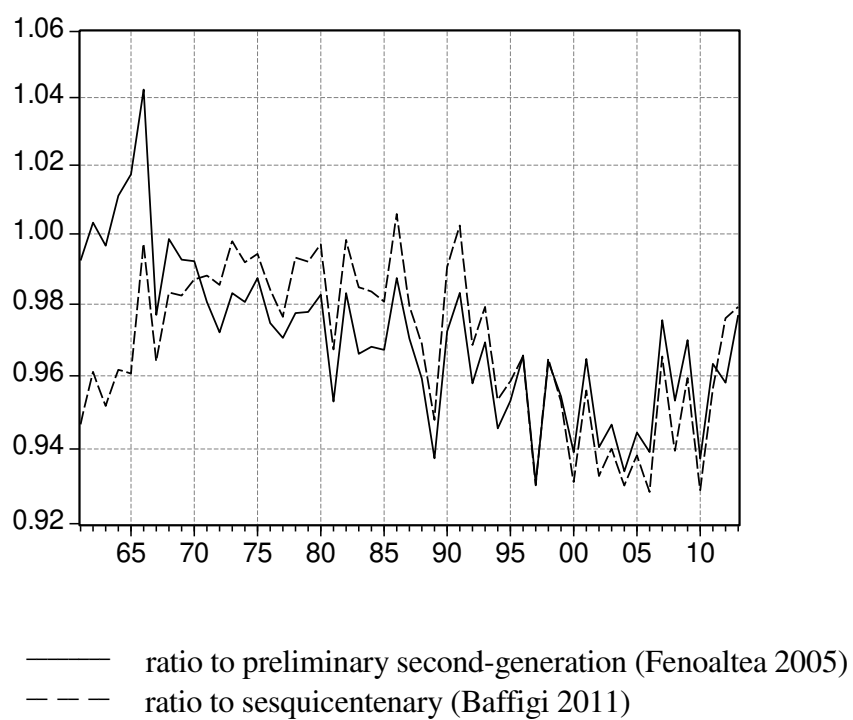
Figure 2, continued

G. Gross domestic product: major-sector paths

| | agriculture | | services | | industry |
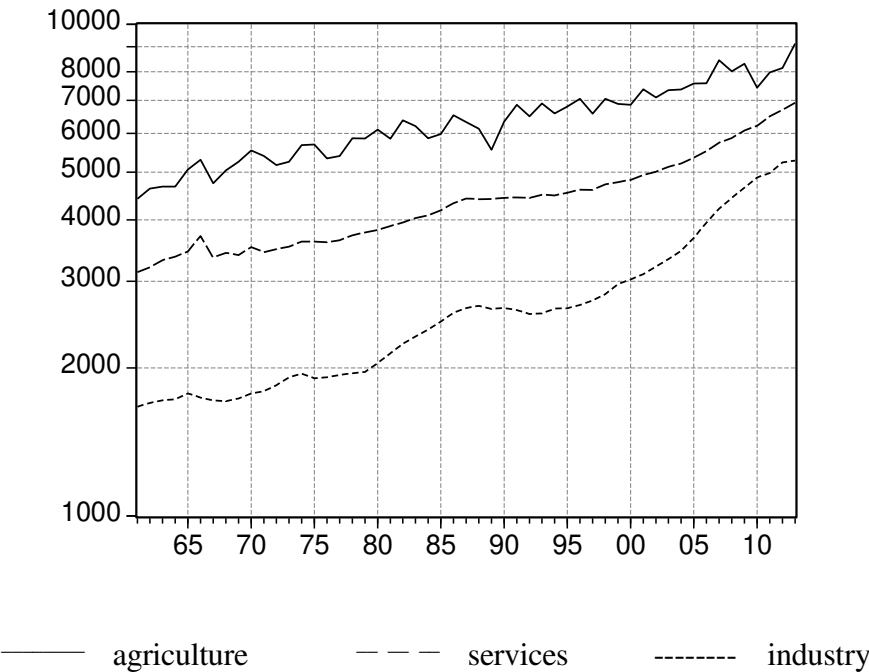
H. Gross domestic product: major-sector growth rates (percent)

| | agriculture | | industry | | services |
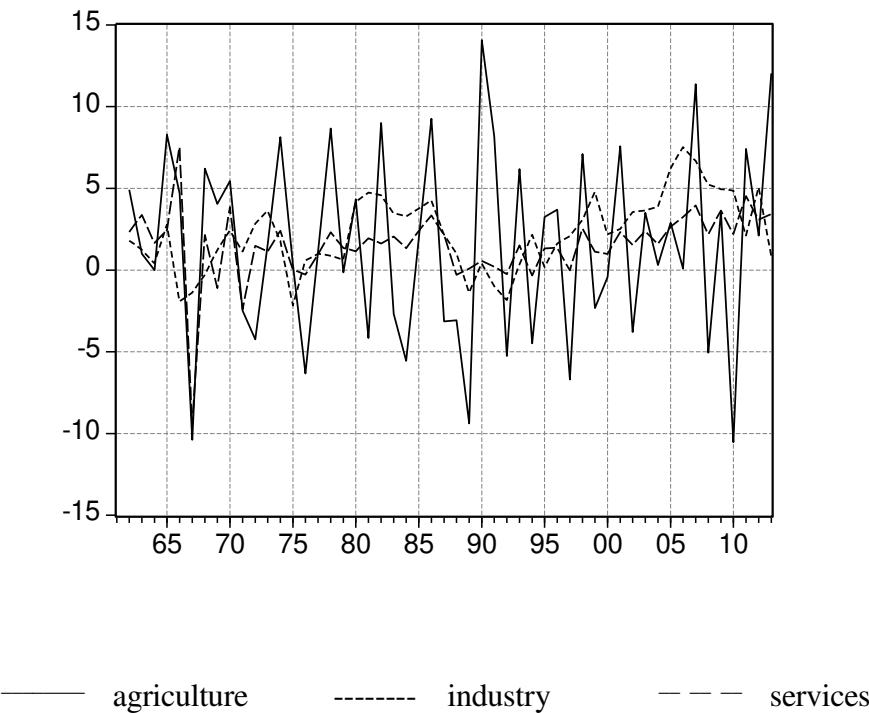
Figure 3

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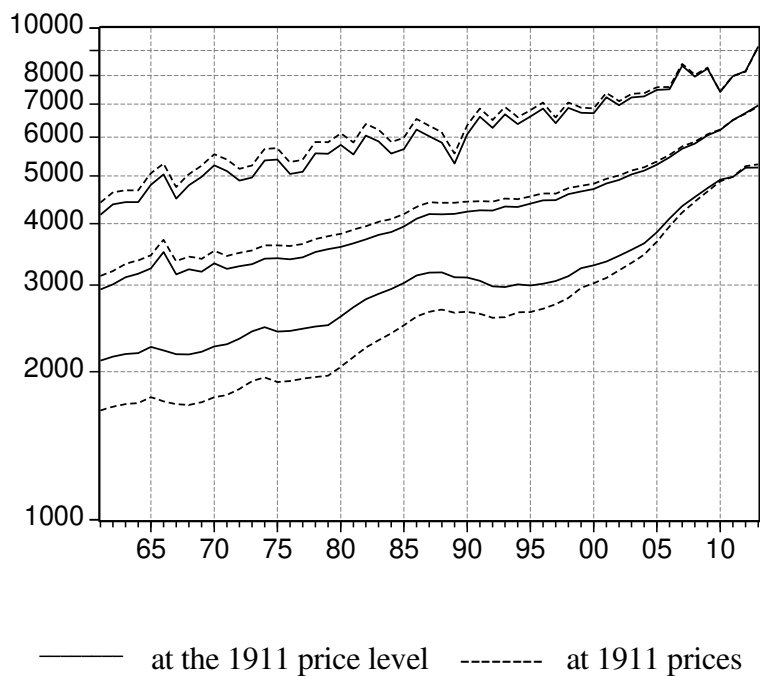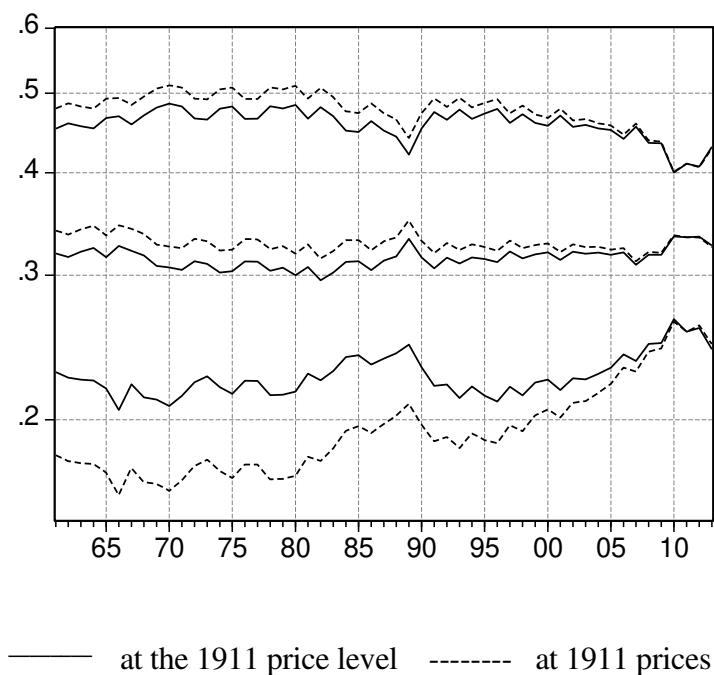
*the top pair of lines refer to agriculture, the middle two to services, the bottom two to industry

Figure 4

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*
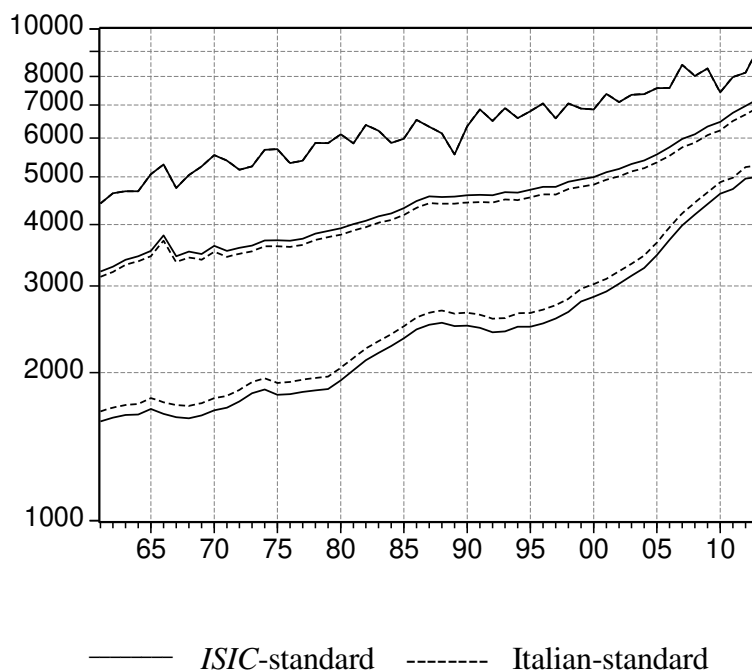
———— *ISIC*-standard   -------- Italian-standard
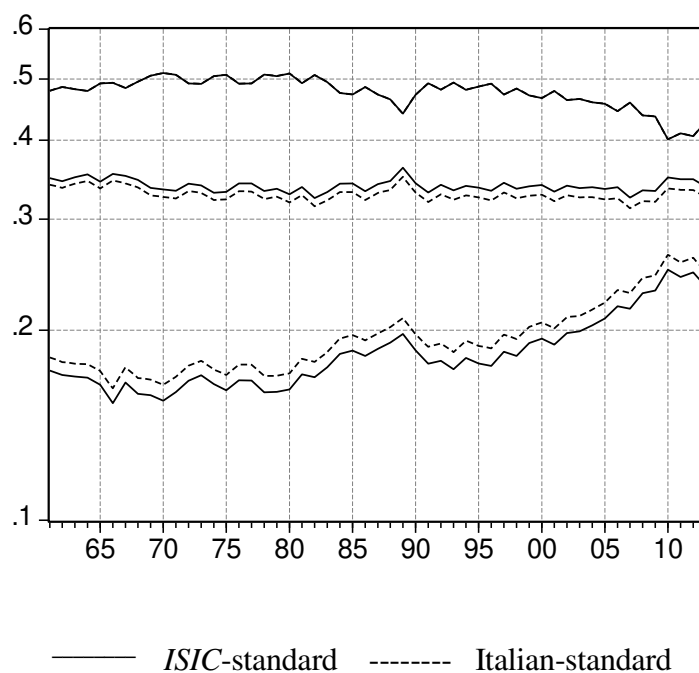
*the top line refers to agriculture, the middle two to services, the bottom two to industry

Figure 5
Expenditure series at 1911 prices, 1861–1913 (million lire)

A. Consumption

--------   preliminary second-generation (Fenoaltea 2012)
— — —   sesquicentenary (Baffigi 2011)
━━━   revised second-generation

B. Fixed investment

--------   preliminary second-generation (Fenoaltea 2012)
— — —   sesquicentenary (Baffigi 2011)
━━━   revised second-generation
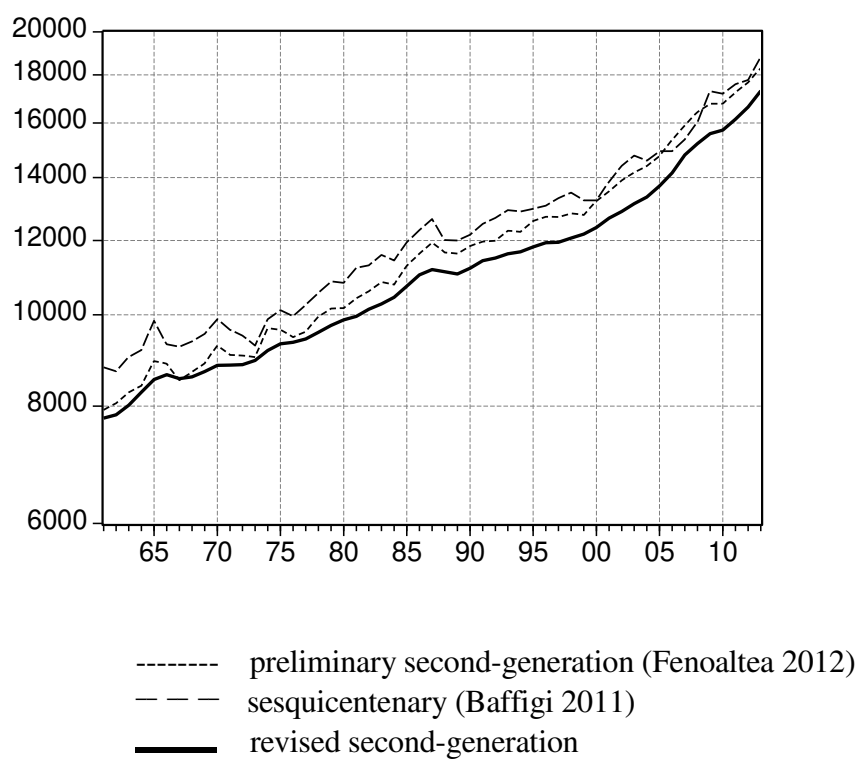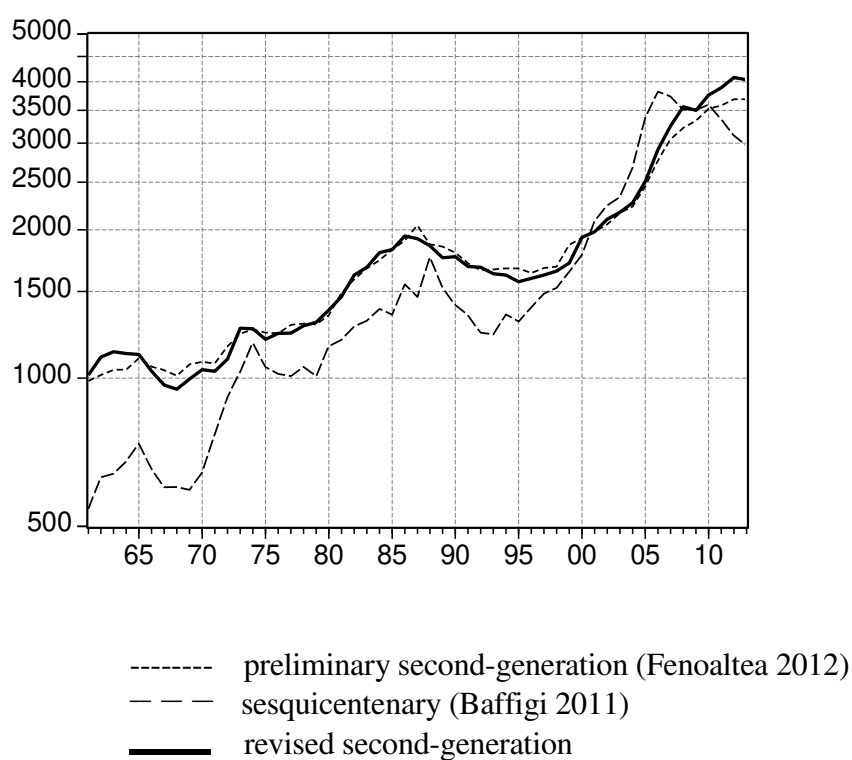
Figure 5, continued

C.   Investment (total)

- - -   sesquicentenary (Baffigi 2011)
⎯⎯   revised second-generation

D.   Government

········   preliminary second-generation (Fenoaltea 2012)
- - -   sesquicentenary (Baffigi 2011)
⎯⎯   revised second-generation
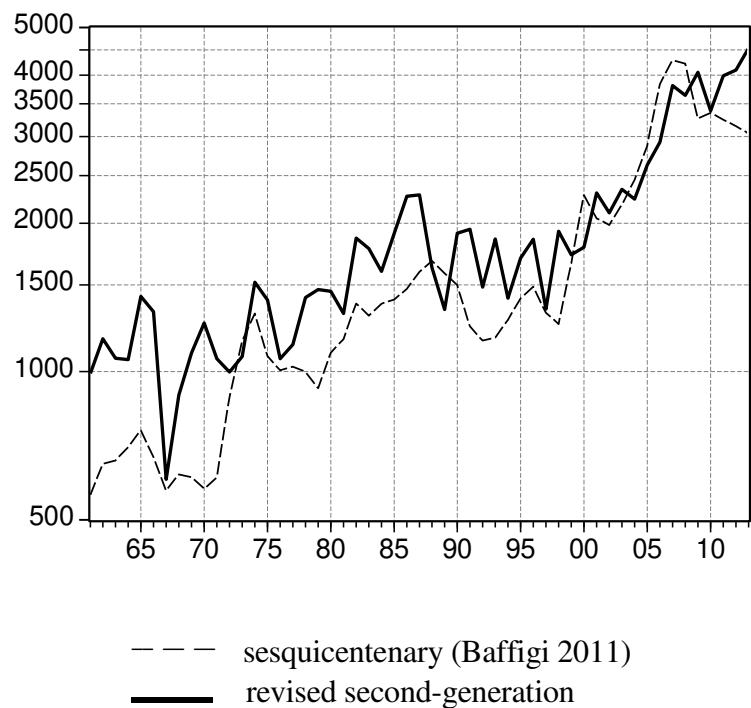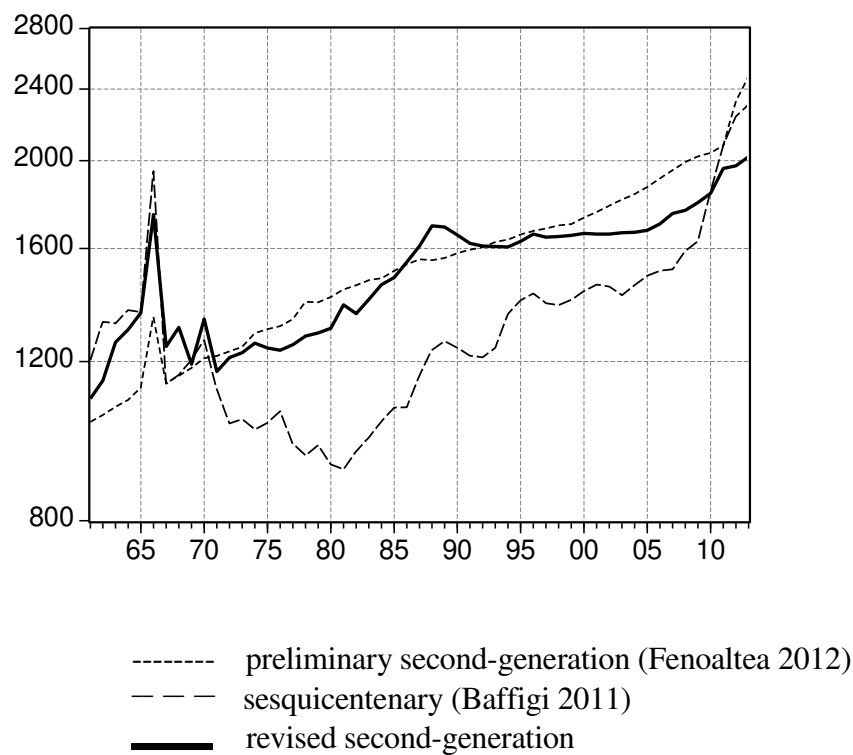
Figure 5, continued

E. Exports

-------- preliminary second-generation (Fenoaltea 2012)
─ ─ ─ sesquicentenary (Baffigi 2011)
revised second-generation

F. Imports

-------- preliminary second-generation (Fenoaltea 2012)
─ ─ ─ sesquicentenary (Baffigi 2011)
revised second-generation
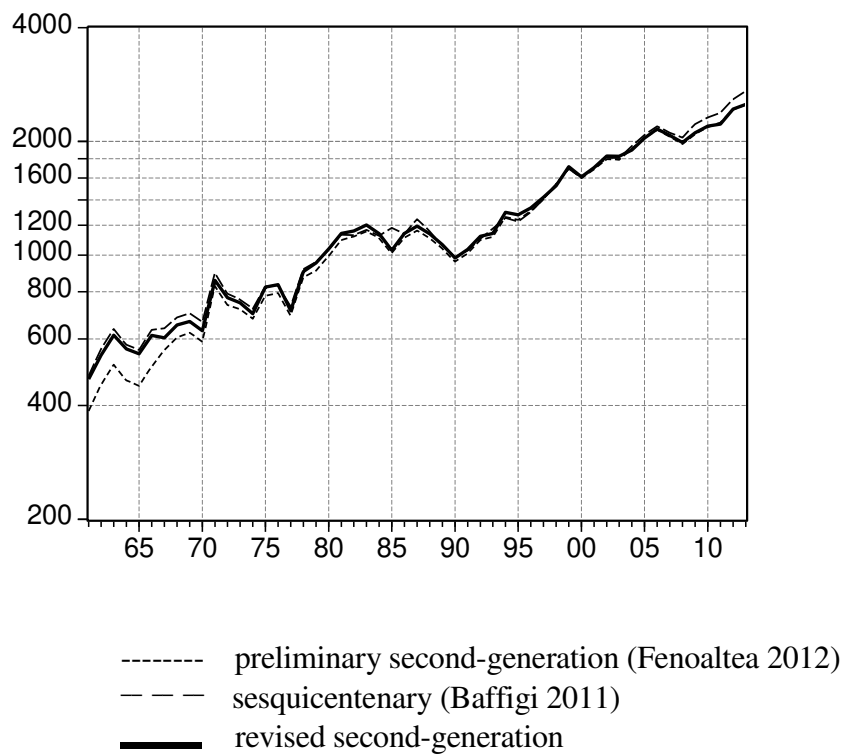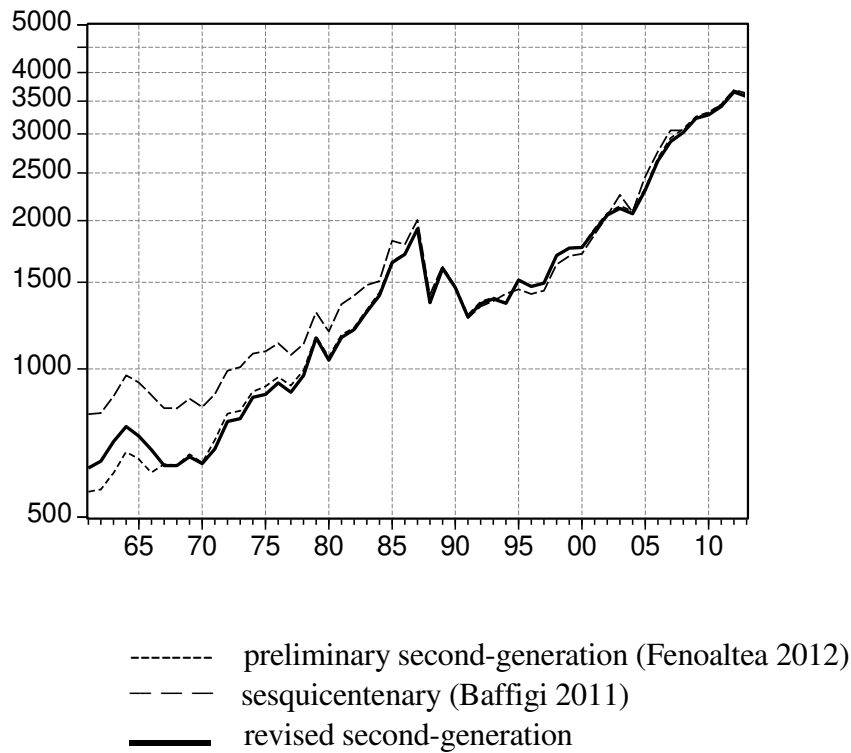
Figure 6
Components of investment at 1911 c.i.f. prices, 1861–1913 (million lire)

A. Aggregate investment

A1. Maintenance
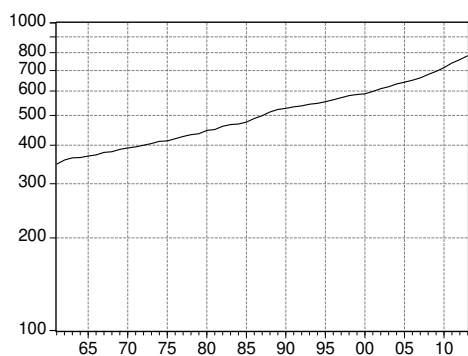
A2. New-good investment
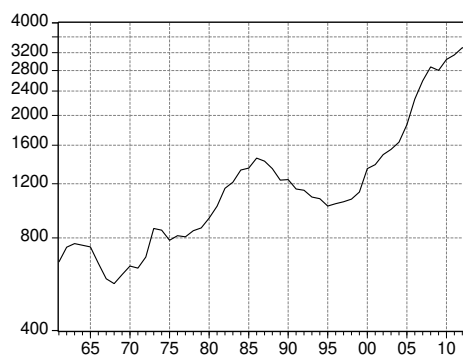
B. New-good investment

B1. By and in agriculture
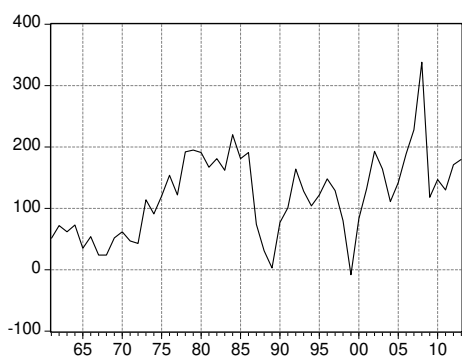
B2. Private structures
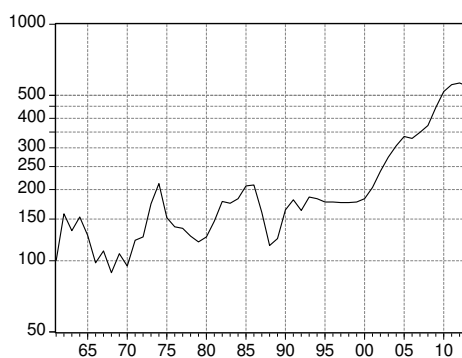
B3. Other fixed infrastructure
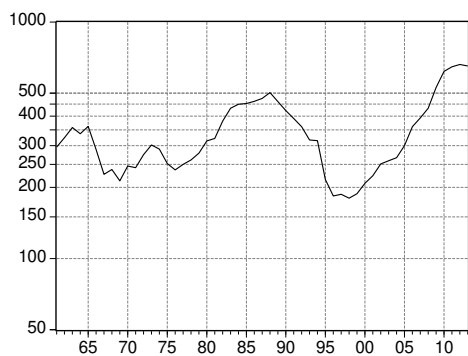
B4. Vehicles, horses, harnesses
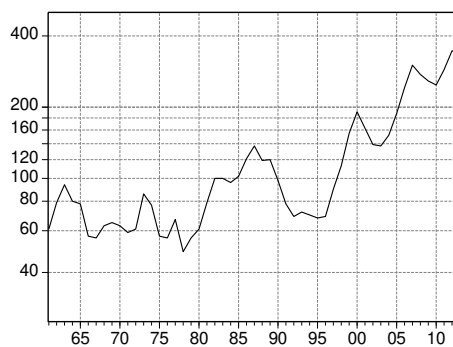
Figure 6, continued

B5. Metal (ordinary/precision) machinery   ### B6. Tools, wood machinery
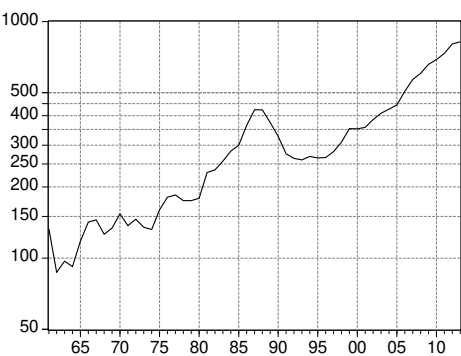
B7. Precious-metalware
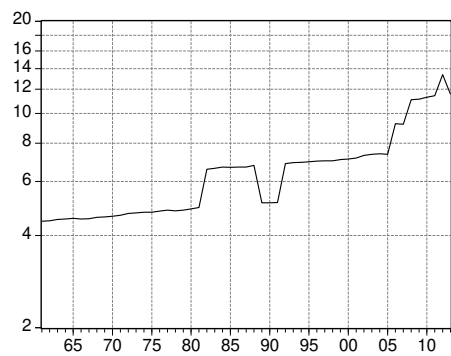
Figure 7

Conjectural composition of investment at the 1911 price level, 1861–1913

A. Share of new-product investment in aggregate investment
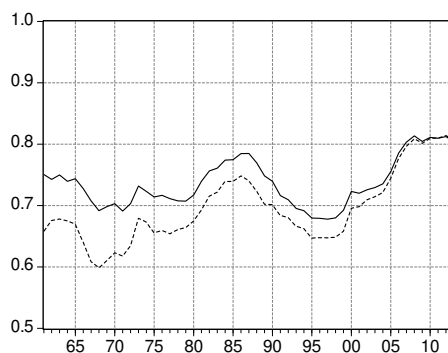
————— share at approximate current prices   - - - - - - share at 1911 prices

B. Shares of new-product investment

B1. By and in agriculture   B2. Private structures
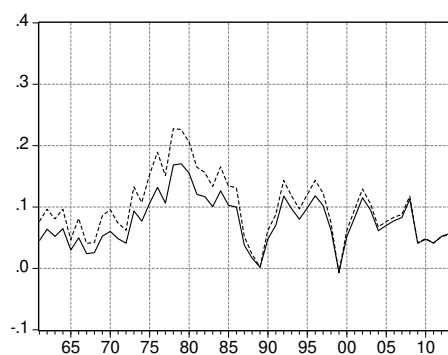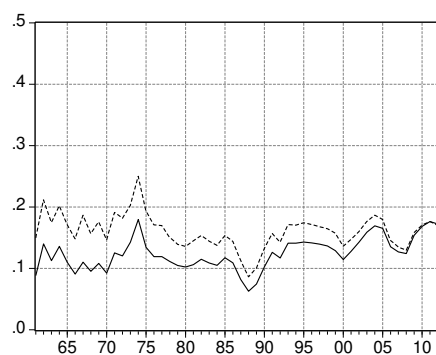
B3. Other fixed infrastructure   B4. Vehicles, horses, harnesses
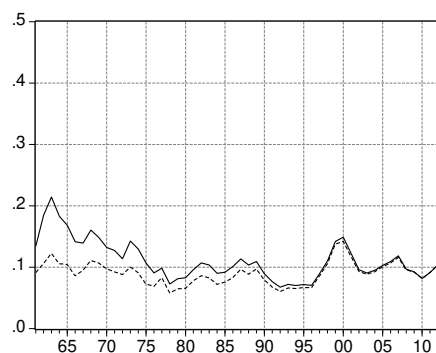
Figure 7, continued

B5. Metal (ordinary/precision) machinery   B6. Tools, wood machinery
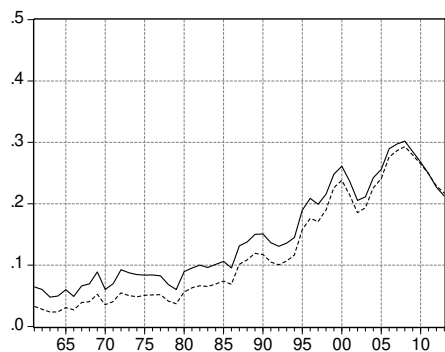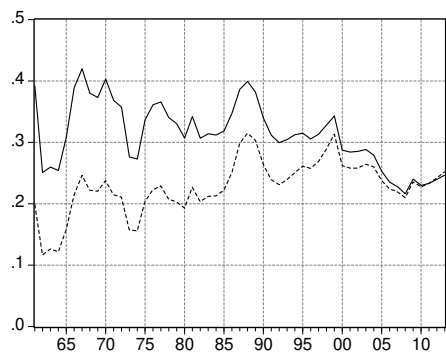
B7. Precious-metalware
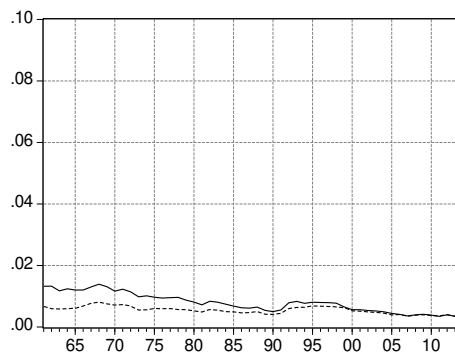
———— share at approximate current prices   -------- share at 1911 prices

C. Relative shares of productivity-enhancing investment, 1861–1913
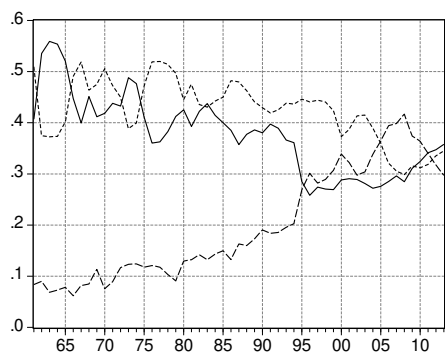
———— public infrastructure, merchant ships, rolling stock
-------- tools, wood machinery
— — — metal (ordinary/precision) machinery

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

	(1) value added in agri- culture vintage: **2019** quality: 2	(2) extrac- tive **2015** 4	(3)	(4)	(5) value added in industry manufacturing	(6)	(7)	(8)	(9)
			food 2003 1	tobacco 2003 1	textiles 2003 4	apparel 2003 4	leather **2019** 4	wood 2003 2	metal **2015** 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

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
				value added in industry (cont.)					
			manufacturing (cont.)						
	engi-	non-met.	chem.,	paper,	sundry	total	construc-	utili-	total
	neer'g	min. pr.	rubber	printing	mfg.	mfg.	tion	ties	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

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	(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

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Source: see text.

Table 2. Revised 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. Revised 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. Revised expenditure series at 1911 prices, 1861-1913 (million lire)

	(1)	(2) I	(3)	(4)	(5)	(6)	(7)
	C	fixed	total	G	X	M	GDP
1861	7,766	1,015	992	1,092	470	629	9,691
1862	7,831	1,104	1,166	1,143	544	650	10,034
1863	8,016	1,131	1,064	1,260	614	712	10,242
1864	8,278	1,122	1,057	1,301	565	764	10,437
1865	8,537	1,117	1,421	1,358	548	730	11,134
1866	8,640	1,034	1,323	1,744	613	685	11,635
1867	8,554	968	604	1,247	604	636	10,373
1868	8,593	949	896	1,309	653	636	10,815
1869	8,707	996	1,091	1,192	668	663	10,995
1870	8,837	1,040	1,255	1,337	631	642	11,418
1871	8,843	1,033	1,062	1,170	857	688	11,244
1872	8,851	1,093	998	1,212	772	782	11,051
1873	8,942	1,263	1,073	1,227	748	793	11,197
1874	9,166	1,260	1,519	1,257	700	876	11,766
1875	9,316	1,199	1,397	1,242	823	888	11,890
1876	9,350	1,233	1,062	1,235	835	937	11,545
1877	9,428	1,234	1,135	1,252	712	897	11,630
1878	9,582	1,277	1,414	1,280	905	969	12,212
1879	9,747	1,298	1,467	1,290	954	1,156	12,302
1880	9,877	1,375	1,455	1,306	1,039	1,042	12,635
1881	9,964	1,464	1,312	1,386	1,141	1,159	12,644
1882	10,138	1,620	1,866	1,355	1,159	1,203	13,315
1883	10,272	1,680	1,777	1,405	1,201	1,306	13,349
1884	10,440	1,799	1,598	1,459	1,140	1,411	13,226
1885	10,730	1,825	1,907	1,486	1,030	1,644	13,509
1886	11,028	1,943	2,270	1,546	1,141	1,709	14,276
1887	11,172	1,920	2,285	1,610	1,194	1,925	14,336
1888	11,111	1,857	1,626	1,694	1,138	1,363	14,206
1889	11,054	1,756	1,336	1,690	1,066	1,600	13,546
1890	11,209	1,765	1,910	1,656	982	1,463	14,294
1891	11,416	1,686	1,946	1,621	1,035	1,275	14,743
1892	11,491	1,680	1,484	1,610	1,121	1,356	14,350
1893	11,610	1,630	1,858	1,608	1,141	1,388	14,829
1894	11,667	1,620	1,409	1,606	1,298	1,359	14,621
1895	11,811	1,569	1,701	1,629	1,279	1,516	14,904
1896	11,934	1,595	1,856	1,659	1,334	1,470	15,313
1897	11,948	1,620	1,339	1,646	1,423	1,493	14,863
1898	12,067	1,649	1,927	1,649	1,526	1,700	15,469
1899	12,190	1,712	1,727	1,654	1,715	1,759	15,527
1900	12,385	1,931	1,788	1,662	1,611	1,764	15,682
1901	12,670	1,982	2,306	1,659	1,704	1,909	16,430
1902	12,882	2,103	2,101	1,659	1,829	2,054	16,417
1903	13,128	2,171	2,345	1,665	1,827	2,119	16,846
1904	13,343	2,271	2,240	1,667	1,896	2,067	17,079
1905	13,713	2,507	2,627	1,675	2,039	2,309	17,745
1906	14,161	2,912	2,925	1,703	2,155	2,648	18,296
1907	14,792	3,255	3,809	1,749	2,073	2,895	19,528
1908	15,206	3,556	3,638	1,763	1,987	3,023	19,571
1909	15,588	3,498	4,053	1,798	2,108	3,226	20,321
1910	15,723	3,756	3,384	1,841	2,195	3,279	19,864
1911	16,143	3,888	3,986	1,961	2,221	3,413	20,898
1912	16,632	4,079	4,094	1,974	2,434	3,651	21,483
1913	17,306	4,037	4,539	2,021	2,505	3,577	22,794

Source: see text.

Table 5. Components of investment at 1911 c.i.f. prices, 1861-1913 (million lire)

	(1) inv. in maintenance	(2) total	(3) by and in ag.	(4) construction priv.	(5) construction pub.	(6) horses, harn's	(7) ships, r. veh.	(8) metal mach.	(9) tools, wood mach.	(10) display goods
				investment in new durable goods						
1861	347	668	51	100	296	22	39	22	133	4
1862	358	746	72	158	324	22	57	21	87	4
1863	364	767	62	134	358	20	74	18	97	5
1864	365	757	73	153	337	20	60	18	92	5
1865	369	748	35	128	362	20	58	23	118	5
1866	372	662	54	98	289	8	49	18	142	5
1867	379	589	24	110	227	12	44	23	145	5
1868	381	568	24	89	238	15	48	23	126	5
1869	388	608	52	107	213	18	47	32	134	5
1870	392	648	62	95	246	20	43	23	154	5
1871	395	638	47	122	242	19	40	26	137	5
1872	400	693	43	126	275	24	37	38	146	5
1873	405	858	114	174	302	27	59	43	135	5
1874	412	848	91	212	290	24	53	41	132	5
1875	413	786	120	152	252	11	46	40	160	5
1876	420	813	154	139	237	18	38	42	181	5
1877	427	807	122	137	250	31	36	42	185	5
1878	433	844	192	127	261	21	28	35	175	5
1879	436	862	195	120	279	24	32	32	175	5
1880	447	928	191	126	314	24	37	52	179	5
1881	450	1,014	167	147	322	28	51	64	230	5
1882	461	1,159	181	178	381	35	65	77	236	7
1883	467	1,213	162	175	432	31	69	79	257	7
1884	469	1,330	220	183	449	30	66	92	283	7
1885	476	1,349	181	207	452	33	69	100	300	7
1886	489	1,454	191	209	462	33	88	100	364	7
1887	499	1,421	74	160	475	28	109	144	424	7
1888	513	1,344	31	116	503	22	97	146	423	7
1889	523	1,233	3	124	461	31	89	147	374	5
1890	527	1,238	77	164	422	29	69	145	327	5
1891	533	1,153	101	181	391	26	52	121	276	5
1892	537	1,143	164	163	361	26	43	115	264	7
1893	544	1,086	128	186	317	29	43	116	260	7
1894	547	1,073	104	183	315	29	41	125	269	7
1895	554	1,015	122	177	216	23	45	160	265	7
1896	562	1,033	148	177	184	26	43	182	266	7
1897	571	1,049	129	176	187	32	58	179	282	7
1898	580	1,069	80	176	180	33	80	203	309	7
1899	585	1,127	–8	177	188	35	120	255	353	7
1900	588	1,343	83	183	208	36	155	320	352	7
1901	598	1,384	132	204	224	41	122	297	357	7
1902	611	1,492	193	239	251	47	92	277	385	7
1903	620	1,551	164	274	259	46	91	300	410	7
1904	633	1,638	111	306	267	43	109	370	426	7
1905	641	1,866	142	335	300	53	135	449	444	7
1906	651	2,261	189	329	361	54	188	624	507	9
1907	662	2,593	228	349	393	53	248	743	569	9
1908	680	2,876	338	373	432	59	216	843	604	11
1909	695	2,803	118	444	529	78	180	783	660	11
1910	715	3,041	147	519	618	79	169	806	691	11
1911	740	3,148	130	555	646	69	219	784	734	11
1912	759	3,320	171	564	661	73	273	761	804	13
1913	782	3,255	180	547	652	65	272	706	821	12

Source: see text.

Table 6. Conjectural components of investment at the 1911 price level, 1861-1913

	(1) inv. in main-tenance	(2) total	(3) by and in ag.	(4) construction priv.	(5) construction pub.	(6) horses, harn's	(7) ships, r. veh.	(8) metal mach.	(9) tools, wood mach.	(10) display goods
					investment in new durable goods					
1861	375	1,129	51	100	296	22	130	73	444	13
1862	390	1,126	72	158	324	22	186	68	283	13
1863	397	1,191	62	134	358	20	235	57	309	16
1864	397	1,127	73	153	337	20	186	56	286	16
1865	401	1,164	35	128	362	20	176	70	358	15
1866	405	1,082	54	98	289	8	145	53	420	15
1867	413	999	24	110	227	12	127	66	419	14
1868	417	935	24	89	238	15	135	65	355	14
1869	428	990	52	107	213	18	129	88	369	14
1870	434	1,028	62	95	246	20	116	62	414	13
1871	436	975	47	122	242	19	105	68	359	13
1872	442	1,047	43	126	275	24	95	97	374	13
1873	447	1,220	114	174	302	27	147	107	337	12
1874	452	1,180	91	212	290	24	129	100	322	12
1875	454	1,133	12	152	252	11	110	95	381	12
1876	461	1,167	15	139	237	18	88	98	421	12
1877	466	1,148	12	137	250	31	82	95	420	11
1878	471	1,140	19	127	261	21	62	78	388	11
1879	474	1,145	19	120	279	24	69	69	378	11
1880	486	1,232	19	126	314	24	78	110	378	11
1881	488	1,385	16	147	322	28	105	132	474	10
1882	499	1,550	18	178	381	35	131	155	475	14
1883	506	1,610	16	175	432	31	136	155	505	14
1884	508	1,741	22	183	449	30	127	176	543	13
1885	513	1,763	18	207	452	33	129	187	561	13
1886	526	1,917	19	209	462	33	161	183	665	13
1887	536	1,956	7	160	475	28	194	257	756	12
1888	551	1,843	3	116	503	22	169	254	736	12
1889	560	1,664		124	461	31	151	250	636	8
1890	563	1,598	7	164	422	29	114	241	543	8
1891	568	1,434	10	181	391	26	84	196	447	8
1892	570	1,392	16	163	361	26	68	182	417	11
1893	577	1,317	12	186	317	29	66	179	401	11
1894	578	1,297	10	183	315	29	62	188	405	11
1895	584	1,239	12	177	216	23	66	235	390	10
1896	590	1,250	14	177	184	26	62	261	382	10
1897	599	1,261	12	176	187	32	81	251	395	10
1898	607	1,289	8	176	180	33	109	278	423	10
1899	610	1,373	–	177	188	35	160	341	471	9
1900	612	1,597	8	183	208	36	202	417	459	9
1901	621	1,597	13	204	224	41	155	378	454	9
1902	633	1,675	19	239	251	47	114	344	478	9
1903	639	1,722	16	274	259	46	110	364	497	8
1904	650	1,806	11	306	267	43	129	438	504	8
1905	656	2,026	14	335	300	53	156	519	513	8
1906	664	2,431	18	329	361	54	212	704	572	10
1907	673	2,751	22	349	393	53	273	818	627	10
1908	688	3,001	33	373	432	59	232	906	649	12
1909	701	2,885	11	444	529	78	189	822	693	12
1910	718	3,081	14	519	618	79	173	826	708	11
1911	740	3,148	13	555	646	69	219	784	734	11
1912	756	3,276	17	564	661	73	266	743	785	13
1913	775	3,169	18	547	652	65	259	673	782	11

Source: see text.