Discussion Paper Series

No.227

Exploring and Sharing Asian Economic History: An Interim Report on the Asian Historical Statistics Database Project

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November 2007

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A 21st-Century COE Program

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Exploring and Sharing Asian Economic History:
An Interim Report on the Asian Historical Statistics Database Project*

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19 Novemer 2007

* A revised, enlarged version of a discussion paper entitled as "Understanding and Sharing Asian Economic History: On the Significance of the Asian Statistics Database Project," D97-25, COE Project, Institute of Economic Research, Hitotsubashi University, Tokyo, February 1998; presented at a working seminar with Professor Emeritus Richard Hooley at the University of Pittsburgh on 27-29 March 2007. Research assistance by Mr. Rui Takahashi in the preparation of this essay is gratefully acknowledged.

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Abstract

This essay describes the aims and methods of an internationally linked, academic research project to create an economic database covering most of Asia. Named ASHSTAT, its purpose is to construct long-term, macro economic time series for the Russia, Central Asia, China, Korea, Taiwan, Indonesia, Philippines, Thailand, Vietnam, India, Pakistan, Egypt, and Turkey, using a standardised national accounting framework designed to maximise the compatibility and comparability of the data. The essay also discusses the value of the project, citing several illustrative examples, to show how cross-country comparison as well as time-based analysis may enhance the understanding of national economic development.

1. Introduction

In the fiscal year 1995, an academic project was launched at the Institute of Economic Research, Hitotsubashi University[1], with the financial support of the grant-in-aid program for scientific research administered by the Ministry of Education and Sciences, government of Japan. It was officially entitled as “the compilation of long-term economic statistics (or LTES for short) of the trans-Asian region,” and later nicknamed as “the Asian Historical Statistical Database Project (abbreviated as ASHSTAT).”

After the project was successfully completed in 2000, a new research grant with a wider topical coverage was allocated in 2003 to the same organisation, to establish the “Research Unit for Statistical Analysis in Social Sciences[2],” which encompassed ASHSTAT as an important subset. At the time of this writing, ASHSTAT is still an on-going project, and a plan has been drawn to publish its major findings in twelve volumes, as illustrated in the plan of publication

[1] This project was part of the centre-of-excellence program (abbreviated as COE) sponsored by the Ministry of Education and Sciences.

[2] More information about the project, including its newsletters, may be obtained via internet: http://WWW.hi-stat.ier.hit-u.ac.jp/englsih/index.html

(attached as the appendix to the present essay).

In the present essay, I wish to outline the main conceptual framework of the project, followed by possible applications of the proposed outcomes of the project.

2. The Objectives and Methods

The ultimate aim of the project is to estimate, construct, and compile sets of macro economic, historical statistics for the greater Asia, which meet the following two conditions, i.e. that (1) each component of the series in a given regional subgroup (a country, in most cases) remains consistent with other components within the subgroup ("internal" consistency), and that (2) the regional series are comparable across time and space ("external" consistency). Efforts are being made to start the series as far back as the mid nineteenth century and to complete them through 2000. In principle, the work will be confined to the compilation of annual time series for the very simple reason that it is the only practical method for compiling historical data covering a large variety of nations over such an extensive time period.

In order to satisfy the "internal" consistency condition of historical statistics, the ASHSTAT has adopted the 1968 scheme of the System of National Accounts (SNA for short), as advocated by the Statistical Office of the United Nations (1968b). In other words, consistency in this sense is to be established in reference to the current social accounting practices.

Not all the Asian countries are included in the work of compilation; nor can their statistical resources necessarily cover the entire stipulated time period. Moreover, strict comparability, both time and space wise, is difficult to maintain. These difficulties notwithstanding, it is deemed essential, as a matter of the philosophy of the project, to abide with those basic working principles for reasons which I shall explain later.

3. The Composition of the Database

Table 1 below exhibits the proposed composition of the envisioned database, which is listed in reference to three periodic time frames under consideration. In order to underline a few important implications of the table, several remarks are in order.

<Table 1>

First, as a direct consequence of the adoption of the SNA scheme, *domestic*, instead of national, concept will be used throughout the project.

Second, the concepts of products and of expenditures are basically *gross* of depreciation, marking a significant departure from the earlier, post-WWII practices of social accounting in the Western countries[3].

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[3] The measurement of depreciation (both economic and physical) is an area of technical difficulty as

Third, the economic actors are classified according either to (a) the flow of goods and services, or to (b) the flow of finance. The first category, (a), which is concerned with the accounts of production, consumption and capital formation, consists of the following four actors: industries, government services, private non-profit services to households, and households. "Industries" here refers to the aggregate sum of production activities by private enterprises, and is subdivided into several groups, according to common elements in technology and/or outputs, by utilising the two-digit classification scheme of *The International Standard Industrial Classification* (United Nations 1968a), whose abridged version is reproduced in Table 2 below. It is strongly recommended, in anticipation of adjustments which may be needed to reconcile possible conceptual discrepancies in industry classifications of different ages and regions, that its three-digit version be utilised insofar as possible in collecting and compiling the original statistical figures.

<Table 2>

The second category mentioned above, (b), is concerned with the sources and disposition of income, the accumulation and financing of capital, and balance sheets. In reference to this category, economic institutions are classified into five groups, namely, non-financial corporate and quasi-corporate enterprises, financial institutions, general government, private non-profit institutions serving households, and households. (Note that the last item includes non-financial private unincorporated enterprises.)[4]

These two classification schemes serve as the most essential frame of reference in compiling the final outcome of the ASHSTAT in as standardised a manner as practicable.

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far as long-term economic statistics are concerned. In the early days (after WWII) it was argued that national product net of depreciation would be the most relevant concept in assessing the potential of economic growth, since depreciation is an activity designed (by definition) to ensure the maintenance of the same reproductive capacity by getting rid of obsolete equipment and replacing worn-out capital goods, etc. One could argue, however, that the productive capabilities of a society are represented much better by the gross concept, since depreciation also forms an essential part of the day-to-day production.

[4] Care is needed to evaluate the product of banks and financial intermediaries. First, it should include, in addition to the net interest payments they actually receive, an estimate of imputed service charge, which is "the excess of the property income received by [them] on loans and other investments made from the deposits they hold, over the interest they pay out on these deposits" (United Nations 1968b, p. 97). Second, the imputed service charges thus estimated are treated as intermediate consumption by other industries. This "is tantamount to sub-dividing the charges of banks and similar institutions for loans to industries into two elements – a service charge and "pure" interest" (*ibid*.).

In addition, there are two other, equally (if not more) important systems of classification for the project, i.e. those of commodities and of occupations. Goods and services, the outcomes of activities of the economic actors, are to be classified with due respect being paid to *The Standard International Trade Classification* (United Nations, 1961). It is especially important that this standard be adhered to in constructing a meaningful international, trade-statistics database. On the other hand, *International Standard Classification of Occupations* (International Labour Office 1968) serves as a benchmark in identifying and analysing the structures of national labour forces and their transformations over time.

The outcomes of the above estimating procedures will be utilised, together with some additional estimating work, to arrive at the statistics of GDE (Table 3).

<Table 3>

4. Historical Digression

The intellectual origin of the effort to estimate national income goes back even earlier than the origin of modern economics (that is, to Sir William Petty (1623-87); see Studenski 1961, part One, 1). But most recent spread of its uses and applications is ascribable to the influence of a number of modern economists, who advocated the importance of social accounting in the 1940s and onward (e.g. Hicks (1942), Meade and Stone (1948), and Kuznets (1956, 1959)). Especially noteworthy in this respect are studies by Kuznets of the growth of nations. For this purpose he coined a new concept of "modern economic growth (MEG)," by which he referred to a sustained and substantial rise in product per capita, accompanied by the conscious application of modern scientific knowledge and (usually) by a noticeable increase in population (Kuznets 1966, ch. 1). The process of MEG has obviously implied, and in fact resulted in, "major structural changes and correspondingly large modifications in social and institutional conditions (Kuznets 1959, p. 15)."

The intellectual stimuli fused by these authors and others have since then yielded a series of valuable empirical studies including such titles as Butlin (1962), Deane and Cole (1964), Feinstein (1972), Kendrick (1961), Kim (2006), Kuznets (assisted by Jenks 1961), Maddison (1995), Mukherjee (1969), Ohkawa and Shinohara (1979), and Sivasubramonian (2000), among others. Whereas these monographs concentrate on fact findings and are very cautious in their interpretations, one may make further, bolder use of their statistics in order to construct integrated historical interpretation, as attempted in Japan by (for instance) Minami (1986/94), Nakamura (1983), Ohkawa and Rosovsky (1973), and Shintani (2003)..

The systematic compilation of macro statistics (as described above) must have been prompted by the introduction and the intellectual controversy ensued around the Keynesian economics after the 1930s. The timing coincided with the surge of general interest among government circles in effective control of macro economic policies, obviously prompted and encouraged by the needs of wartime economies. Lively discussions among economists regarding the workability of a planned economy were probably another factor, while the influence of the 1917 Revolution and the establishment of the Soviet Union (USSR) were also evident. After WWII, the coming of the Employment Act of 1946 in the USA was another, significant factor that gave strong justification for the government to intervene in the market by way of controlling the effective demand. This tendency lingered through most of the 1960s.

The interest in compiling macro statistics continued on after WWII in conjunction (either directly or indirectly) with the efforts to implement effective macro economic policies by central governments, on the one hand, and the disparate need to ensure rapid economic recovery in Western Europe, on the other. Commonly held also was the notion that economic development must be consciously promoted to ensure the wider acceptance of democracy as a sound political institution. A new subject, "economic development," was introduced to the curriculum in many American universities.

5. Conceptual Tool Box for Database Creation

Basic Philosophical Principles

The ASHSTAT Project aims at presenting a systematic set of "statistical facts" which would still provide an important (indispensable) basis for simple descriptive analysis of the loci of national economies. Underlying the development of social accounting has been the concept of the nation state as an essential unit of observation. Technically speaking, the basic unit of observation can be either narrower or wider, as the case may be. Nonetheless, the notion of a nation has served as the most important and essential foundation on which macro economic accounting has been built upon.

Another crucial, basic methodological position that has been adopted throughout by national-income accounting is that the economic evaluation of any activities shall be made on a market basis. Any activities that are not directly under the jurisdiction of the market shall therefore be "imputed" (assessed artificially) by referring to some kind of shadow prices which are supposed to approximate the valuation by market forces (if the latter had been in operation for the activity in question). Illustrative examples of such imputation may be taken from current practices, for example, in the estimate of the economic services rendered by private residential housing or of the value of agricultural products that are set aside for self-consumption.

Units of Observation

In order to ensure easy access to and convenient use of the database, the COE Project proposes that units of observations be standardised as much as possible. For example, the adoption of the western calendar, metric measures, and monetary denominations of the post-WWII period seems well warranted. In all other cases where there is reason not to follow the standard rule, explanatory notes, together with an appropriate conversion table, should accompany the statistics.

A newly emerged nation on the eve of industrialisation invariably realises the need to standardise units of measurement. The speed and ease, and virtual acceptance by the public, of standard measuring units signify the effectiveness of political leadership of the ruling government in a newly emerged nation state. It also is a *de facto* sign of the integrity of the national economy.

Historical Meaning of Industry-cum-commodity Classifications

One is to be reminded of the fundamental problem of classifications of any kind in dealing with historical time series, i.e. they are subject to unceasing changes over time. In fact, these changes are at the heart of the developmental issues and cannot (and should not) be neglected. For obvious reasons, old categories may disappear while entirely new ones are introduced as time goes on. The transformations pose a serious headache for economic historians, since, while it is not sensible to stick to a classification scheme designed for a certain point in time, one still needs a standard format to make meaningful comparisons. But it is precisely here that researchers come to direct contact with the motive forces of economic development.

A practical solution to this difficult (and insoluble) problem is to prepare a modified version of the standard scheme together with a converter between the two, being accompanied by full explanatory notes as to the underlying transformations of the economy.

In any event, the change presents a challenge for practical statisticians who wish to construct meaningful, comparative time-series statistics. From the historian's viewpoint, however, the need for such changes is a faithful indicator of the force of transformation at work, and therefore the existence of such an indicator should be valued highly and exploited as much as possible.

To give a simple illustration, one often encounters in the historical source materials of a developing society a category called "miscellaneous," which seemingly represents an insignificant item (be it a commodity, an industry, or an occupation). The value of this category may even look questionable since it is a hodgepodge of items all of which were regarded as of minor value either in quantity or in value at the time of the compilation of the statistics.

From the point of view of scholars interested in economic changes, however, the category may represent a source of extraordinary value. For instance, the "miscellaneous goods" were a very important source of foreign earnings in the early phases of Japanese industrialisation, as they included valuable exportable goods such as matches, toys and some other small items of seemingly little significance. Moreover, the category may contain some items that may later on prove to be highly important in the life of the economic community. Certain items in the chemical industry, for instance, were often labelled as "miscellaneous" in the nineteenth century sources partly because the chemical industry had not been firmly established yet. But the industry later became such a growing sector of the economy that it needed a separate classification of its own.

By the same token, one notes that the historical records of the mining industry often contain valuable information on the early activities of manufacturing, as it was essential for the mines, which were often located in far-away, mountainous locations, to have machine shops at hand in order to engage in maintenance and repair services. Mining must have contributed much more than usually believed to the early development of manufacturing capabilities of the so-called advanced, industrialised countries, especially in the late nineteenth and the early twentieth centuries.

Speaking of changes in industrial structure, one cannot possibly neglect the importance of the rise of the tertiary sector. This point, in fact, is a repetition of what was recognised centuries ago by Sir William Petty. Nonetheless, this phenomenon causes a serious problem for contemporary statisticians, since the statistical documents of the service industry leave much to be desired. In addition, there are practical difficulties in measuring some important economic concepts such as labour productivity in the tertiary sector.

Reference Years in the Database

Several reference points will be needed in constructing historical time series, for instance, in computing various index numbers. For this purpose, it is suggested that the year 1960 be adopted as a post-WWII reference year, as the project needs a reference point at the earliest possible date after WWII to serve as a connecting point of pre- and post-WWII series. The consensus judgement is that "normality" had been re-established by then.

If 1960 is too early for some countries (such as Indonesia, which was still struggling with political disorder then), however, a later year (say, 1970) may have to be used as an exceptional, unavoidable measure.

It is suggested, on the other hand, that a short term of 1934/36 be adopted as another reference point in the pre-WWII period, since the world economy found itself in relative stability during these three years. Another, earlier reference year may be 1913, which was a good year in business shortly before WWI.

Undoubtedly, however, the appropriate reference year may vary from one variable to another; e.g. peaks and troughs do not always coincide between them. The choice of the reference year is little more than a matter of convenience; one must have base year(s) in order to synchronise all the indices included in the project.

Missing Values

Some old documents are often marred with missing observations, due sometimes to measures to protect privacy, to the negligence of the surveyor, to the loss of original survey, or simply to deficient information. As a matter of basic principle, the Project ASHSTAT endeavours to make all the time series continuous without missing data. In case observations for some years are lacking, the utmost effort should be made to remedy the deficiency, ideally by direct estimation of the corresponding value, but alternatively with the help of some working assumptions (or hypotheses), e.g. the variable in question is complementary to another commodity whose data are available, and demand for the former moves more or less parallel to that for the other. If worse comes to the worst, the missing spot may have to be filled by simple interpolation. Whenever some such measures are taken, a record needs to be kept, spelling out the method of estimation and the reason(s) why it has been adopted.

Value Added

The concept of value added is essential in national income accounting. This is simply because one wishes to arrive at the aggregate value of newly produced goods and services for the year while avoiding any double counting. The domestic product is the summation of all the value- added records by industry for use in a region (a nation, for instance), net of intermediate transactions. As an economy develops, the network of economic agents is expanded so that inter-industry transactions are repeated many times before the final product is delivered to its end users. Hence, the degree of economic maturity of a society may be measured by the higher degree of “round-about-ness” in production. Put another way, the input-output (IO) table of the economy becomes increasingly more “congested” as the greater number of matrix elements take non-zero values (Torii 1979, ch. 10).

Value added of an industry j (V_j) may be computed quite easily so long as one is equipped with all the basic data sources, i.e.

$$\begin{aligned} V_j &= \text{Gross industrial output } (Y_j) \text{ - Sum of all the intermediate inputs} \\ &\quad \text{used by the industry } (\Sigma_{\text{all i}} R_j) \\ &= R_j \quad (1 \text{ - intermediate-input ratio } (m_i)) \\ &= Y_j \cdot \text{value-added ratio } (v_j), \end{aligned}$$

where $m_j = \Sigma_{\text{all i}} R_j / Y_j$ and $v_j = 1 - m_j$.

The computation of aggregate value added is facilitated if one may make use of the IO table, since the latter easily provides information on inter-industry transactions. As one goes back to earlier days, however, such information becomes increasingly scarce. Under such a circumstance, one may have to resort to either second- or third-best alternatives, e.g., estimate intermediate input rates for selected bench mark years where detailed production statistics are available, or estimate missing intermediate input rates by interpolations.

An important, and yet difficult problem related to the estimation of value added products is the calculation of the prices of the latter, which need to be derived by some artificial measures. A widely utilised method is that of “double deflation;” namely, the price of value added products is estimated as

$$(Y_j - \Sigma_{\text{all i}} R_i)/(y_j - \Sigma_{\text{all i}} R_i),$$

where Y and y stand for total nominal and real outputs, respectively, and R and r likewise for raw material and intermediate input in current and constant prices, respectively.

Flow and Stock

It is desirable, if possible, to construct the series of capital stock as of year t (say K_t), in addition to those of capital formation in the year t (I_t), both of which are of course related to each other as

$$I_t = K_t - K_{t-1}.$$

The stock variable embodies the cumulative effects in value of all the social and economic activities that have preceded it. For the same reason, it also affects the present decision on how much to invest and what project to invest in.

By the same token, a distinction should ideally be made between the population and labour force (stock concepts) and statistics on man-days and man-hours (flow concepts). In the case of labour statistics, the flow concept gives better representation of the quality of life, as it is related closely to the amount of leisure time that can be allotted in daily living.

The statistics of capital stock are not easily available because their estimation is time-consuming and cumbersome. Aside from the shortage of appropriate data sources, the standard of their evaluation is subject to incessant changes. In the case of labour data, by contrast, dependable flow statistics are relatively scarce and therefore pose more headaches than the stock data.

The Commodity-flow Method

One could argue that a most important reason for estimating the series of industry value added (V_j) is to set up a foundation on which to construct expenditure statistics, since the derivation of value added components of social production, with the help of commodity-flow method, is almost tantamount to estimating both consumption and capital formation.

The method entails the project members to trade economic transactions involved in the production of goods and services from their inception (purchase of materials, intermediate products, energy inputs, etc.) to their final delivery (sales either to other firms as intermediate consumption goods or services or as capital equipment, or to the disposing agents of final demand, namely households, governments, or exporters).

In the case of a cotton textile product, for example, the domestic value output (say, Y_t)

will be adjusted first by extracting exported portions (X_t) and adding imported goods (*Mt*) and taking note of changes in inventory (*Int*), to arrive at the estimated value of domestic consumption of the said commodity (C_t), so that

$$C_t = Y_t + M_t - X_t - Int,$$

ignoring commodity wastes for simplicity's sake. The total domestic consumption of all the textile outputs for a particular year may be obtained by repeating the same procedure for all the goods and services transacted in the industry, and summing them up. An exemplary long-term estimating work of personal consumption expenditures is given by Shinohara (1967), Volume 6 of the LTES Japan series.

6. Possible Uses of the Project Outcomes

Why does one bother with estimating LTES or ASHSTAT at all?

The answer to the question varies undoubtedly from one person to another. The final outputs of the project should be as value neutral as possible so that they can be utilised for as many different purposes as conceivable. The neutral stance notwithstanding, it may also serve a good purpose to spell out here possible uses of the database as envisioned by those who promote the project, with the hope that this will stimulate further intellectual curiosity in such a way that the database may be subject to critical and constructive comments.

First and foremost, it serves as a basic indicator of macro economic performance over time and also of possible structural changes in the economy[5]. Second, a very profitable use may be made of the macro economic time series as part of the study of comparative economic history (or comparable economic development).

The value of simple (hopefully analytical) description should not be underestimated, especially in view of the fact that sufficiently scrutinised empirical data are not always readily available at least in many regions of the world. The deficiency of the data is all the more serious if one looks for an objective (value-neutral) source of describing development performance from a comparative perspective.

More importantly, third, one would naturally be interested in proceeding to conduct hypothesis testing, for which long-term economic statistics will provide rich source materials. In fact we face quite a few unanswered questions in the world that surrounds us. If we are lucky, some of these riddles may be resolved by resorting to historical statistics. In the following, the present writer proposes to illustrate this point by referring to some interesting questions that have

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[5] One should be aware of serious criticism on the concept of national income or of GDP as a measure of economic welfare. Tsuru (1951) argued , for instance, that preventive expenditures for social bads (such as air pollution) would significantly increase the value of GDP.

been posed by historians in the past.

7. Illustrative Questions in Comparative Economic Development

Growth Performance

It is simply fascinating to uncover mere facts regarding changes in GDP and its industrial components over time. One may ask in this respect questions such as: When did MEG begin, why, and how? What are the characteristic features of the MEG in the region concerned? Were "long swings" (Abramovitz 1961) or "trend acceleration" (Ohkawa and Rosovsky 1973, pp.39-42) observable outside of the USA or Japan, respectively? What were the initial conditions of MEG? How does one evaluate the role of the initial conditions in (or their impacts on) the country's industrialisation? How about the hypothesis of concurrent growth of "modern" and "traditional" industries, as has been found applicable to Japan?

In order to answer questions like these, one needs to accumulate, critically evaluate, and estimate basic statistical information. This process often involves long, tedious work that requires the sound judgement of a well-trained researcher. A specimen example of such an effort is currently being made by ASHSTAT researchers in order to come up with a new estimate of manufacturing production in pre-WWII China and its historical path by taking a new look at the long deserted statistical documents (Guan 1997; see Figure 1).

＜Figure 1 ＞

An entirely new estimate of GDP of the People's Republic of China has been recently made public jointly by the State Statistical Bureau of the Chinese Government and the COE Project of the Institute of Economic Research, Hitotsubashi Univelrsity (1997). By comparing its results with a recent estimate made by Maddison (1995, p. 191), one may observe that the annual growth rates of GDP in the both estimates are remarkably similar (Figure 2). There are, however, substantial differences in the rate of growth in the manufacturing sector between the new estimate and that of Wu (1997). Why the latter difference came about will be a very important subject for future investigation.

<Figure 2>

Figure 3 presents an overtime comparison, attempted by Bassino and van der Eng (2007) of real GDP per capita for several Asian countries in the twentieth century, all expressed in relation to Japan's figure which is taken as the standard of reference (=100)[6]. It is noteworthy that (1) Malaya (corresponding to present-day Malaysia) led all the other Asian countries in the early decades of the century, that (2) Japan took over the position of Malaya only in the mid 1950s, and that (3) inter-country gaps in GDP per capita narrowed increasingly after the 1960s, indicating

[6] Based on provisional estimates made available by the authors' courtesy.

the smooth process of industrialisation in Asia during the post-WWII years.

<Figure 3>

In connection with Figure 3, the finding by Kim et al. (2006) that the per-capita real GDP of Korea under the Japanese rule (1910-1945) scarcely experienced a negative value during the period has proved to be a source of intellectual controversy, as it seems to be contrary to the commonly-held notion. The ensuing exchanges of opinions on the matter would hopefully lead the scholars concerned to examine more closely the accuracy of the Korean statistics as well as the method of their compilation during the colonial period.

The inter-temporal comparisons of real GDP across nations has a computational problem that might produce erroneous conclusion as to the relative ordering of the variable in question. This fact calls for careful attention especially when one deals with long-term data. In such a computation as displayed in Figure 3, the value of real GDP needs to be expressed in a uniform currency unit such as international dollar. But the purchasing power of a country's currency is bound to undergo significant changes over time, as the structure and the relative prices of the domestic products, together with the terms of trade vis-à-vis foreign countries may be drastically transformed. The point is demonstrated in Figures 4A and 4B[7], where real GDP per capita of China (C), Japan (J), Korea (K) and Taiwan (T) are presented using two different deflators (price indices), either ASHSTAT's (Figure 4A) or Maddison's (Figure 4B). One observes that the ordering of their per-capita GDPs differs depending on the selection of the deflator:

Period of observation	ASHSTAT	Maddison
1931-1945	J, T, K, C	J, K, T, C
1946-1968	J, T, C, K	J, T, K, C
1969-1992	J, T, K, C	J, T, K, C

<Figures 4A and 4B>

In relation to the findings above, it is instructive to looking closely at the structure of Korean export after the War, for instance, one is struck by drastic increase in the proportion of machinery products after 1970, while that of textile goods declined sharply (Figure 5) [8]. Based on provisional estimates made available by the authors' courtesy. By contrast, Taiwan's process of industrialisation was more gradual compared with that of Korea; gradual also was the declining trend in Taiwan's agricultural activities (Mizoguchi 2007, ch.7).

<Figure 5>

The relative position of Japanese and Chinese GDPs, on the other hand, changed little during the entire period of observation; the difference in their values between the two countries

8 Based on provisional estimates made available by the authors' courtesy.

8 Borrowed from a worksheet of Dr. Tanjuan Yuan.

was so great in these years that even significant transformations in the Chinese industrial structure and the accompanied shifts in relative prices were not sufficient to alter the ordering of the real GDPs per capita.

A lesson of the exercise above is simply that one should make use of a chained PPP index (a variant of the Divisia index) in computing real GDP time-series especially when one attempts at long-term, international comparisons over time.

Compositions of GDE

Modern economists have inherited many valuable intellectual assets from past generations, including several hypotheses regarding the components of GDE. With regard to personal consumption, for instance, the permanent income hypothesis by Friedman (1957) still presents an attractive theoretical possibility and may deserve new attempts at checking against new data from the wider Asian region.

On the side of capital formation, one would be curious to find the movements in investment ratio *I/Y*, inasmuch as investment is the motive power of economic growth. Also highly relevant is a question how capital formation has been financed. Despite a widely held view that workers in the early stage of economic development do not save much, there seems to be some evidence that this may not be necessarily the case, as Smiles (1861) reports that as a result of steady growth of workmen's earnings in the nineteenth century England they saved considerable proportions of their incomes.

A very exciting feature of the new SSBC/COE study (1997), as mentioned above, is that an effort has been made to complete long-term GDE series by revising the old MPS (material product system) version of gross expenditures. The estimated results reveal that the investment ratio has continued to grow after 1962, which has in turn been supported by a gradual increase in domestic savings rate (1 - average propensity to consume). It is interesting to note that both of these expenditure patterns are similar to those of pre-WWII Japan, as reported by Ohkawa and Shinohara (1979, pp. 251-53) and depicted in Figures 6A and 6B.

<Figures 6A and 6B>

The role of foreign trade in the early phases of the MEG still warrants an empirical examination; for instance, to see the extent to which it served as a demand-pull factor of economic growth, etc. Related here perhaps is the policy choice between import substitution and export promotion. Also, how important was the role of international capital inflow? The Korean path, for instance, was quite different in this regard from that of other nations inclusive of Japan.

Regional Income Disparities

Effort has being made to either revise, or introduce, entirely new estimated series to now-renown long-term economic statistics (LTES) of Japan since 1868 by Ohkawa and Shinohara (1979). Following two diagrams present a few exemplifying results of such effort. Fig. 7[9], for instance, indicates a marked decline in the regional dispersion in per-head manufacturing products after the 1910s[10]. The coefficients of variation in the gross nominal values of manufacturing output by region became increasingly larger in the early process of the country's industrialisation, reaching a peak in 1910, after which an unmistakable declining trend set in through the 1950s, collaborating economic historians' observation that the process of Japanese industrialisation began on or immediately after the Russo-Japan War of 1904-1905 (See, for instance, Ohkawa and Rosovsky 1973). One also notes that the decline in the value of the coefficient receded during the period 1940-1955, while resuming its former trend after 1956 until around 1970, due obviously to the phenomenal growth of per-capita GDP during the period.

<Figure 7>

Population

No doubt population forms a highly important area of investigation in ASHSTAT. A study by Takahashi (1997) of North-eastern Thai villages indicates that there is, contrary to the previously accepted view, apparently a rational mechanism which works in such a way that any unbalances between population and economic well being will be adjusted after some time; in the farming sector, the mechanism worked by way of (1) expanding arable land area and (2) making use of off-farm employment possibilities (e.g. participating in commercial activities, day employment in urban districts, working as unpaid family workers, etc.). After the beginning of industrialisation, however, the population transition set in; the rise in the cost of raising children, as well as the decline in death rates due to the introduction of modern medicine and improved sanitary conditions, shifted emphasis from quantity to quality in human investment, thus suppressing pressures on birth rates.

Unemployment

Economic development in East Asia seems to have experienced the coexistence of both abundance and shortage of labour. Whereas labour is abundant in villages during the slack season, for instance, there are ample opportunities for the seasonally abundant labour to engage itself in within-the-farm, non-agricultural activities. On the other hand, the agricultural demand for labour repeats seasonal ups and downs. Labour supply is therefore quite abundant in the annual averages, and yet achieves a more-than-full-employment status during the peak season (see

[9] Based on a power-point presentation prepared by Messrs. Fukao and Yuan (2007).

[10] The peak for heavy industries reached earlier at around 1890, however.

Sen 1966).

Moreover, one finds historical evidence that suggests that new technologies borrowed from the West have been of labour-augmenting varieties and that this was true in both manufacturing and agriculture (Odaka 2003). Until such time comes as the urban industrial sector is expanded to a sufficiently high scale and efficiency so that the on-farm, non-agricultural production activities are defeated and disappear, and hence their employment absorption capabilities disappear, the economy abounds with ample supplies of labour, although the latter do not make their existence felt in the market by way of (for instance) rising unemployment. Under such circumstances, it may be possible that gradual increases in real per capita household income have coexisted with the stagnancy in real earnings of common wage labour.

With the above considerations in mind, the recent findings from the Thai labour market seem quite striking. Assuming for the moment that the basic statistical survey was consistently made with reasonable accuracy, one observes a drastic upward movement in the unemployment rate after 1980 (cited by Suehiro 1997, pp. 72-73; see Figure 8)[11]. The increase may have been caused by a structural transformation which took place in the Thai society in the 1970s, and that therefore redundant labour resources could no longer be contained in "disguised" fashion in the 1980s and onward. The phenomenon may partly be ascribable to the very rapid urbanisation of the economy, which has attracted swarms of job seekers into the urban areas (especially the Bangkok region). In any case, the emergence of such a substantial size of visible unemployment is quite a contrasting feature as compared with that of (say) Japanese industrialisation even up to the 1990s. This of course leads one to the question: why the difference?

<Figure 8>

Disguised Unemployment?

Utilising the annual value-added time series data of agricultural production, together with their corresponding input series (i.e., labour, land and capital stock), Odaka-Yuen (2006) estimated Cobb-Douglas production functions for pre-WWII Korea, pre- and post-WWII Taiwan, and pre- and post-WWII Japan, and compared their results with similar computation results for post-WWII Thailand by Shintani (2003), among others. According to the estimation results,

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[11] In Figure 8, *U* stands for the slack (dry) season, whereas *U'* for the busy (wet) season, and U_{Avg} for the weighted average of the two.

The definition of labour force included persons of age 11 and above, which was changed in 1989 to persons of age 13 and over. Adjustments of the data to reflect the change will not, in all likelihood, eliminate the drastic upward shift in the 1980s of the Thai unemployment rate.

the relation between average or marginal labour product (ALP or MLP, respectively) and the value of annual agricultural labour compensation (w) was as follows:

pre-WWII Korea	w = ALP > MLP,
pre- and post-WWII Taiwan	ALP > w = MLP,
Japan up to 1940	w = ALP > MLP,
Japan in 1950-1960	ALP > w > MLP,
Japan in 1845-46	ALP > w = MLP,
post-WWII Philippines	ALP > w = MLP, and
pre- and post-WWII Thailand	ALP > w = MLP.

A rather conspicuous finding on pre-WWII Japan and Korea, as shown in Figures 9A and 9B, perhaps reflects the practice of employment sharing by family-operated, small farming households during the time, an interpretation consistent with that of Professor Ohkawa (1972, pp. 61-76), who termed the phenomenon as "over-employment," which must have virtually eliminated unemployment in pre-WWII Japan.

<Figures 9A and 9B>

Real Wages

What was the general trend of real wages during the process of industrialisation? It is by now common understanding that it did go up during the British Industrial Revolution, as suggested many years ago by Ashton (1949), despite the old controversy regarding the thesis of the immiseration of the working class (e.g. Kucynski 1942-46).

Economic historians' interest in the beginning phase of modern industrialisation (or MEG) have taken them to look more closely at the period immediately preceding it. While the formation of comprehensive time-series statistics of macro economic performances (such as GDP) is not quite feasible at present, highly suggestive information has been uncovered by way of international comparisons of labour compensations. Saito et al. (2006) presents the results of such an attempt, as the authors have made long-term comparisons of real daily wages (of both construction and unskilled workers) prior to industrialisation in two European and one Japanese cities (Oxford, Milan, and Kinai (Kansai region including Kyoto)), and those in the early phases of industrialisation in Asia (Peiching, Kwantong, and Kyoto), as depicted in Figures 10A and 10B. Their observation has discovered (1) that European real wages in the eighteenth century exceeded the corresponding level in Japan throughout the pre-modern age, and (2) that wages in China and Japan were more or less similar in terms of their absolute values through 1900, after which the former recorded a long upward shift, indicating the arrival of the manufacturing-come-of age in the latter[12].

<Figures 10A and 10B>

Wage statistics in modern Asia, however, are not the easiest part of historical statistics compilation. Nonetheless, significant advance has been made in this field by Bassino and van der Eng (2007), who attempted cross country comparisons (England, France, Italy, Thailand, Hong Kong, and Japan) of real wages at an early stage of industrialisation. According to them, who compared rice wage indices as well as "welfare ratios" for select urban centres in East and South-east Asia (Bangkok, Hanoi, Penang, Saigon, Singapore, and Tokyo)[13], the labour earnings in Bangkok were much higher than (in fact, up to four to five times as high as) that in Tokyo not only in the 1880s but also as late as in the 1930s (Figure 11[14]). This finding is significant, particularly in view of the old-time thesis advanced by an early empirical quest made by a Japanese economist, Moritaro Yamada (1934), who claimed that the wage level in Japan at the dawn of its industrialisation was well below that of India.

<Figure 11>

Technological Change in Manufacturing

Technological progress has been a favourite subject of economists and economic historians. Whereas macro statistics do not supply sufficient information as to the exact nature of changes in production technology and of innovation processes, they nonetheless record the *de facto* locus of such changes and their impacts on the structure of the economy. For this purpose, concepts like labour productivity (*Y/L*) and capital intensity (*K/L*) play a very important role (where L stands for labour input). Normally one expects to find that higher levels of *Y/L* are accompanied by ever-rising values of *K/L*. It is surprising and quite perplexing, therefore, for one to find that the growth of the former in Thailand went hand in hand with a declining (albeit at a slow rate) trend of the former over a substantially long period after WWII (Shintani 1993, pp. 200, 204, 206; see Figure 12). How does one interpret such a finding as this? Does he/she ascribe it to mere statistical fallacy, or judge it to reflect some reality in the economy? If so, why? If not, why not?

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[12] If the above is the state of art today, why is it that real wages in the non-agricultural sector kept declining in the Philippines during the Macros and even through the Aquino regimes, despite a slow yet steady increase in real per capita income?

[13] Rice wage = (nominal daily wage in silver grams) / (market price of one kg of second-rank rice in silver grams). Welfare ratio = (daily wage x 250 days) / (price of commodity basket x 3 adult equivalents).

[14]. Based on provisional estimates made available by the authors' courtesy.

<Figure 12>

8. Concluding Remarks

Whereas no data exist without the presence of some theoretical background, no testing (or validation) can possibly be made without empirical data. This simple fact, however, should form no barrier for us to proceed with empirical examinations of social and economic phenomena. Obviously, subtlety and care is required in cases where interface with fundamental institutional set up and/or cultural value system must be discussed. Nonetheless, methodological difficulty inherent in studies of social and humanities sciences has caused too much (and unnecessary) fuss on the part of the professionals with regard to the difficulty to come to definite assertion, thus increasing the number of methodological agnostics on the value of quantitative economic history.

Empirical studies tend to lag behind theoretical discussion: for the very simple reason that data processing and data manufacturing cannot possibly catch up with changes and development in new intellectual endeavours. While some old hypotheses are still in discussion, a surge of new topics is often introduced, and a new series of research must be started with only insufficient data sources to back them up.

As a result, economic research continues on in such a fashion that some old topics do not die out easily and, in fact, come back to the stage after a while with some new dresses on. The seemingly infinite recycling of this kind may be a reason why the history of economic doctrines often fails to excite the mind of young scholars and graduate students.

In any event, the role of empirical data and of data engineering is quite important since they form the essential basis on which old hypotheses are tested before they form indispensable ingredients of new theories.

Our knowledge should be checked against the data and, if necessary, be revised as new facts are discovered. For this very simple reason, the formation of basic statistics should be continued on in as systematic a manner as possible. In this sense, the compilation of basic data is one of the most important social contributions of the present generation to the future generations.

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Appendix

Long-Term Macro Economic Statistics in Asia:

Plan for the Publication in Japanese of the Research Outcomes

(1) Overview

a) General editors: Konosuke Odaka, Osamu Saito, and Kyoji Fukao (all associated with the Institute of Economics, Hitotsubashi University).

b) Planned contents and editors of the series:

Country/Region	Editor(s)
1. Taiwan	Toshiyuki Mizoguchi (Hiroshima Keizai University)
2. Vietnam	Jean-Pascal Bassino (Australian National University)
3. Mainland China	Ryoshin Minami (JosaiUniversity) and Fumio Makino (Tokyo Gakugei University)
4. Korea	Toshiyuki Mizoguchi and Hak K. Pyo (Seoul National University)
5. Thailand	Akira Suehiro (University of Tokyo)
6. India/Pakistan	Yukihiko Kiyokawa (Tokyo International University)
7. Indonesia	Pierre Van der Eng (Australian National University)
8. Russia (appendix volume)	Masaaki Kuboniwa (Hitotsubashi University)
9. Egypt and Turkey	Hiroshi Kato (Hitotsubashi University)
10. Philippines	Yoshiko Nagano (Kanagawa University) and Konosuke Odaka
11. Central Asia and Russian	Noriaki Nishimura (Hitotsubashi University),
12. Japan	Osamu Saito, Kyoji Fukao and Konosuke Odaka

Notes: i) The list is arranged in the approximate order of readiness for final release.

ii) Additional areas may be included if feasible.

iii) The publication of the series will take place (hopefully) at a pace of two volumes per year.

(1) Format of the series

a) Standard contents:

(1) Introduction、together with historical changes in the land area and national boarders, accompanied (if necessary) by historical map(s) and some discussions on the significance of the present volume in relation to similar research outcomes from the past

(2) Brief outline of the institution that compiled statistics, and changes over time, together with discussion of the accuracy of the statistical information

(3) Discussion of the methods and outcomes of the annual time-series statistics on:

1. Population

2. Labour force and employment by major industries (as listed below in items 3 through 7)
3. Output and value added, both nominal and real, of agriculture, forestry and fishery
4. Output and valued added, both nominal and real, of mining and manufacturing
5. Output and value added, both nominal and real, of construction, transportation, telecommunication, and utilities
6. Output and value added, both nominal and real, of public services
7. Output and value added, both nominal and real, of sales, real state, and other services
8. Money supply (cash balance and M1) and price series, inclusive of GDP deflator, wholesale and retail prices, consumer price index, wages, interest rates and foreign exchange rates
9. Government finances
10. External trade by major commodities (ideally classified by the standard international commodity classification), and the balance of payments
11. (If feasible) personal consumption expenditures and the standard of living
12. (If feasible) capital formation and capital stock
13. GDP, nominal and real (these series are indispensable)
14. Other relevant series

(4) Statistical appendix, which may take up (say) 20-30% of the volume pages

(5) English abstract (by chapter)

Actual chapter composition may vary slightly from a volume to another, depending on the availability of source materials, etc.

b) Each chapter in item (4) above will consist of discussions on

(1) Original sources,

(2) Methods of estimation,

(3) Major findings and their interpretation, and, if necessary,

(4) A more detailed description of the original sources.

A well-formulated index shall be placed at the end of the volume.

c) Time period to be covered: the twentieth century, i.e. 1901-2000. Annual time series are expected, with missing values estimated as much as possible. It is suggested that especially valuable information on earlier decades be included in the attached CD-ROM.

d) Brief outlines of the estimating procedures will be presented both in the text and in the respective appendix tables. All the statistical tables should be accompanied by English captions and explanatory notes.

e) Utmost care will be taken by the author(s) of each chapter to clear the copyright(s) of the original source materials, articles, books, etc., whenever such contributions are used and/or quoted extensively. Sufficient documentation will need to be provided regarding the nature of the original source materials and the place(s) of their holding(s).

(2) Forms of publication

a) In principle, the major estimation results will be made available via hardcopy (i.e. books of approximately 300 printed pages or so), whereas related, more detailed series may be stored on an accompanying CD-ROM. In addition, the principal estimated series may be made accessible on the web sites of academic institutions, provided that permission for reproduction is granted.

b) The editorial committee regards it to be highly essential, for the benefit of future research, that a copy of all the original source data be deposited with the Library of the Institute of Economic Research, Hitotsubashi University or at places to be designated by ASHSTAT. The original data will not be reproduced in the present series.

c) In addition, the worksheets used for the estimation processes should be bound and kept in the same library (or libraries) in anticipation of future use, either for examination and/or re-estimation of the time series.

(Originally composed 26ii2002, slightly revised 11ix2006)

Table 1.

A Suggested Format of the Estimated Results

Series items	Periodisation	Pre-WWll Period	WWⅠⅠ Period	Post-WWll Period
Nominal GDP, by industry				
Real GDE , by industry				
Indirect taxes - subsidies , by industry				
GDP deflator , by industry				
Employment , by industry and sex				
Wages and salaries , by industry and sex				
Nominal GDE , by components				
Real GDE , by components				
GDE deflator , by components				
Net receipts of income from abroad				
Prices (prices by item , CPI* and WPI+)				
Interest rates (prime and commercial rates)				
Foreign exchange rate				
Money supplies （currency and deposits）				
Capital stock (optional)				

(Notes) ＊ : consumer price index ＋ : wholesale price index

Table 2. Classification of Production Activities

1. Agriculture, hunting, forestry and fishing
   11. Agriculture and hunting
   12. Forestry and logging
   13. Fishing

2. Mining and quarrying
   21. Coal mining
   22. Crude petroleum and natural gas production
   23. Metal ore mining
   29. Other mining

3. Manufacturing
   31. Food, beverages and tobacco
   32. Textile, wearing apparel and leather
   33. Wood and wood products, including furniture
   34. Paper and paper products, printing and publishing
   35. Chemicals and chemical, petroleum, coal, rubber and plastic products
   36. Non-metallic mineral products, except products of petroleum and coal
   37. Basic metal
   38. Fabricated metal products, machinery and equipment
   39. Other manufacturing industries

4. Electricity, gas and water
   41. Electricity, gas and steam
   42. Water works and supply

5. Construction
   50. Construction

6. Wholesale and retail trade and restaurants and hotels
   61. Wholesale trade
   62. Retail trade
   63. Restaurants and hotels

7. Transport, storage and communications
   71. Transport and storage
   72. Communication

8. Financing, insurance, real estate and business services
   81. Financing institutions
   82. Insurance
   83. Real estate and business services

9. Community, social and personal services
   91. Public administration and defence
   92. Sanitary and similar services
   93. Social and related community services
   94. Recreational and cultural services
   95. Personal and household services
   96. International and other extra-territorial bodies

0. Industries not elsewhere classified
   00. Industries not elsewhere classified

(Note) Adapted from U.N.(1968b), pp.84-85.

Table 3.

Standard Composition of Gross Domestic Expenditure

1. Final Consumption expenditure, nominal and real
   - 1.1. Personal consumption
   - 1.2. Government consumption

2. Gross domestic capital formation, nominal and real
   - 2.1. Private
     - 2.1.1. Agriculture, hunting, forestry and fishing
     - 2.1.2. Mining and manufacturing (producers' durable equipment)
     - 2.1.3. Civil engineering and general construction
     - 2.1.4. Residential construction
   - 2.2. Public

3. Net changes in inventory

4. Export of goods and services

5. (-) Import of goods and services

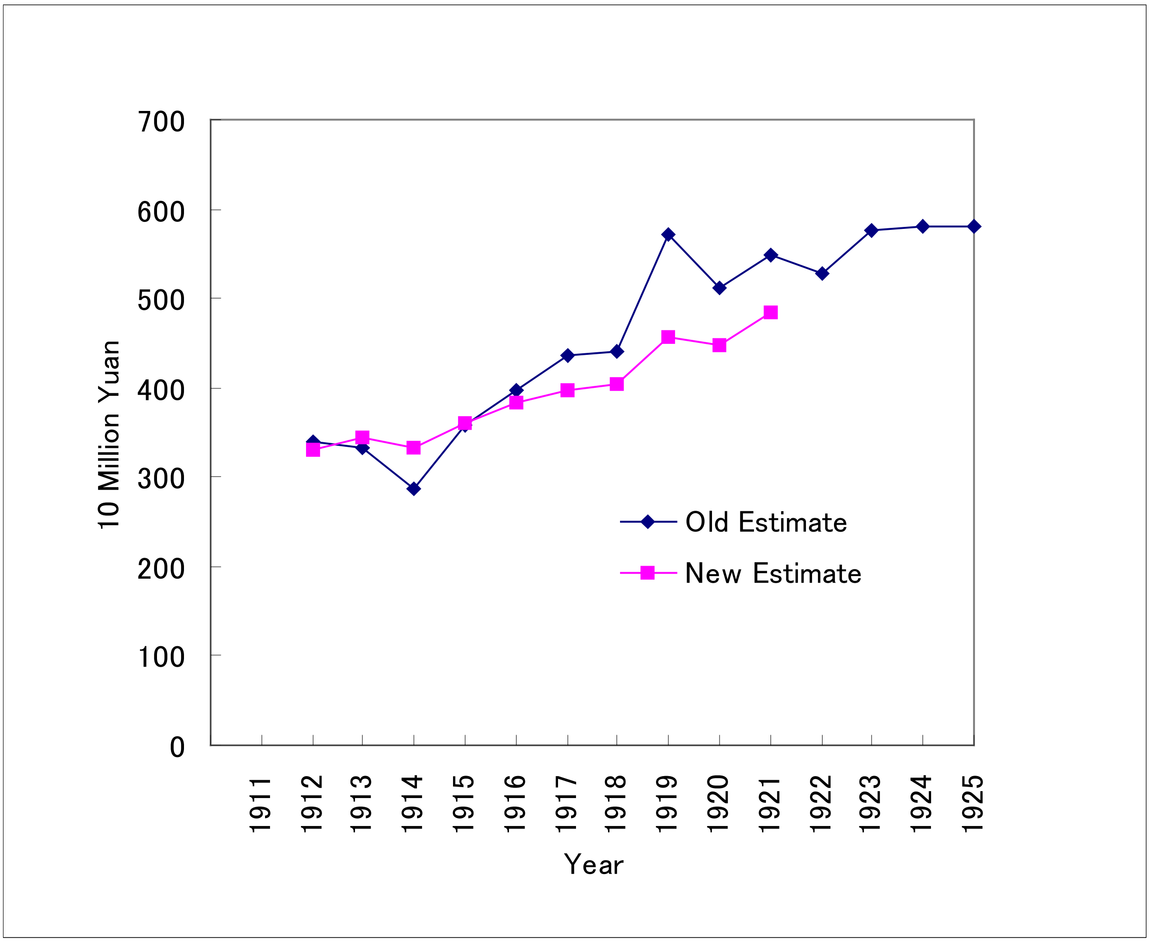
Total: GDE

6. Net factor income from abroad

Total: GNE

Figure 1.

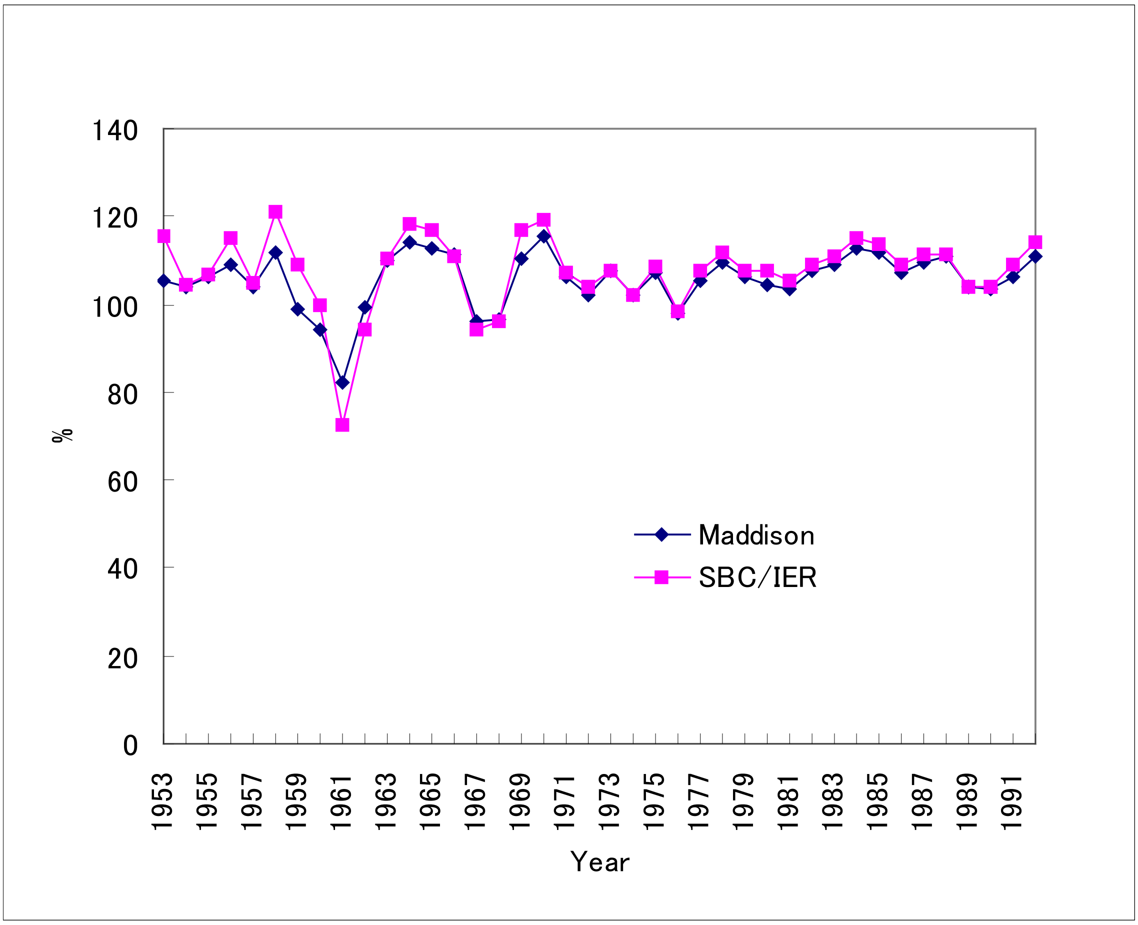
Old and New Estimates of Manufacturing Output, China



(Source) Guan (1997).

Figure 2.

Annual Growth Rates of Real GDP, China

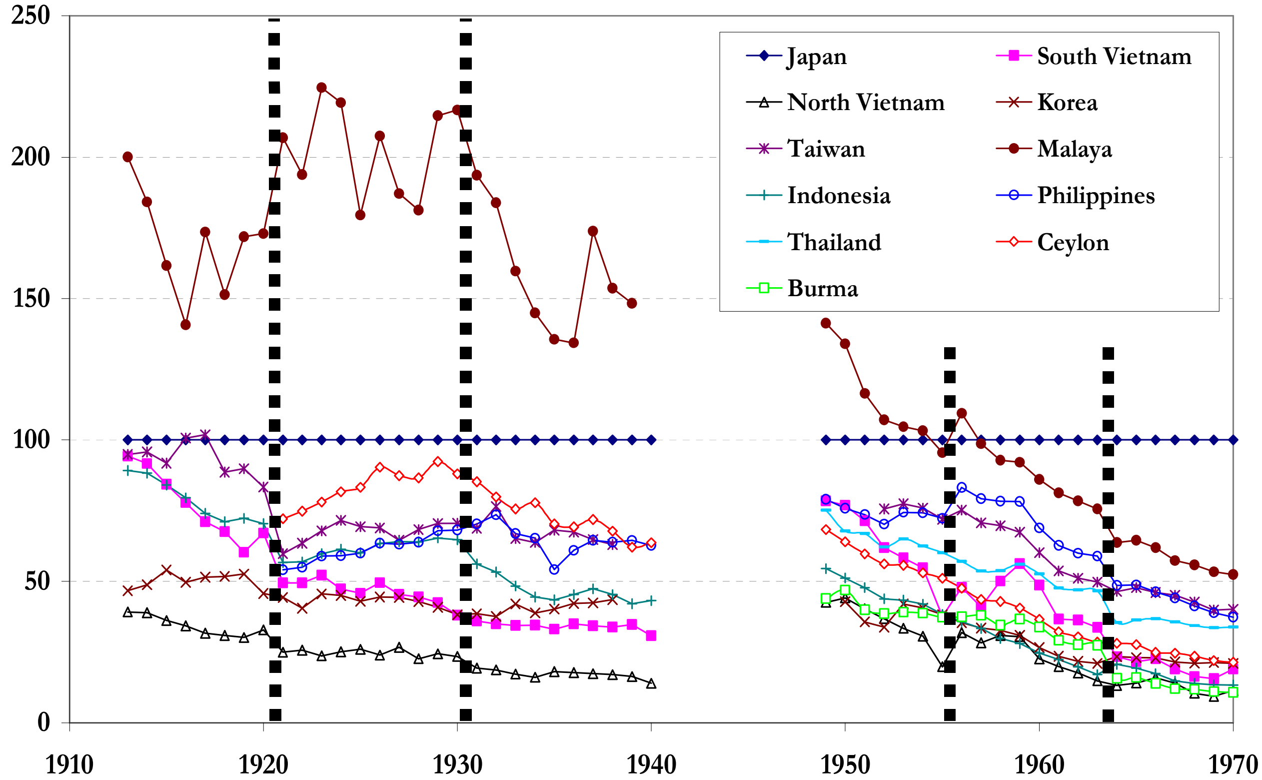


(Sources) Maddison (1995, p. 191) and State Statistical Bureau (1997).

Figure 3.

Per Capita GDP in Selected Asian Countries 1913-1970

(Japan=100)

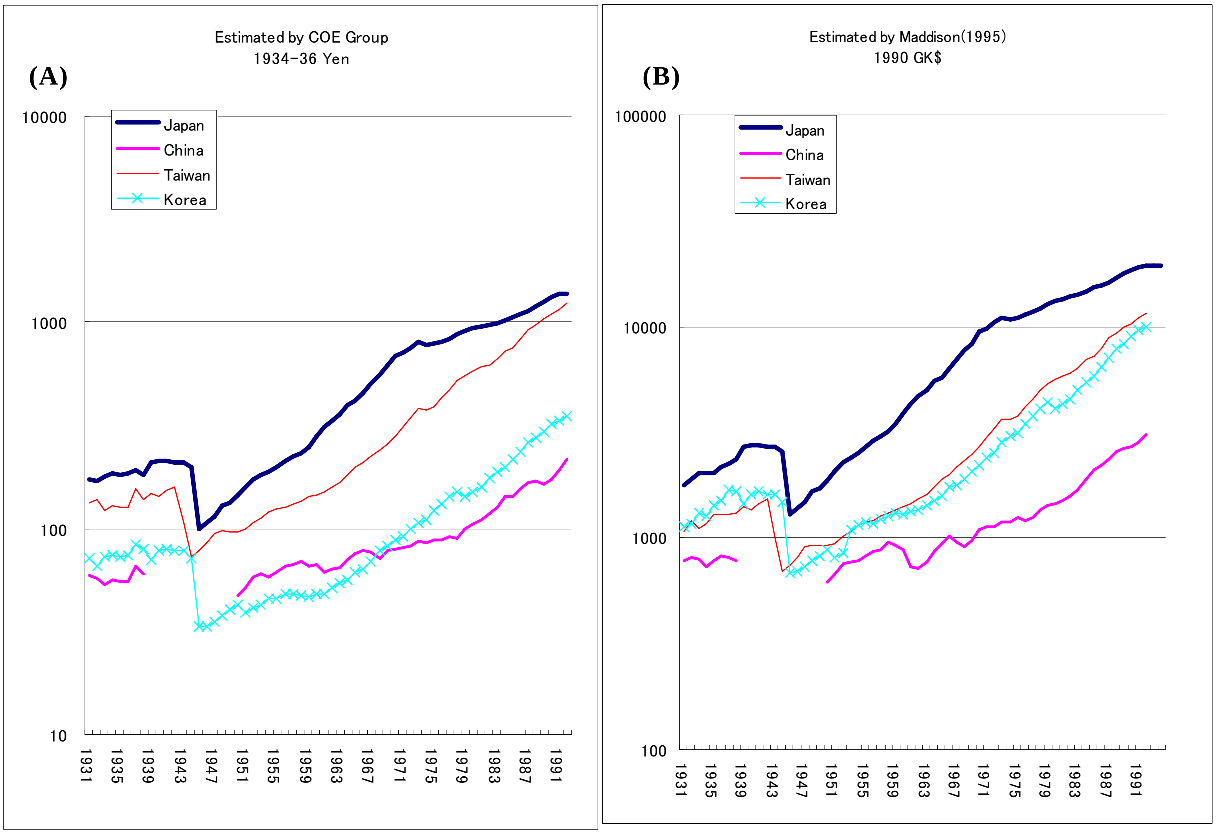


(Note)The dotted bars indicate breaks caused by changes in the reference years .

(Source) Bassino and van der Eng(2007).

Figure 4.

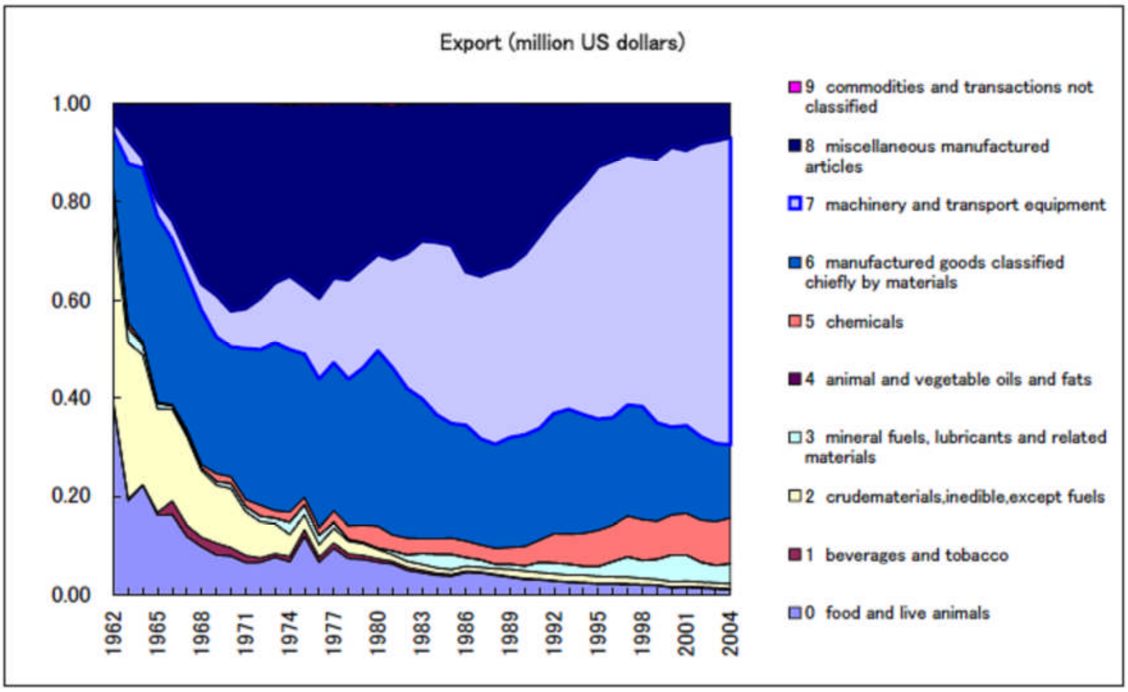
The Index-number Problem: an Issue in the International Comparison of GDP



(Source) Fukao, Ma and Yuan(2006).

Figure 5.

Structural Transformations in the Korean Export

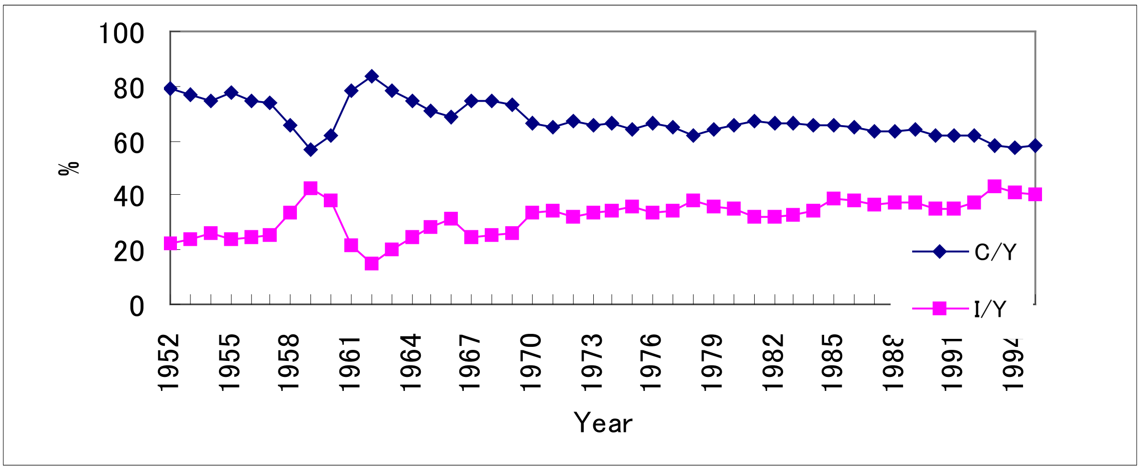


(Source)Fukao and Yuan(2006).

Figure 6.

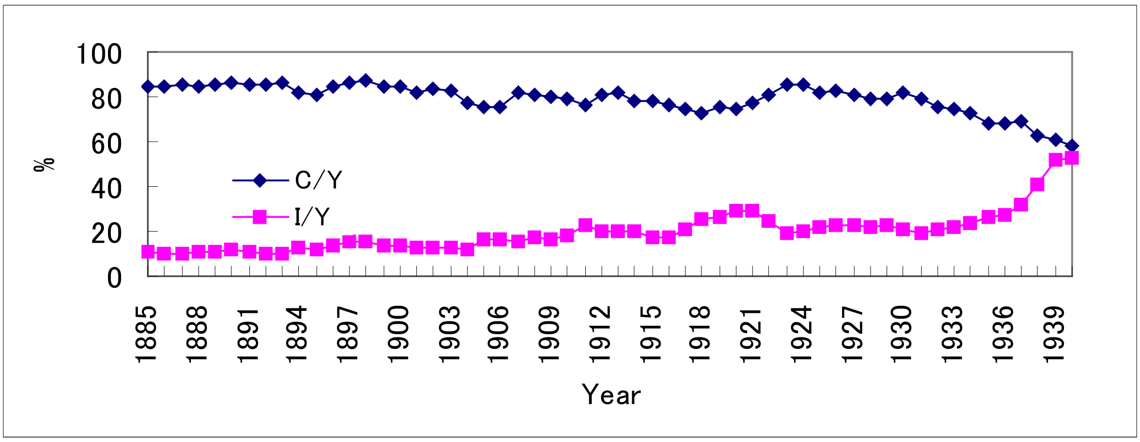
Expenditure Ratios

(A) China 1952-1995



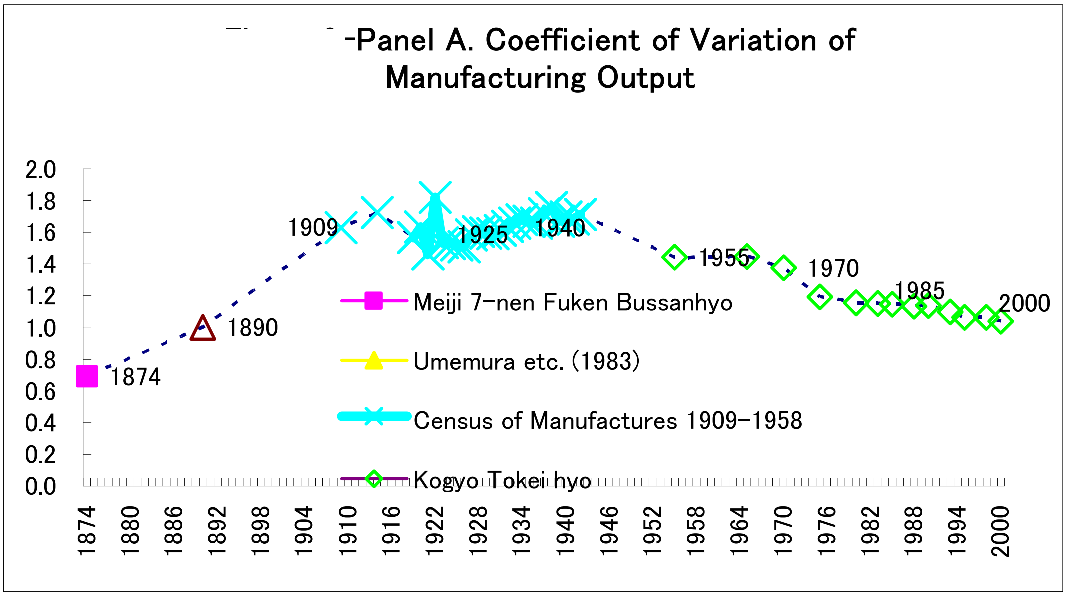
(Source) State Statistical Bureau (1997).

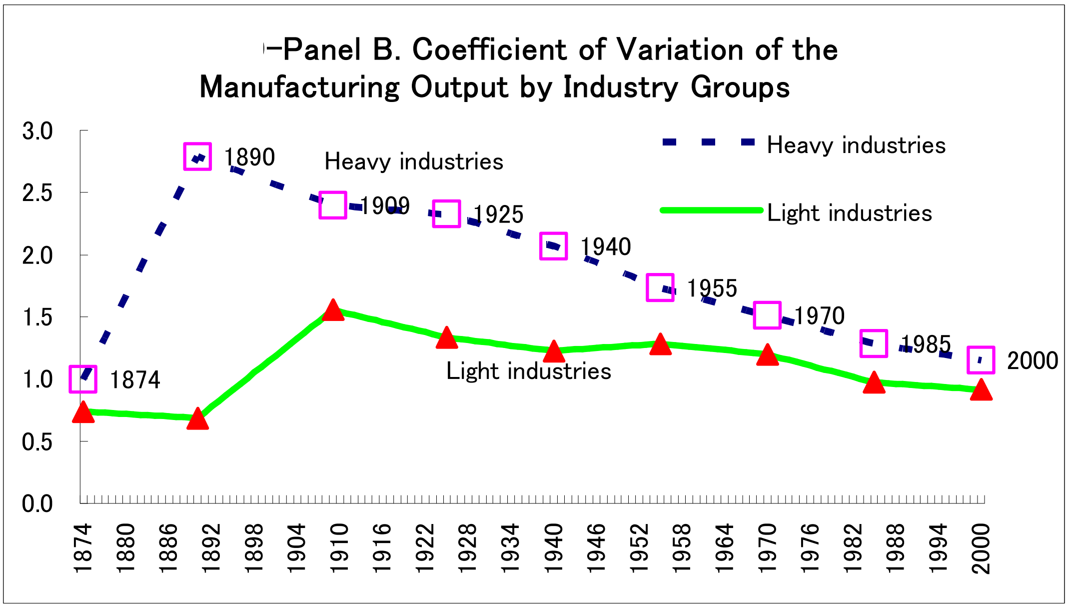
(B) Japan 1885-1940



(Source) Shinohara (1979, pp.251-253).

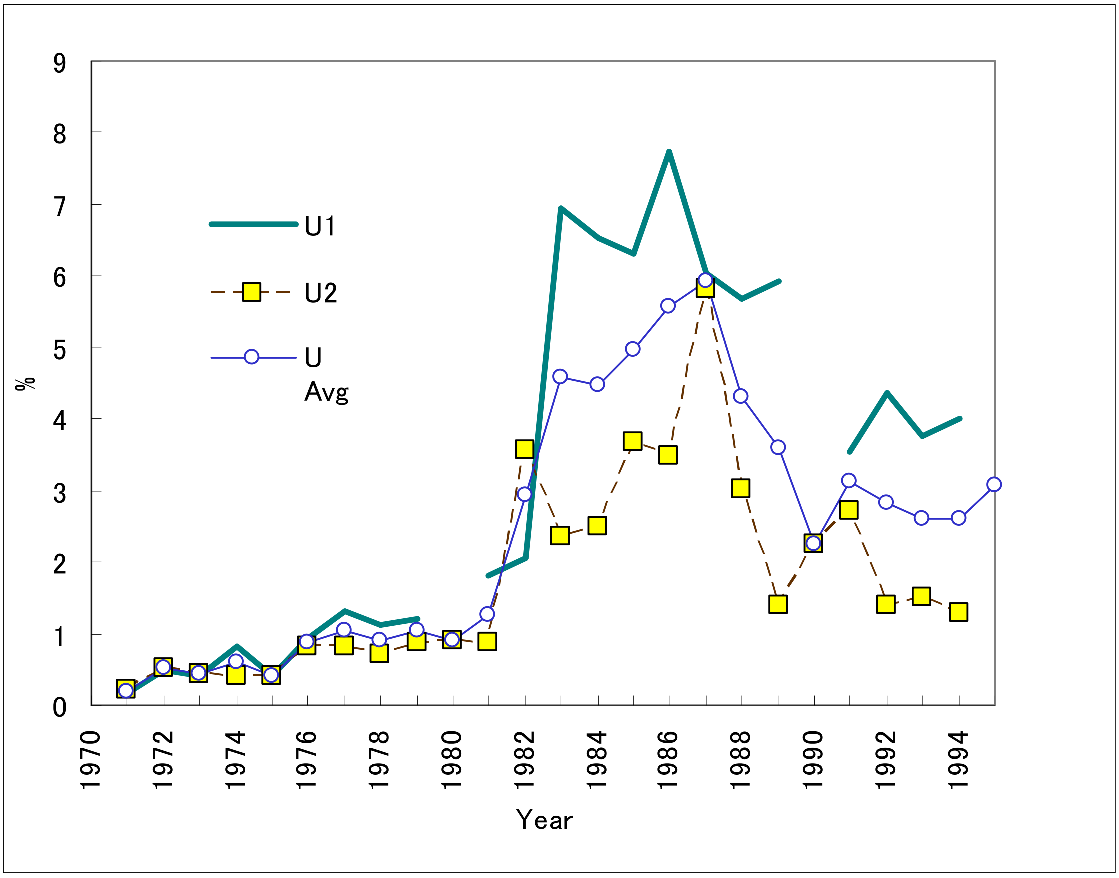
Figure 7.
The Declining Trend in Regional Dispersion
in Japanese Manufacturing Output, 1874-2000





(Source)Fukao and Yuan(2007).

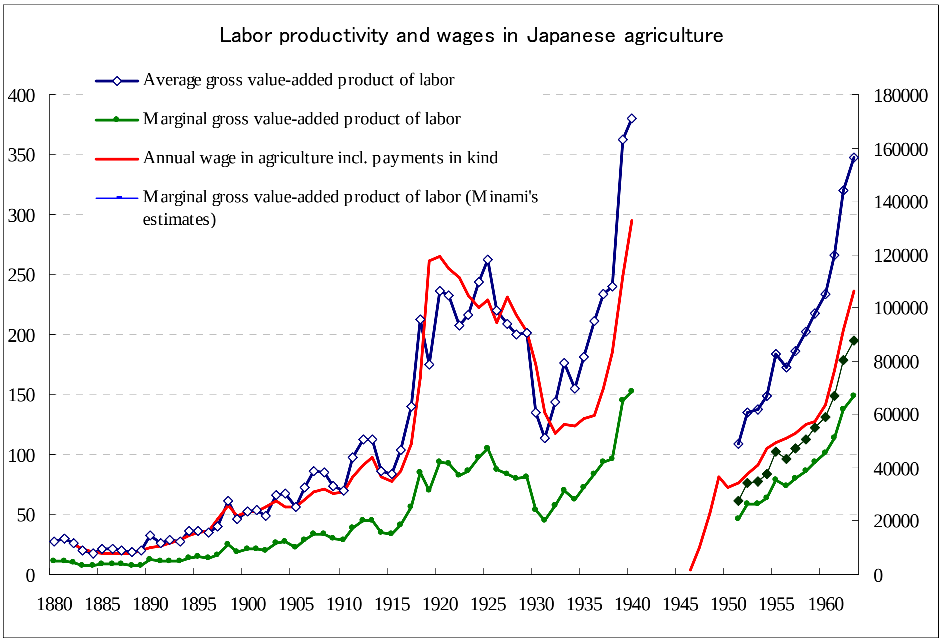
Figure 8.
Unemployment Rates in Thailand



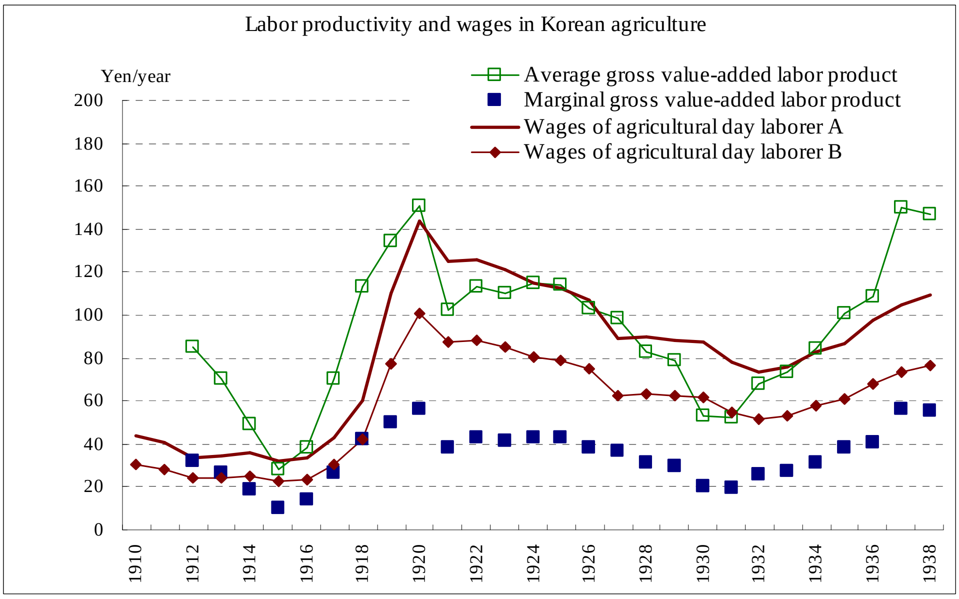
(Source) Suehiro (1997, pp.72-73).

Figure 9.
Disguised Unemployment
in Pre-WWII Japan and Colonial Korea

(A) Japan



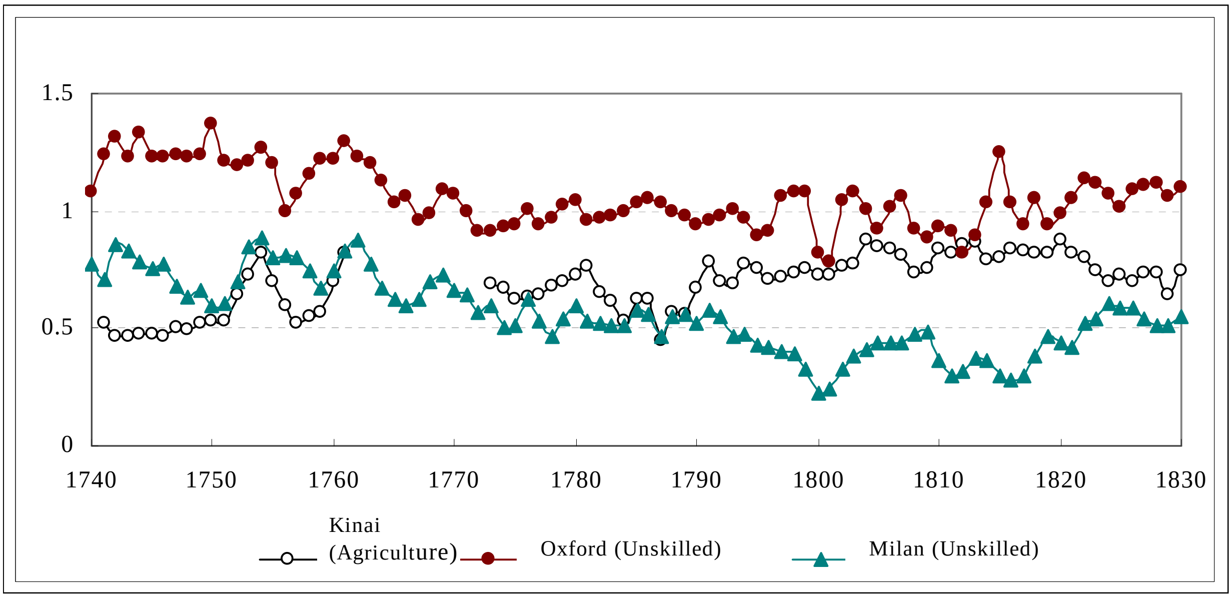
(B) Colonial Korea



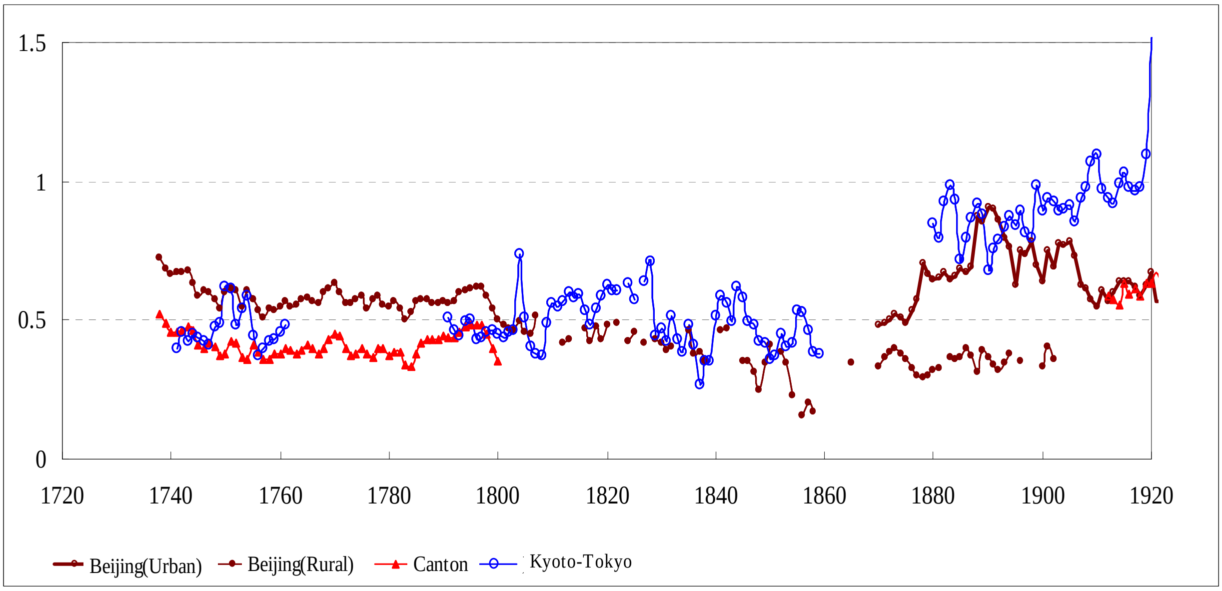
(Source)Odaka and Yuan(2006) .

Figure 10.
Long-term Trend in Real Wages in Europe and East Asia

(A) Kinai, Oxford and Milan



(B) Peiching, Kwantong, and Kyoto

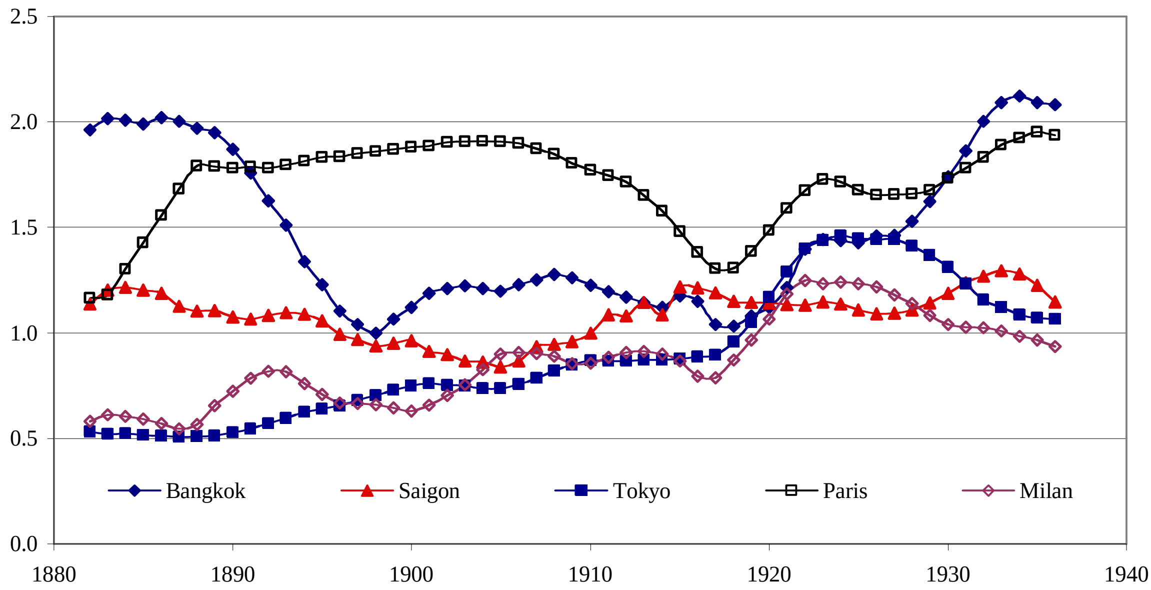


(Note) Kinai is the Kansai region including Kyoto.

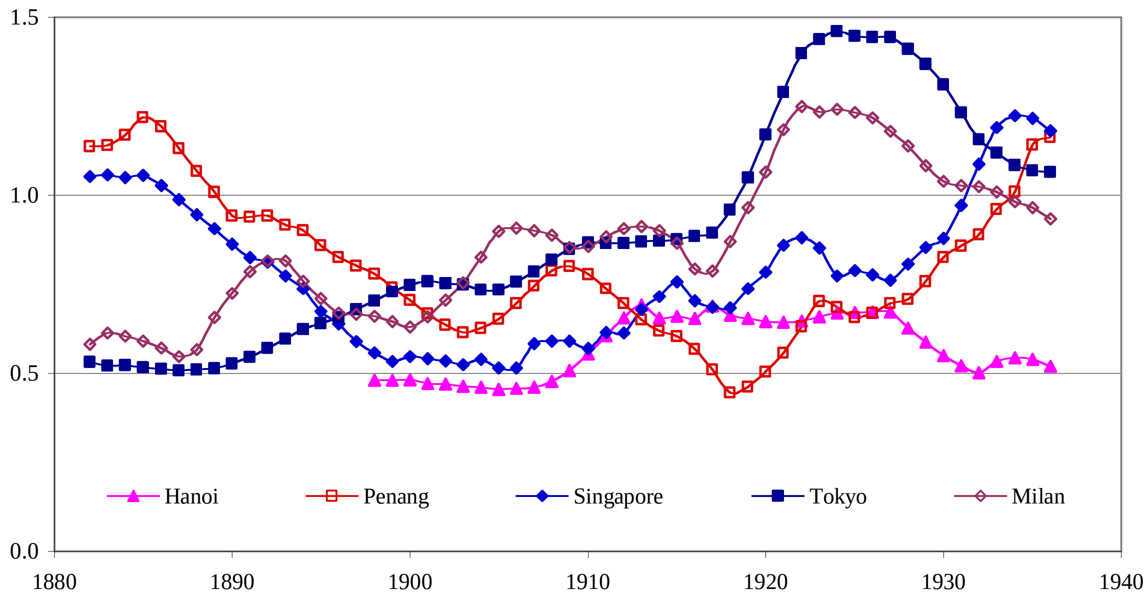
(Source) Bassino, Ma and Saito(2005) .

Figure 11.
Welfare Ratios of Unskilled Workers in Selected Cities, 1882-1936

(A)



(B)

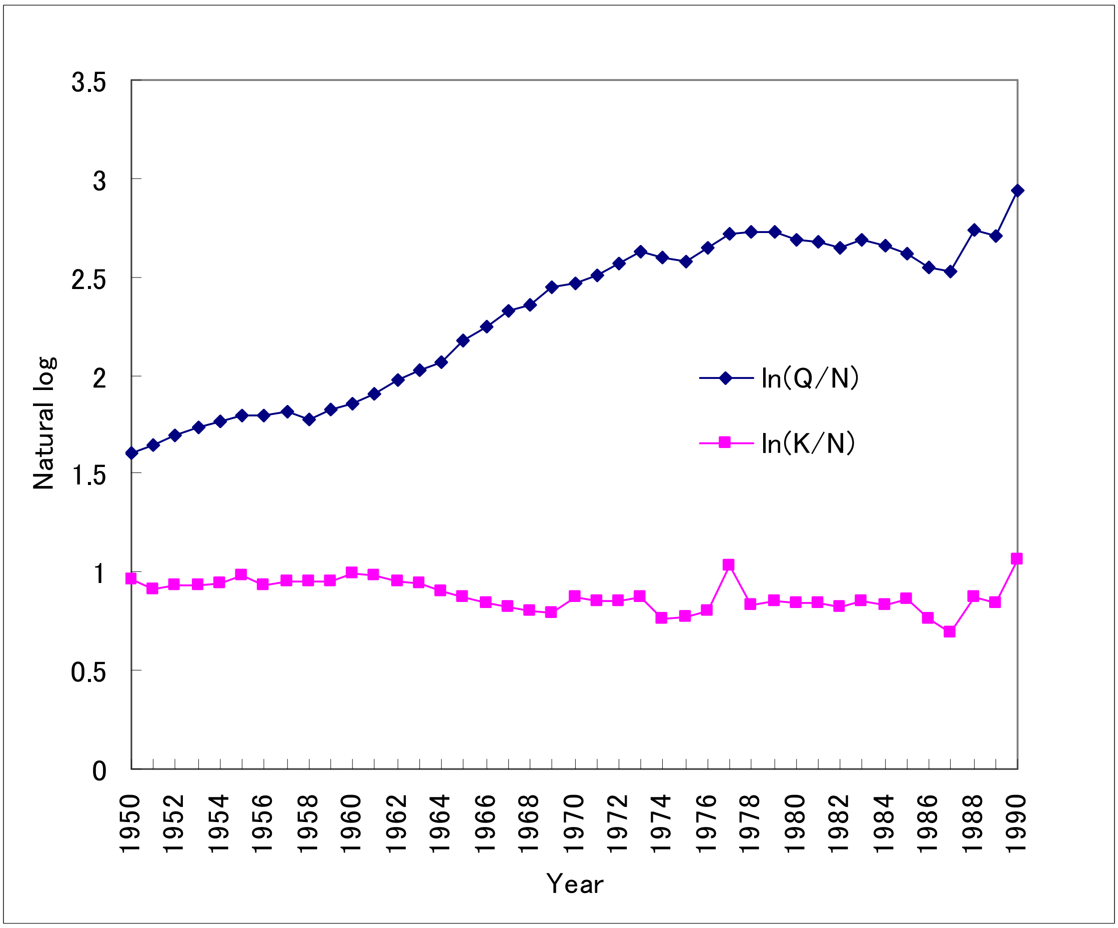


(Source) Bassino and ven der Eng(2006).

Figure 12.

Average Labour Productivity and Capital Intensity

In the Thai Manufacturing



(Source) Shintani (1997).