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Factor Prices in Egypt from 1900 to World War II with International Comparisons

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Factor Prices in Egypt From 1900 to World War II With International Comparisons

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Abstract

The purpose of this paper is for the period ca. 1900 to World War II to map absolute and relative factor prices and their rates of growth for Egypt in comparison with some developed countries, England, France, Italy, and the United States; to throw some light upon the determinants of factor prices in Egypt; and to use factor prices for assessing possible biases in technological change. The underlying data work was substantial; the results are presented in Appendices I to III where among other things an estimate of rent of land in the United States is discussed in some detail. Data problems were very considerable, in particular in relation to the rate of profits. Both definitions and quality varies somewhat as between countries and comparability is in some cases questionable. With these caveats, the basic findings are:

1. Observed international factor price differentials were in some cases huge and measured factor prices were not always highest in developed countries. Rent of land was much higher in Egypt than in DCs, wages for unskilled labor much lower. In these two cases differences in factor quality possibly explain at least part of the international price differentials.

2. Factor mobility clearly tended to strongly equalize returns to financial capital and skilled labor. The apparent similarity of rates of profits to physical capital in Egypt and the United States may be the consequence of adjustments in patterns of trade as HOS-theory has it.

3. While until 1938 real rent of land declined in DCs, in Egypt it increased. For the same period, real wages for unskilled agricultural labor increased strongly in DCs and may at most have increased slightly in Egypt, perhaps even declined. The rates of profits on physical capital may have stayed approximately constant in the U.S. and Egypt at approximately the same level.

4. Relative factor prices and factor proportions did not change systematically in opposite directions in pairwise comparisons.

5. Throughout the period there appears to have been a technological bias in Egyptian agriculture against land and labor in favor of capital.

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Addendum to
Bent Hansen, Factor Prices in Egypt From 1900 to World War II, With International Comparisons, Working Paper No 89-113, Economics, UC Berkeley, June 1989.

1. References to IBRD should be NBER throughout.

2. On pp. 27-8, I emphasize the problem of factor quality and the possibility that the huge differentials between land rent and agricultural wages in Egypt and the US may be a matter of factor quality.

For wages this possibility may be "tested" by applying on of Mincer's (1974, Table 3.3) earnings functions. Assuming, just for illustration that schooling for agricultural labor in Egypt around 1900 was 0 years and in US 6 years, we find that with experience 7-9 years wages in the US should be 2.7 times those in Egypt just as a consequence of different schooling. A second "test" is to compare agricultural wages in the US deep south with the average and assume that the difference is due to the predomination of negro labor with minimal if any education. For the year 1899 monthly agricultural wage in South Carolina (the state with lowest wages) were $7.34 against $14.56 for US agriculture on average (Lebergott, 1964, Table A-24). Both "tests" apparently agree that more than half the differential between US and Egypt could be related to different endowments of human capital (plus discrimination, etc.).

I have not been able to come up with similar simple "tests" for land. Rent itself and yields cannot be used without begging the question. But I am thinking about how to construe "tests".

3. I have overlooked George Stigler's estimates (1963, Table B-1) of rates of return in US manufacturing 1926-58. Although essentially based upon corporate tax returns his results are very similar to those of Christensen & Jorgenson for overlapping years.

Factor Prices in Egypt from 1900 to World War II

With International Comparisons

1. Introduction

Factor prices are interesting because they help us understand a number of key problems in development studies. And they are rare to come by. In small countries factor prices must be viewed in an international context considering trade, factor movements, transfer of technology, and politics.

In this paper I therefore venture upon a comparison of Egyptian factor prices over time and internationally. That the comparison over time largely is limited to the period from around 1900 to World War II is due to the fact that Egypt from World War II, in particular from the Free Officers' coup in 1952, has been held firmly in a straight jacket of governmental controls that made factor prices a matter of bureaucratic intervention more than of market forces. That in the international comparisons United States plays the major role might be considered a peculiar choice. For the period we consider, Egypt's direct economic relations with the United States were not very important. Egyptian-US trade was minuscule and we have no records of labor and capital movements between these two countries. Availability of data was a major consideration and the fascination of comparing extremes probably played a role. Egypt's important trade partners and suppliers of capital and skilled labor, England, France and Italy are included, however, and it will appear that they serve as cases in between Egypt and the United States. In any case, factor prices in

all countries are interrelated directly or indirectly through international trade and factor movements.

The organization of the paper should follow from the list of contents. The main text can be read independently of the appendices.

2. The Situation before World War I

Table 1 is set up for the purpose of cross country comparison of rent of agricultural land, wages in agriculture, building industry and manufacturing, and profit rates in corporate business during the years before World War I. Rents and wages are expressed in terms of U.S. dollars, conversion at par. All data are on an annual basis; assumptions about hours, days and weeks of work are spelled out in the notes to Table 1. The years of comparison ranges from 1897 to 1913, dependent upon availability of data. These were years of increasing prices everywhere and care should be taken with both horizontal and vertical comparison. Exchange rates may, however, for our purpose be considered constant. This is the heyday of the gold standard.

[Table 1]

Factor price differentials across countries vary dramatically. Rent of land in Egypt was 25 times higher than in the United States with England and France in between. The years of comparison even imply an understatement of the land rent differentials. The rates of profit, on the other hand, whether measured by nominal yields or real rates of return on corporate equity were remarkably similar in Egypt, United States and United Kingdom with Egypt highest, the U.K. lowest and the U.S. in between. No information is available for Italy and France but the rate of profit for France may

have been even lower than for the U.K. For wages we notice that relative skill differentials for agricultural and building workers appear to have been large and about the same in Egypt and the United States with much smaller differentials in England, France and Italy. Recalling that all wages in Table 1 are supposed to be full time equivalents for indigenous workers in US-dollars, we find that agricultural laborers, building laborers and skilled building workers in Egypt all earned one quarter to one fifth of comparable American wages. While, on the other hand, indigenous skilled building workers in Egypt generally were paid in line with their counterparts in non-metropolitan France and Italy, unskilled building workers in non-metropolitan Egypt earned 40-50 percent of the earnings of their colleagues in non-metropolitan France and Italy and about 65 percent of those in metropolitan Egypt. Agricultural laborers in Egypt were paid about half the wages of Sicilian and one quarter the wages of English agricultural laborers, the latter being almost on par with American agricultural laborers. For the cigarette industry, one of the few manufacturing industries of some scale in Egypt around 1910, we have wage data for a number of occupations. The highest paid workers in Egypt about 1910 (tube rollers on piece rate)[1] earned about the same as hand-makers in the United States[2] in 1897 and 33 percent more than the best paid workers in the mechanized American cigarette industry in 1903. The lowest paid, adult males (packers) in the Egyptian cigarette industry earned about two thirds of the lowest paid males in the American (mechanized) industry in 1903. There are no data for the American cigarette industry from 1904 to 1929. Wages in US manufacturing industry, however, increased on average by

19 percent from 1903 to 1910 (Hist. Stat., D 740) and wages in the cigarette industry probably also increased somewhat. I have found no information about wages in the English, French and Italian cigarette industries although these were substantial.

Having now provided a bird's eye view of factor prices before World War I, revealing a wide range of differentials internationally, factor prices by no means always being lowest in LDCs, a brief discussion of sources of information and problems of measurement is in order:

i) Rent of Land

Ideally, information about rent of land should be obtained from actual rental contracts, assuming a competitive rental market. There are many problems here. If we are looking for the price of the "use of the original and indestructible powers of the soil" (Ricardo, 1911, p.33) we may be chasing a red herring. The powers of the soil may be neither original nor indestructible. Land may be produced (reclamation and improvement) and is never indestructible (salination, water logging, exhaustion) and location always depends upon transportation facilities. Indeed, "...it is well nigh impossible to conceive of a real problem in which [the Ricardian] notion of land would apply" (T.W.Schultz, 1953, pp.139-41). Nonetheless, it is this red herring students of functional income distribution (including Schultz, incidentally) are chasing. If farm rentals are observed, attempts to deduct for buildings and structures are imperative and even where land rentals can be directly observed the same problem arises for land improvement and free government services (irrigation, drainage, roads, etc.) to come up with the "true", net rental

value. A first condition for rental contracts to serve as a starting point in estimating rental value per acre is obviously that cash rental exists and prevails as a phenomenon of sufficient importance.

In Egypt before World War I cash rental (to some extent combined with service rental in kind and sharing) may have applied to more than half the cultivated area. The estimates of rental value for ca. 1897 were made by a commission under the chairmanship of an outstanding hydraulic engineer and land specialist, W. Willcocks, which as the basis for the land tax, to be levied as a flat percent of land rental, was charged with assessing the market rentals of all agricultural lands. The commission visited every single field (hod) in the country and, apart possibly from particularly poor villages (Willcocks, 1935) does not seem to have been lenient in its assessments as one perhaps might expect from assessments for tax purposes; the intention was, after all, to raise revenue for foreign debt service, a major purpose for the occupation of Egypt by the British. Willcocks' estimates (Willcocks, 1898, pp.17-19) have curiously enough never been used in the literature but are beyond all doubt the major source of information. For the late 1930s estimates of rental value was made by the Ministry of Social Affairs (Amin, 1950, p.759) with no particular policy intentions. I have adjusted all estimates for current government expenditure related to interests, maintenance and operation of the hydraulic system. The results are, to the best of my understanding, highly reliable.

For the United States a considerable amount of detailed work on the official agricultural censuses and surveys led to the averages of land rent presented here. The censuses of 1940, 1930 and 1920 (with a special

USDA-study for 1920) collected information about contractual cash rents for land and buildings paid or payable from cash tenants. Since there is no reason to assume that land and buildings actually rented should be an unbiased sample of all lands and buildings, I followed an old suggestion by the USDA and assumed that within a given locality the cash-rent/farm-value ratio would be the same for cash leased and all other farms. This assumption was then applied directly to the 1940 and 1930 censuses. For 1920 the census information about cash rents was never tabulated and a special study by the USDA in 1924 based on questionaires sampled from the 1920 census unfortunately, as they did at that time, operated with an "old-fashioned" sample of so-called representative counties from districts that were thought to be homogenous in various ways. The biases involved, partly related to the distinction between white and non-white tenants, created serious problems for the estimate of land rents for 1920. Despite such biases it was assumed, with what justification is uncertain, that the information from the survey might be used for gauging the rate of change of land rents between 1920 and 1940. For the period 1900-20 only small surveys for a few Mid-West states exist, reliability and representativeness being greatly in doubt. Finally, estimates of shares of agricultural land services as a percent of total inputs in agriculture have been made by the USDA for selected years between 1910-14 and 1950 (reported by T.W.Schultz, 1953, pp. 137, 212-13, 302). How these approaches were applied and consolidated in estimates of nominal and real land rent in the United States 1900 to 1940 is explained in detail in Appendix I, see in particular Table I.4. Obviously a good deal of ad hoc assumptions had to be applied

but they should not bring in doubt the very low level of land rent in the United States as compared with England and France, not to speak about Egypt.

For France and England-Wales, I relied entirely upon existing literature, in particular estimates by Proctor Thomson (1951) made available by T.W.Schultz. Problems with gross and net rent seem to be particularly serious for England-Wales; for details see Appendix I.

By and large, leaving the enigma of Ricardian land aside the problems involved in measurement of (agricultural) land rent for our four countries do not seem disturbing. It should perhaps be emphasized that no attempts have been made to measure urban land rents.

ii) Wages

Apart from the cigarette industries, information about wages is mainly based on official data and for the four DCs I refer to the relevant official publications. The information is incomplete and not very satisfactory for any of the countries. For Egypt, Table 2 is included partly to indicate important trends before World War I, partly to bring in yet another dimension of the national labor market, the distinction between indigenous and foreign, resident workers.

[Table 2]

In Egypt at that time, resident foreign workers were typically highly skilled and paid. Thus the skilled workers (with management) in that part of the cigarette industry for which data are given in Table 1, were predominantly Greeks (from Istanbul and Anatolia). In the building industry in metropolitan areas foreign workers (mainly Italians and Greeks) may have

been the majority of skilled workers. One fifth of the total labor force in building in 1907 were foreigners. The share of skilled building workers must have been much higher, in particular in Alexandria, Port Said and Cairo. For a typical occupation, brick masons, in Alexandria foreigners in 1903 earned 25 percent more than indigenous workers; in the Delta the difference was 60 percent. In 1913 these differentials had shrunk to 11 and 45 percent, respectively, wages of foreign masons in Alexandria even declining absolutely in nominal terms (in terms of consumer goods the decline may have amounted to about one third). We shall discuss the causes of these disparate developments for foreign and indigenous, skilled and unskilled, metropolitan and Delta workers in Section 4. At this moment we shall extend the international comparison to Italy, a substantial part of the foreign skilled building workers being Italian immigrants of recent origin.

[Table 3]

Table 3 shows nominal and real wage differentials for foreign masons in Alexandria and Italian masons in Italy, 1903-13. A large differential of 61 percent in favor of Alexandria in 1903 had in 1913 almost disappeared in nominal terms and in real terms been reversed into a differential of 14 percent in favor of Italy. For laborers the differential in favor of Alexandria was at best negligible and may even have been negative for the whole period (Hansen, Oct. 1982, pp. 7-8).

Assuming wages for laborers in the building industry inside the Delta to be indicative of agricultural wages in so far as the rate of change is concerned (this is, indeed, what we assumed in Table 1 to be able at all to

construct agricultural wages for 1903), Table 2 shows that while in real terms rent of land increased considerably (1.3 percent p.a.) from 1903 to 1913, real wages declined (-0.7 percent p.a.). I suspect, without other evidence than the nature of the data, that the absolute rates of change for both rent and wages may be exaggerated although signs probably are correct.

iii) Profits

What we are looking for is the rate of profits earned by real (physical) capital. This is what, for instance, HOS-theory is about. Attempts to estimate rates of return to physical assets have been made by Christensen & Jorgenson (1973) for the United States 1929-69. Christensen & Jorgenson base their estimates upon national accounting data which are not available for Egypt. Kendrick & Sato (1963) have, on the basis of Kendrick (1961), also starting out from national accounting data, estimated "real income per unit" of physical capital for six years from 1899 through 1957. Once more, methodological problems apart, available data for Egypt do not permit such estimates. Friedman & Schwartz (1982, Ch.6, pp.274ff), finally, have used the rates of growth of nominal and real national income as proxies for rates of return to physical capital. The theoretical rationale for this method of procedure is von Neumann's model of general equilibrium growth (Friedman, 1974, p.37, n.22). We have no real national income estimates worth the name for Egypt before the late 1930s but various indicators suggest near-stagnation of per capita income which on the von Neumann model would imply a low rate of profits of the order 2 percent. Be that as it may, we are left with only two possibilities for Egypt:

One is to use information about dividends and stock market prices

for corporate equity to determine real rates of return to corporate equity defined as rate of yield plus rate of capital gain or loss from stock market price changes during the holding period considered minus the rate of inflation. This has been done by Ibbotson & Sinquefield (1976) for the United States 1926-74. Common stock indexes for the United States published by Cowles (1938) permit the method to be applied to the period 1871-1936. For the United Kingdom we have such estimates for the years 1870-1913 by Edelstein (1982). Here, fortunately, we do have comparable information for Egypt 1903-38, and this is then how we shall first proceed. Whether this really is a way to obtain a proxy for the rate of profit on physical capital is another matter which shall be discussed later.

The other possibility is to use corporate business accounts. Such data exists for the US back to 1914 and for Egypt back to 1911.

a) We start out then by computing real rates of return to equity. Let it first be mentioned that for the U.S. application to the years of overlapping, 1927-1938, of the Cowles material (common stock traded or listed on the New York Stock Exchange) and the Ibbotson-Sinquefield material (500, before 1957 90 of the largest stocks included in the Standard and Poor composite index) yields practically speaking identical results on an annual basis (see Table II.9). Hence, for the United States we shall use the results of Ibbotson-Sinquefield for the period 1927-38 while results based upon the Cowles material are used for 1897-1913 and, for a special purpose, 1927-36.

Egypt have had organized stock exchanges in Alexandria and Cairo since 1902(03) and before that there was trading on the curb (Crouchley,

1936). Unsystematic newspaper reporting of market quotations goes back to the 1890s. For the years 1900-09 and 1913, nonetheless, the necessary information about both dividends and stock market quotations for common stock (actions ordinaire) could be found only for five companies, all big and well-established. A reasonably reliable COL-index has been estimated for the years 1903-13 (Hansen, unpubl.). For 1913 and the years 1925-38 official monthly data exists for companies traded on the stock markets and an official monthly COL index is available for years after 1913. Hence yields and real returns to equity could be computed for five companies 1903-09 and 1913 and for a larger number (37 to 60) for the years 1913 and 1927-38. Needless to say, the information about Egyptian companies is far from ideal. At the price of a considerable loss of companies, the estimates could have been extended to include 1925 and 1926. This was not found worthwhile.

For the United States detailed results are shown in Appendix Tables II.7, 8, and 9 , all on an annual basis and for selected periods. For Egypt corresponding results are shown in Tables II.4 and 5. All results are summarized in text Table 4, A and B (see also Table 5), which also includes comparable estimates for the United Kingdom 1897-1909 and 1910-13 as presented by Edelstein (1982). I have not been able to find or make similar estimates for France or Italy.It may quite well be possible. Germany is another possible candidate.

[Table 4]

[Table 5]

Table 4. A and B with Table 5 show both nominal yields and real rates of return for Egypt, U.K. and United States. Since, of course, investment in equity is financial investment we have, for the sake of comparison included nominal yields and real returns to British consols, American high grade municipal bonds and Egyptian government bonds (emprunt garantie). Aiming at the rate of profit on real, physical capital, rational expectations theory suggests that we should concentrate upon real returns to equity. These are strictly ex post returns but should in long term equilibrium coincide with ex ante returns which ideally should tend to coincide with returns to physical capital, disregarding risk and uncertainty. The concensus, at least a widespread opinion, seems, however, to be that for the period studied here consumer and stock market price developments were not generally anticipated (see for instance Friedman & Schwartz, 1982, pp. 490-97) and that, apart possibly from times of special events (war financing, say), static expectations may have been the rule rather than the exception. With this possibility in mind we have good reasons for paying attention also to nominal yields.

We notice first then that nominal yields to both American and Egyptian corporate equity, not only for the sub-periods singled out in Table 4.A but also on an annual basis, were very stable throughout the whole period 1897-1938 and until 1913 were closely associated with nominal yields for British consols, the default risk-free financial investment at that time, as well as for American and Egyptian bonds. Nominal yields to consols as well as American and Egyptian equity increased slowly and steadily from 1897 to 1913 with a margin of 1.5 to 1.8 percentage points

between American equity and consols and a slightly higher margin of 1.9 to 2.1 percentage points for Egyptian equity. These margins presumably express risk factors, the risk factor being higher for corporate equity than for British public debts and higher for Egyptian than for American equity.[3] For the inter-war years 1927-38(6), however, with higher average yields to consols and about unchanged yields to both American and Egyptian equity as compared with the pre-1913 period, the risk margin declines to about ½ percentage point for American equity and slightly above 1 percentage point for Egypt. Exchange rate depreciation for Sterling in terms of US$ might be the explanation of the decline in the American margin vis-a-vis consols; but Egypt as a member of the Sterling-bloc remained firmly on a Sterling basis and with the margins for both American and Egyptian equity declining about equally we may have to look for other explanations.

The relative stability of nominal yields is in sharp contrast to the high degree of volatility of real rates of return to equity, in particular on an annual basis. For American equity we have fluctuations between +54 percent in 1933 and -34 percent in 1931 (Table II.8) and for Egyptian equity and for pre-1913 years (Tables II.4 and 5) fluctuations are also dramatic. Unless the focus is on short term developments, which it is not here, averages for longer periods should be used as we have done. Notice that the volatility of annual real returns as compared with nominal yields is due almost exclusively to the volatility of stock market prices, the rate of inflation (deflation) fluctuating only moderately for the periods considered here. The volatility of real returns to consols and other bonds was less than for equity but was by no means negligible. Annual real

returns to consols fluctuated between +24 and -23 percent during 1927-38 and even for the calm years before 1913 we find fluctuations between +6 and -10 percent.

Even for longer periods, however, we find much less regularity for real returns than nominal yields, Table 4.B. For consols, real rates of return before 1913 tended to behave much the same way as nominal yields; from -0.7 percent for 1897-1909 and 0.3 percent for 1903-09 real returns increased to 2.6 percent for 1910-13. For equity real returns behaved very differently before 1913. Starting out from the estimates for the United Kingdom we find almost constant, if anything slightly declining real returns from 3.0 percent 1897-1909 to 2.8 percent 1910-13 totally. The breakdown on foreign and domestic equity, however, gives strikingly different results. While for domestic equity real returns increased from 0.9 to 6.4 percent, for foreign equity traded in the UK it declined sharply from 9.5 to 1.4 percent. Notice, moreover, that while the increase for domestic equity qualitatively matches that for consols, the decline for foreign equity corresponds closely to developments for American equity in the United States where real returns declined from 10.1 to -1.5 percent with Egyptian equity in Egypt showing a somewhat smaller decline from 1903-09 to 1910-13. Edelstein (1982, pp.146-57) who presented the estimates of real returns to equity for the U.K. for 1870-1913 refers here to established opinion amongst scholars about countercyclical developments in the UK and the Rest of the World, in particular the United States, related to the so-called Kuznets cycles. With practically speaking free financial capital movements before 1913 it remains difficult to understand how real

returns could develop so differently for two categories of equity unless, of course, the measures used here, real returns to equity on a one year holding basis misses something essential. This something can only be - the future; and this leads us again to the problem of antecipations.

For the inter-war period developments were again very different. Real returns increased strongly for bonds as well as for American and Egyptian equity as compared with pre-1913 years (for the United Kingdom we do not have real returns to equity for interwar years) but while 1903-13 real returns to Egyptian equity if anything were slightly higher than for American equity, for the period 1927-38 the situation was reversed. And while for 1903-13 real returns to consols were much lower than those to both American and Egyptian equity, 1927-36 all three were approximately in line.

Table 4, B, the lower panel, shows a decomposition of the real rate of return for bonds as well as equity by nominal yields, rates of capital gains from increased stock market prices, and rate of gain from inflation, together adding up to real rates of return, for the two periods 1903-13 and 1927-36. Inspection of the decomposition leaves no doubt that we are faced with the so-called Gibson Paradox: that levels of nominal interests (returns) and prices moved up and down together over long periods until the 1970s when the contemporary text-book picture suddenly took over: levels of nominal interests (returns) becoming associated with rates of inflation. During the interwar years (1927-36) we find relatively high nominal interests (yields) combined with substantial capital gains related to increasing stock market prices and deflation, together establishing the

very high levels of real returns (students looking for the causes of the great depression should take notice of that). The pre-war years, 1903-13, on the other hand, experienced relatively low nominal yields, further reduced by capital losses related to decreasing stock market prices and inflation (Egypt the single exception in experiencing stock market gains, dominated, however, by inflation, due to the common cause, strongly increasing cotton prices). We shall not here go into the possible explanations of the Gibson Paradox. Leading economists from Wicksell via Keynes to Milton Friedman have offered a variety of explanations (Friedman & Schwartz, 1982, pp.546-69). Rational expectations apparently did not prevail before the 1970s.

The almost identical developments of nominal yields and real returns, respectively, for bonds and equity over the long period from the (last) turn of the century to World War II in U.S.A., U.K., and Egypt clearly suggests relatively effective international arbitrage and trade in financial assets. That returns to financial assets have tended to be equalized internationally does not necessarily mean, however, that returns to physical capital have been equalized or even that returns to physical capital have moved with returns to financial assets. This is the problem we must address.

b) Corporate business accounts or, rather, aggregates of such accounts is a second possible source of information about the rate of profit on physical assets albeit, obviously applying directly only to the corporate sector. For the United States we have here partly rates of earnings estimated by Cowles (1938) partly a sample by the NBER of large

enterprises in manufacturing going back to 1914 (Historical Statistics, Series V285-305) and for Egypt official statistics with systematic tabulations going back to 1911. For Egypt the published statistics contain no information about assets and profit rates have to be calculated upon selected liabilities. We may here measure profits (dividends plus increase in reserves) either on own capital (paid-up equity plus reserves) or all payments to capital (dividends plus increase in reserves plus interest payments) on total capital (own capital plus debentures). From our point-of-view the latter is preferable. For the United States we may in addition measure profits on bookvalue of fixed real capital plus inventories. All these measures are at best proxies to what we are looking for. Appendix II contains our detailed findings, for Egypt presented in Tables II.1-3, for the United States in Table II.6. A summary is presented in Table 6, see also Table 5, Col.s 7 and 8.

[Table 6]

Concerning the level of the profit rates in the two countries we are also facing difficulties. For the years before World War I and for 1928-31 the levels of the IBRD sample and the Egyptian company statistics are remarkably similar: some 5-6 percent for 1911-14 and 7-9 percent for 1928-31. For 1934-38, however, the IBRD sample remains at a high level of 7-8 percent while the Egyptian companies slip down to 3.7 percent. For this period the profit rate for all U.S. corporate business on the other hand was only about 2 percent. We do not know what the profit rate for all U.S. corporate business may have been for earlier years and the IBRD sample may simply not have been representative. The adjusted Cowles' series runs for all years at a lower level than both the IBRD series and that for all U.S. corporate business but then the construction of the original series is not clear; the Cowles volume tells nothing about the sources of the earnings data and our adjustment may not be successful. Everything considered, there is nothing in the U.S. data that excludes the possibility that the profit levels may have been about the same for the whole period but this must at best remain an uncertain conjecture.

iii) Summarizing, it is natural to take F.& S. (1982) as a starting point. These authors have looked carefully into the problem from their own point-of-view. In search for a proxy to returns to physical capital as an explanatory variable of demand for money (velocity) over their very long period of investigation (almost a century) the authors, as already mentioned selected the rate of growth of national income (nominal and real). This proxy worked remarkably well in econometric estimates of velocity but the authors, understandably, felt a need of supporting their choice of proxy by comparing rate of growth with rate of return to property as estimated by C.& J. (1973, Table 9) and with rate of return to common

stock as estimated by I.& S. (1976, Tables 1 and 5) for overlapping periods, that is for 1929-69. The basic results are presented in F.& S. (ibid. Table 10.2 with text) and the authors emphasize the close correspondance between the mean of their growth rate indicator and that of the rate of return to property for the private economy estimated by Christensen & Jorgenson with some positive, statistically significant correlation between the two series (annual data) but on the other hand a big gap between the mean of rate of returns to equity according to I.& S. and the means to income growth rates as well as C.& J. returns to property and no correlation worth talking about. For our purpose these results are of interest because they would seem to indicate that it should not be possible to infer from rates of return to equity to rates of return to physical capital and because one of our pieces of information about Egypt is about returns to financial capital, equity and bonds. Several circumstances should, however, temper this conclusion.

First, F.& S. make no use of the real rate of return estimates for physical capital by Kendrick (1961) for 1899-1957 and stock market indicators by Cowles (1938) for 1871-1937. It has to be admitted, however, that the Kendrick estimates might have been of little help to F.& S., covering only six so-called key-years, 1899, 1919, 1929, 1937, 1948, 1957 and presenting only an index of the rate of return. Although Kendrick & Sato (1963) do conclude from these six observations that there is no trend in the rate of return to physical capital, these estimates do not help to determine either mean rate of return or correlations. The Cowles data, on the other hand, lead to almost identical real rates of return to equity as

those of I.& S. for the years of overlapping (1926-36) but if the I.& S. estimates are not applicable, extrapolation through the Cowles data would not be applicable either. Important is, however, the fact that the C.& J. estimates refer to after tax rates of return to property. For the purposes of F.& S., after tax returns may be in order (this is the opportunity costs of holding money although they should then logically use after tax short term interests also in their money demand functions); we, however, need before tax estimates. Adjusting for taxation in 1958 (C.& J., ibid. Table 8), C.& J.'s real rates of return for the corporate sector becomes almost identical with the I.& S. real returns to equity, 8.9 against 8.8 percent (see Table 5).

Considering, moreover, the fact that F.& S. do not take into account the impact upon the rate of interest in a von Neumann-setting of so-called extraneous consumption and population growth (Malinvaud, 1959; Morishima, 1961; Solow, 1962) the gap between properly adjusted growth rates and real returns to equity may diminish with a gap between adjusted growth rates and real returns to property as measured by C.& J. emerging. Adjusting growth rates and returns to property for these factors would, at least for years after World War II, tend to make the means for growth rates, rates of return to property, and rates of return to equity begin to converge. For inter-war years, however, both taxation (C.& J., 1969) and extraneous (public) consumption were considerably lower and substantial gaps between adjusted means would probably prevail.

As far as correlation is concerned it may be argued that correlation on an annual basis is of minor importance from our particular

point-of-view. Correlation by periods about the length of a decade is what we need, given the Egyptian data. As Table 5 clearly shows, however, even for decades the volatility of real returns to equity makes this an unreliable proxy for returns to physical capital in the United States.

F.& S., finally, make no attempt to use the corporate business accounts refered to above. These might, as we saw, have been used for obtaining indicators of the profit rate in the economy as a whole.

For the United Kingdom we have for the period before World War I two sets of estimates of returns to capital, Edelstein's (1982) estimates of real returns to equity, already mentioned and conceptually identical to the I.& S. (1976) estimates for the United States, and the Davis & Huttenback (1986) estimates that aim at measuring returns to physical capital. This supplies us with yet another way of looking into the possibility of using real returns to equity as a proxy for returns to physical capital. D.& H. operates with several concepts of return to capital and their exposition is at this point somewhat confusing.[4] If I am not mistaken, their concept of "rate of return to all capital claims" (ibid., p.106) comes close to C.& J.'s concept of real return to property for the corporate sector, before tax, to be sure, but that is actually what we are interested in. Table 7 compares then Edelstein's real returns to equity, averages for 1870-1913, and D.& H.'s rate of returns to all capital claims, averages for 1870-1912, with breakdowns on domestic and non-domestic activities as well as subperiods. To obtain non-domestic and total activities in the D.& H. estimates we have weighted domestic, foreign and empire activities by the weights 0.30, 0.45, and 0.25, respectively, as indicated by the authors

(ibid., pp.71-2).

[Table 7]

For the long period 1870-1912(3) we obtain quite similar results as those obtained in the comparison in Table 5 between the C.& J. and the I.& S. estimates for the corporate sector in the United States. Considering taxation in the United States, in both cases real returns to equity appear to be a couple of percentage points above real returns to physical capital, again probably related to risk. For shorter periods, about one decade, the returns for the total samples show a much larger similarity than we found for the United States in Table 5, and both measures indicate a tendency for the real rate of return to decline. If Egypt resembled the United Kingdom more than the United States in this regard one might perhaps feel tempted to conjecture about the real rate of profit to physical capital on the basis of the real rate of return to equity for Egypt.

What then, if anything, dare we conjecture about the rate of profit in Egypt from the (last) turn of the century to World War II - given our very limited information from corporate business accounts and about nominal yields and real returns to long term bonds and equity? Let us give it a try! To do that let us first put together the main results in Table 8.

[Table 8]

Given the deficiences of our information the table is divided into two panels, one comparing the immediate years before World Wars I and II, another one the decades before the wars. The information from corporate business accounts is best in the first panel while the second panel is more likely to disclose long term tendencies. Table 8, nonetheless, contains

sufficient information to make it possible to discuss real rates of returns to corporate equity in terms of so-called market fundamentals, viz. real rates of interest on the one hand and corporate business profits on the other, and conjecture about the long term development of the latter.

In the lower panel the increase in the returns to equity for both the U.S. and Egypt is compatible with the increase in real rates of interest and the downward tendency of the rates of corporate profits in both Egypt and the U.S. In the upper panel the decline in the real rate of return to equity for Egypt fits very well with the decline in both real rates of interest and corporate profit rates. For the U.S., however, the picture is confusing; the strong increase in real rate of return to equity contradicts the decline in both real interests and corporate earnings rates (Cowles) but agrees with the strong, albeit not well documented (see above) increase in corporate profit rates (IBRD-sample).

While there is thus something in the picture to indicate either long term increase or decrease in the rate of profit to the corporate sector in the U.S., for Egypt there is just nothing to suggest an increase. If anything a slight decline in the corporate rate of profit in Egypt appears to be a possibility. The evidence is, however, highly circumstantial and much dependent upon the choice of periods. I do not think there is sufficient evidence to challenge the concensus view that the rate of profit to physical capital in the United States had no trend at that time and for Egypt it must be kept in mind that the corporate sector at best tells us something about the modern sector. Profits possibly fell here but what happened in the traditional sector is an open question.

3. Factor Price Developments - 1900 to 1938

Table 7 then shows our results concerning the development of factor prices in terms of both US$s and real local currency for land, agricultural labor and capital from the beginning of the 20th century to the late inter-war period. The contrast between the development in the DCs and that of Egypt is striking.

[Table 8]

While in terms of both US$s or real local currency rent of land in Egypt increased, France, England and the United States experienced a decline. Simultaneously, real agricultural wages increased considerably in all three DCs with Egyptian wages increasing little and possibly even declining. The rate of profit on physical capital is, as should be abundantly clear from the preceding section the weakest point in the study and for the United States and Egypt we are left with conjectures. The weak evidence, mainly or exclusively referring to the corporate sector and partly referring to returns to financial capital in this sector, does not contradict the concensus opinion that there was no definite trend in the rate of profit in the United States and it might be claimed that the same was the case in Egypt, at least in the modern sector.[4a] Recalling that our interest is the trend for this period, through its business cycles including the Great Depression, I would personally be inclined to adopt this view. At given factor quantity developments these factor price developments (considering especially the very unequal distribution of land in Egypt) would then indicate increased equality of income distribution in the DCs with increased inequality in Egypt in accord with Kuznets' U-curve.

4. Factor Price Equalization

Theory assumes, to simplify somewhat, that under autarky, international differences between domestic relative prices for identical factors may be ascribed to relative domestic factor endowments which, at "neutral" technology differences and given identical preferences, determine relative factor productivities, whereas overall international differences may be ascribed to differences in total factor productivity. The same theory holds that in open economies three forces tend to equalize prices for identical factors internationally: factor movements, commodity trade, and transfer of technology, while "distortions" (anything preventing perfect competition from prevailing, "market failures" and, in particular, government interference with the markets) are obstacles to such equalization.

Our first problem is then whether our information about prices really refer to identical factors? We operate with simple aggregates, land (acres), capital (£E), and a few categories of labor (numbers). An average Egyptian acre is probably something very different from an average American acre. The difference in observed rents of land might just reflect differences in quality, that is fertility or location. And even if averages were equal, distributions around the average might differ, in theoretical parlance, factors might not be homogeneous. If so, theory is faced with index problems, more often than not ignored by pure theory. As an indicator of the heterogeneity of land as a factor of production we might (thereby in a sense begging the question!) take the coefficient of variation of (average) rentals by state in the United States and by moudirieh in Egypt.

For the 48 states in 1940 the coefficient was 65.1 percent; for the 15 non-metropolitan moudirichs in 1910 (calculated on the land tax which was proportional to assessed rental) it was 35.5 percent, indicating much less heterogeneity in Egypt than the United States as one would expect. For labor we have similar problems and educational status might perhaps have to be taken into account for comparisons to become theoretically meaningful. We should perhaps compare wages of rural laborers in Egypt with those of blacks from the rural Deep South? Possibly the Greek-Anatolian tube rollers in the Egyptian cigarette industry had human capital comparable to that of hand-makers in the American industry (perhaps even being immigrants of the same stock) with comparable earnings. And what is identical physical capital?! Cotton steam presses in Egypt were greatly superior to those in the United States (reference); for cotton textiles machinery the opposite was the case (Tignor (1982). This paragraph just serves to demonstrate that the author is terribly aware of a problem more often than not swept under the rug in factor price equalization studies.

Concerning market failures, she was still to some extent a subsistence economy, but, on the other hand Egypt was until World War II an unusually distortion-free economy in the sense that government intervention with the market forces was minimal, much more so than in the three DCs considered here. One major government intervention in Egypt was, however, the tariff reforms of 1930 which according to 2x2HOS-theory should increase returns to capital and be harmful to labor and here we could mention also Smoot-Hawley of the same year in the United States having in principle effects in the same direction on relative international factor prices (with

some qualification for the Leontief-paradox). Considering the composition of Egyptian trade with the United Kingdom (exports almost exclusively baled cotton sold in the Liverpool market) and the Egyptian membership of the Sterling bloc, British distortions were of less consequence for Egypt.

Since Egyptian factor prices (ignoring the problems of factor quality and homogeneity) were not generally lower than factor prices in the DCs (considered here), indeed, rent of land was much higher in Egypt and wages for certain skilled labor were on par, we cannot draw any conclusions about general productivity on the basis of our factor price data alone, either for 1900 or 1940. The production functions for Egypt and the rest of the world could have been the same. Looking at the growth rates of factor prices from 1900 to 1940 we have the same problem. The international differentials between Egypt and the DCs for rent of land and unskilled labor widened sharply in opposite directions. Differentials for foreign skilled building workers in favor of Egypt (as compared with Italy) disappeared on the other hand already before World War I. The differential between profit rates changed perhaps little. It would seem thus that Egypt experienced a relative fall in all factor prices except rent of land and possibly the rate of profits which again leaves us in uncertainty about the development of general factor productivity. The attention is thereby drawn to factor proportions.

Factor proportions are reasonably well known for agriculture in both Egypt and the United States for the period in question. With perfect domestic mobility of capital and labor it should play no role that we have only data for agriculture. They tell us the same story about relative

factor abundance and scarcity as do relative factor prices (Table 10). While in the comparison between agriculture in Egypt and the United States, labor in Egypt was abundant in relation to both capital and land with capital abundant in relation to land, for the United States the opposite held true, by definition: labor was scarce in relation to both land and capital with capital scarce in relation to land. It comes as no surprise that in Egypt labor was abundant in relation to land and capital and in the United States scarce in relation to land and capital. Cultivation in Egypt was both more labor and more capital intensive than in the United States. It may be surprising, however, that there was more capital per acre in Egypt than in the United States. Substantial though the problems are in measuring factor quantities, I do not think that we are here up against a data artefact. That traditional irrigation agriculture quite often is relatively capital intensive is a point made by T.W.Schultz years ago.[5]

[Table 10]

From Table 10 we find that the rent-wage ratio increased in Egypt while it fell in the United States. The land-labor ratio fell in Egypt while it increased in the United States. The profit-wage ratio fell in the United States; what happened in Egypt is not quite clear but the possibility that it may have increased cannot be ruled out. The capital-labor ratio increased in both countries. The capital-land ratio increased in both Egypt and the United States while the profit rate-rent ratio fell in both countries. The simple correspondance between relative factor proportions and factor prices is, of course, to the extent it actually exists, fortuitous considering all possible exogenous events

(factor biased technology changes, distortions, and what not). And in one case it possibly fails. The general picture does suggest, however, that it is in the land-labor ratio that we find the main difference between developments in Egypt and the United States.

Under autarky, knowledge about factor prices and factor proportions would help to infer about the nature of technology change. This is so because factor proportions inform us about relative average productivity while factor prices (under ideal competitive conditions) inform us about marginal productivities and this information may suffice for inference about factor biases in technological change. With a production function $Q = Q(L, A, K, t)$ and obvious notation we have the relative shares

$$\frac{Q'_L L}{Q} \Big/ \frac{Q'_A A}{Q} = (Q'_L/Q'_A)(L/A)$$

so that for any two factors, relative factor price times factor proportion equals relative factor income shares. From Table 10 it follows that while share of capital increased in relation to both share of land and share of labor we cannot say whether share of labor increased or decreased in relation to share of land; our information about the development of wages is unfortunately too imprecise. Had Egypt been living under autarky, technological change would in this sense have been biased in favor of capital, technological change being labor and land saving in relation to capital. The key words here would probably be irrigation, cotton and chemical fertilizers. Egypt, however, was not living under autarky. Trade was large and pervasive and with trade even this weak inference may not hold (see below). With free trade under perfect competition, constant

returns, two factors and two commodities with different factor intensity and factor intensity reversal as well as specialization excluded, factor prices are determined by commodity prices as given from abroad. In this ideal scenario, factor proportions become decisive for functional income distribution and patterns of trade with no bearing upon factor prices.

Of the three equalizing forces, factor movements undoubtedly played a role in equalizing returns to financial capital, possibly also the rate of profit on physical capital and certainly real wages for skilled building workers in Egypt before World War I. Increased security for foreigners efter the establishment of the Mixed Courts in 1875 and the presence of the British from 1882 with, after 1897, a strong persistent increase in cotton prices and improvement of the terms of trade brightened business prospects generally and induced a large inflow of both foreign financial capital and skilled labor (including management). Rapidly increasing demand for modern, European style housing and plentiful supply of financial capital together created a building boom that developed into a typical, but local Kuznets cycle, parallel but unrelated to the simultaneous Kuznets cycle in the United Kingdom.[6] A speculative bubble in equity and land accompanied from 1903 to 1905-06 the increase in cotton prices and over-extension of credit from a number of private commercial banks resulted ultimately in the financial crisis of 1907. Spectacular though this Egyptian bubble was (in its upswing it compared well with the 1929-bubble in the United States), its collapse with the financial crisis was a temporary financial phenomenon without lasting consequences, no different from parallel financial crises in other countries in 1906-07 and the literature on Egypt tends to

exaggerate its importance. Of real consequence was the levelling-off of cotton prices after 1907, the completion of a general financial portfolio restructuring in the country with mortgage loans on a large scale absorbed by prosperous landlords for financing urban development, and the satiation from 1908 of demand for modern housing from foreigners and absentee landlords with vacancies of apartments and stagnating, even falling rents in modern housing the result. The outlets for profitable investments in physical capital were in this way severely curtailed until World War I; returns to equity declined (Table 5, Col.4) and the inflow of financial capital slowed down dramatically. Not until the late 1920s did the situation change when the impact of the international agricultural crisis and the Great Depression on terms of trade and relative factor prices with the tariff reform of 1930 and its announcement effects led to a strong increase in the rate of profits, ex ante as well as ex post, as already suggested.

The inflow of Italian and Greek building workers was closely geared to these developments. It stands to reason that already in the late 1890s, the increase in demand for modern European style housing increased the demand for and, hence, the wages of building workers trained in the construction of modern residental buildings and that naturally meant foreign workers. This would explain the emergence in the late 1890s of a differential between foreign and indigenous, skilled building workers' wages, the latter specialized in traditional building designs and methods. The inflow of foreign building workers and the shift in demand for housing together would tend to decellerate the increase in wages for building

workers generally and may even have caused a decline in wages for foreign building workers before the building boom finally broke in 1908. It is probably significant that building worker wages continued to increase inside the Delta and Upper Egypt with wages of indigenous workers here increasing more strongly than those of foreign workers (Table 2). The collapse of the building boom in 1908, indeed, the whole Kuznets cycle in Egypt was very much a foreign community, metropolitan (i.e. big city) affair. Foreign community demand for housing became satiated and it was the foreign community that was hardest hit by the breakdown of the boom. Immigration of foreign building workers seems to have ceased after 1907. Agriculture, and with agriculture provincial demand for housing, continued booming until World War I thanks to high, albeit no longer strongly increasing cotton prices as indicated by provincial building worker wages. The ups and downs of the Egyptian, metropolitan Kuznets cycle with the migration of foreign building workers served to equalize wages for foreign building workers in Egypt and abroad and to bring wages for indigenous, skilled building workers more in line with those of foreign workers.

The cigarette industry is a rather different case. Owners, management and skilled workers appear mainly to have been Greeks, partly from Istanbul and Anatolia, moving to Egypt after the establishment of the Ottoman tobacco monopoly at the end of the 1870s, imposed by the European creditors after the Ottoman bankruptcy in 1875.[7] The introduction of Mixed Courts and the British occupation may have been decisive for the choice of Egypt as the new place of settlement of the private Ottoman-Greek cigarette industry. Technology was labor intensive until World War I although one

factory introduced some machinery as early as 1907. Our information about wages points to a high wage industry producing mainly high quality products for exports (the bulk going to Germany and United Kingdom).[8] After a ban in 1890 on tobacco cultivation in Egypt, the Egyptian cigarette industry depended entirely upon imports from the Ottoman Empire (Turkey), an obvious distortion imposed by the British for revenue purposes.[9] As pointed out by Owen (198), import, export and census data together suggest the existence also of a substantial cigarette production for the domestic market.[10] It stands to reason that this must have been low quality, low wage production (possibly based upon indigenous labor). Owen also indicates that it was this part of the industry that became mechanized in the 1920s while the high quality, export oriented part of the industry slowly disappeared under the impact of American competition. For a high quality, high wage export industry to exist side by side with a low quality, low wage, domestic market industry there must have been a significant skill difference, preventing easy mobility of labor from low to high quality production, unless, of course, the wage differential was based upon discrimination in favor of Greek labor. This, incidentally, is a consideration that may apply to the building and other industries.[11] Be that as it may, our wage data for the cigarette industry clearly refer to the high quality, high wage part of the industry that for its existence depended upon exports.[12] Without trade this dualism might not have existed. But without immigration it might not have existed either.

Let us then turn to trade as an equalizing mechanism. A celebrated theorem in the pure theory of trade claims that, granted a long list of

assumptions, trade serves to equalize factor prices for identical factors across countries (and regions). Our data seems to make a mockery of factor price equalization, at least in so far as land and unskilled labor are concerned. This should surprise nobody.[13] Land and unskilled labor in Egypt and the DCs may, as already pointed out, have been very different things; identical factors may have been paid equal price. A weaker version of the theorem, due to Ohlin, claims , more modestly, that trade only tends to equalize factor prices. Samuelson proclaimed that "Ohlin Was Right".[14] There are serious problems also with this weaker version of the theorem. It still refers to identical factors, and if not all assumptions for complete equalization are fulfilled everything depends upon exactly which one(s) does (do) not hold. With several factors, moreover, the notion of "equalization" of factor prices is no more well-defined than is the notion of equalization of income distribution (should we apply a Gini-coefficient or something similar?). Important from an empirical point-of-view is, finally, that a tendency towards factor price equalization must be defined and measured from a state of autarky towards a state of perfect equalization, and with the data available we have no way of determining what factor prices might be under such hypothetical states of affairs. For all these reasons, and others as well, it could be claimed that Ohlin's "tendency to factor price equalization" is but another red herring. If, on the other hand, our conjectures about equalization of rates of profits to physical capital hold water it is, considering the relative shortage of such capital in Egypt, difficult to see any other explanation of equalization of the rate of profit than the pattern of foreign trade -

despite all necessary qualifications to Ohlin's weaker theorem.

5. Final Remarks and Conclusions

Among the many problems in this comparison of factor prices in historical time and international space, quality and homogeneity of factors may be some of the most troublesome ones. They have been touched upon briefly just to point out that simple aggregation, measuring land by acres, labor by numbers of people or hours of work, and capital in constant money value, may not be adequate. If aggregation is necessary, and for all practical purposes it clearly is, exact or hedonic indexes may be the way out with theory and index-making properly coordinated. Egyptian historical data are entirely insufficient for that purpose, land rent possibly the exception. While direct observations of land rent and wages, however inadequate, are available, for the rate of profit on physical capital we have the additional problem that only indirect measures such as real returns to equity or at most direct measures for the modern, corporate sector are available. Whether in the national and historical context such measurement problems can be overcome is doubtful.

With all problems of measurement unresolved, it still seems clear that international movements of skilled labor and financial capital were responsible for the equalization of wages/returns for such labor and capital; it seems likely that differences in quality of land and unskilled labor are at least partly responsible for the huge differences in rent of land and wages of unskilled labor as compared with the DCs; and it is conceivable that trade may have served not only to equalize (tradable) commodity prices before taxation but also possibly played an important role in equalizing rates of profits to physical capital.

Table 1

Factor Prices Around 1900: Egypt, Italy, France, England, United States

	Rent of land agriculture $/acre/year (1)	Full time earnings of labor, $/year, males+ Agriculture laborers 1903 (2)	Building Industry: Nine skilled occupations simple av., 1903 (3)	Building Industry: Laborers, 1903 (4)	Cigarette industry (5)		Profits Corporate equity percent: Nominal yield (6)	Profits Corporate equity percent: Real return 1903-13 (7)
Egypt: Metropolitan	-	-	267[c]	97[g]	1910[l]		5.0	3.4
					Rollers, piece rate	597		
					Fillers	209		
					Controllers	179		
					Cutters, Packers	149		
					Packers (fem.)	105		
					Boys	60		
Other	18.62*	37-52[a]	223[d]	63[h]		n.a		
Italy: Big cities	-	-	210[dd]	132[hh]		n.a	n.a.	n.a.
Sicily	n.a.	104[aa]	n.a.	n.a.		n.a	n.a.	n.a.
France: Paris	-	-	474[e]	347[i]		n.a.	n.a.	n.a.
Other	3.40**	167[aaa]	261[e]	168[j]		n.a.	n.a.	n.a.
England: London	-	-	505[ee]	354[jj]		n.a.	n.a.	2.9[o]
Other	3.31***	180[b]	450[eee]	275[jjj]		n.a.	n.a.	n.a.
U.S.A.	0.75***	191-227[bb]	1,090[f]	464[k]	1897[m]		4.6	3.2
					Hand-makers	450-600		
					1903[n]			
					Cig. Mach. Feeders			
					male	224		
					female	300		
					Cig. Mach. Operators			
					male	426		
					female	450		

+ Unless otherwise stated. * 1897 ** 1895-04 *** 1900 o 1897-1913

Notes to Table 1

Sources: Col. 1 - Tables in Appendix I. Proctor Thomson, 1951, Table 30.

Col. 2 - [a] Hansen, March 1965; [aa] Hansen, Oct. 1982; [aaa] Proctor Thomson, 1951, Table 16, Col. 4; considering the source this may be common labor rather than agricultural labor. [b] British Labor Stat., Hist. Ab, 1868-1968 Table 8; [bb] Hist. Stat.; D739 and 789.

Col. 3 - Bricklayers (brick masons), carpenters, fitters, painters, plasterers, plumbers, stone masons, stone setters, structural iron workers. [c] Alexandria, indigenous, 300 days/year, Ann. Stat. de l'Egypte, 1914, Ch. XIX, Tabl. I; [d] Delta, ibid.; [dd] Hansen, Oct. 1982, Primo muratore, Milano, Firenze, Genoa, 300 days/year; [e] Ann. Stat. de la France, 1961, XXXIII A, Tableau I and II, 10 hours/day, 300 days/year; hours from Proctor Thomson (1951, Table 19). [ee] Brit. Lab. St., Hist. Ab., Table 8, Bricklayers, London, 50 weeks/year. [eee] ibid., Leeds; [f] Report of the Commissioner of Labor, 1904, Table I, pp. 48-54.

Col. 4 - [g] See c. [h] See d. [hh] See aa. [i] See e, Terrassier; [j] See e, maneuvre; [jj] Brit. Lab. Stat., Hist. Ab, Table 8; [jjj] ibid., Manchester; [k] See f, ibid., p. 50.

Col. 5 - [l] Vallet, 1911, pp. 99-100; [m] Killebrew & Myrick, 1897, p. 466, expert makers, 300 days/year. [n] See f, ibid., pp. 201-02.

Col. 6,7 - See notes to Table 4, A and B.

Exchange Rates: £E 1 = $4.98; F.fr.1 = $0.193; £1 = $4.85; LI1 = $0.192.

hal = acres 2.47 fedan1 = acres 1.04

Table 2

Egypt: Nominal and Real Factor Prices, 1903-1913

Year	Nominal factor prices: State domains, fermage, rental/feddan, £E (1)	Wages in building industry, adult males, PT/day, Sept. — Alexandria: Masons, brick: foreign (2)	Alexandria: Masons, brick: indigenous (3)	Alexandria: Laborers: foreign (4)	Alexandria: Laborers: indigenous (5)	Delta: Masons, brick: foreign (6)	Delta: Masons, brick: indigenous (7)	Delta: Laborers: foreign (8)	Delta: Laborers: indigenous (9)	Agriculture, output prices, 1903=100 (10)
1903	1.239	22.5	18.0	n.a.	6.5	21.8	13.6	n.a.	4.2	100.0
1913	1.982	20.0	18.0	n.a.	7.0	26.4	18.2	n.a.	5.5	140.0
Rate of change 1903-13, % p.a.	4.8	-1.2	0.0	n.a.	0.7	1.9	3.0	n.a.	2.7	3.4

Year	Factor prices in terms of agricultural output prices: state domains, fermage, rental/feddan, 1903-£E (1)/(10) (11)	Delta, laborers, indigenous, 1903-PT/day (9)/(10) (12)	Rate of profits, percent (13)
1903	1.239	4.2	n.a.
1913	1.416	3.9	n.a.
Rate of change, 1903-13 % p.a.	1.3	-0.7	n.a.

Sources: Col. 1 - Annuaire Statistique, 1914, Ch. XXI. Tableau I, line 8 divided by Tableau II, Col. 3.
Col. 2-9 - ibid., Ch. XIX, Tableau I.
Col. 10 - Wattleworth, 1978, Table A XLIII, p. A-127.

Table ?

Nominal and Real Differentials Between Alexandria and Italy, Masons

	1903	1908	1913
Alexandria, maçonnerie, briques, étrangers			
PT/day[a]	22.5	23.0	20.0
LI/day[b]	5.83	5.96	5.18
Cost-of-living, index[c]	100	133	135
Constant 1903-PT/day	22.5	17.3	14.8
Constant 1903-LI/day	5.83	4.48	3.84
Italy, primo muratore:			
LI/day[d]	3.62	4.12	4.97
Cost-of-living, index[e]	100	107	111
Constant 1903-LI/day	3.62	3.85	4.48
Ratio: Alexandria/Italy			
nominal wages	1.61	1.45	1.04
real wages	1.61	1.16	0.86

[a] Annuaire Statistique, 1914, p. 376.

[b] Conversion at par; see Table 2.

[c] Hansen, October 1982, pp. 57 ff.

[d] Applying relative increase in retribuzione media giornaliere, see l'Economia italiana, 1961, p. 570.

[e] Ibid., p. 570.

Table 4

A. Nominal Yields

(percents p.a.)

Period	Long Term Bonds			Corporate Equity	
	Govern-ment, Egypt*	Mun. High Grade, USA	Con-sols, UK	Egypt	USA
	(1)	(2)	(3)	(4)	(5)
1897-1913	3.0	3.5[a]	2.6		4.3
1897-1909	2.9	3.6[b]	2.4		4.1
1903-09	3.0	3.6	2.9	4.9	4.4
1910-13	3.2	4.0	3.2	5.3	5.0
1903-13	3.0	3.8	3.0	5.0	4.6
1927-36	(3.2)[c]	4.0	3.9	5.1	4.5
1927-38		3.9	3.8	5.0	

* Emprunt garantie, traded in London

[a] 1900-13 [b] 1900-09

[c] From 1932 conversion risk when market price exceeded par value.

Sources: Col. 1 - Annuaire Statistique de l'Egypte, 1914 and later.
Col. 2 - Historical Statistics, Part 2, X475.
Col. 3 - Mitchell & Deane, 1962, and Harley, 1976. 1897-1902 Goschen consols.
Col. 4 - My computations, see Table 4, B.
Col. 5 - Cowles, 1938.

Table 4 (cont.)

B. Real Rates of Return, One Year Holding

(percents, p.a.)

Period	Long Term Bonds			Corporate Equity				
						UK		
	Government, Egypt*	Mun. High Grade, USA**	Consols, UK	Egypt	USA	Foreign	Domest.	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1897-1913		0.9[a]	0.0		7.3			
1897-1909		1.4[b]	-0.7		10.1	9.5	0.9	3.0
1903-09	-2.9	1.4	0.3	4.1	6.5			
1910-13	0.4	0.8	0.1	2.2	-1.5	1.4	6.4	2.8
1903-13	-1.8	1.6	0.3	3.4	3.2			
1927-36	7.8[c]	6.3	7.9	7.0	10.1			
1927-38		6.1		4.1	6.9			
1903-13:								
Nom. yield	3.00	3.78	2.99	4.98	4.62			
Cap. gain	-1.41	-1.01	-1.81	1.94	-0.11			
Inflation	-3.43	-1.09	-0.92	-3.51	-1.34			
Net	-1.84	1.68	0.26	3.41	3.17			
1927-36:								
Nom. yield	3.24	4.02	3.86	5.11	4.50			
Cap. gain	2.89	1.23	3.41	0.23	2.34			
Inflation	1.69	1.88	0.62	1.69	1.52			
Net	7.82	7.13	7.89	7.03	8.36			

*Emprunt garantie
**Capital gains computed on stock market price for state-local government bonds
[a] 1900-1913 [b] 1900-09
[c] From 1932 conversion risk

Sources: Col.1 - Annuaire Statistique de l'Egypte, several issues.
Col.2 - Historical Statistics, X475, X493, E135.
Col.3 - Mitchel&Deane, 1962, p.455; Harley, 1976; Statistical Abstract of the United Kingdom, several issues.
Col.4 - Statistique des Societes Anonymes par Actions Travaillant Principalement en Egypte, Dec. 1911, 1928, 1931, 1934, 1937, Jul. 1938; Annuaire Statistique de l'Egypte, several issues; Papasian, 1926; The Egyptian Gazette, 1899-1913.
Col.5 - Cowles 1938; Ibbotson& Sinquefield, ibid.; Historical Statistics, E135.
Col.6-8 - Edelstein, 1982, Table 6.2.

Table 5

Real Rates of Return to Capital

United States, 1899-1969

Year	Real income per unit of of capital, Private dom., Economy, Kendrick, Index	After tax Own rates of return to prop. Chris.&Jorgen. percents p.a.		Common stocks, Real rates of of returns, One year hold., Ibbot.&Sinquef. percent p.a.			Rate of earnings, Cowles	
		Private nat.econ.	Corporate sector	comp.	arith. av.		adj.	adj.& defl.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1899	84.1					3.4	3.2	0
1919	86.1					-15.6	4.5	-10
1929	100.0	4.4	7.4		-8.6	-9.6	6.0	7.0
1937	82.8	3.1	6.3		-38.1		3.5	4.5
1948	124.8	4.5	7.0		2.9			
1957	95.2	3.0	4.0		-13.8			
1969		3.8	4.2		-5.0			
Period								
1929-37, av.	91.4	2.2	3.7	-2.0	-0.2		3.0	1.4
1937-48, av.	103,8	4.0	6.3	0.0	1.8			
1948-57, av.	110.0	3.6	4.9	14.4	15.7			
1957-69, av.		3.9	5.0	8.4	7.7			
1929-69, av.		3.5	5.0	6.5	8.8			
Tax rate 1958, %		35	44					
Before tax own rates		4.7	8.9					

Sources: Col.(1) - Kendrick (1961), Table 31.
,(3) Col.(2)/- Christensen & Jorgenson,(1973), Tables 8 and 10.
Col.(4),(5) - Ibbotson & Sinquefield,(1976), Tables 1,A-C and 5,A-C.
Col.(6) - Cowles, 1938; Historical Stat . E135.
Col.(7) - " E-1, adjusted for accumulated retained earnings.
Col.(8) - ibid., also minus rate of inflation.

Table 6

Corporate Business: Rate of Profits

Egypt and United States

(percent)

Year	Egypt, visible returns[e] to				United States, net income				
					IBRD-sample		All corporations		
	Share capital paid-up	Total own capital[a]	All capital[b] All compan.	All capital[b] Non-financial	Total own capital[c]	Real net assets[d]	Total own capital[c]	Real net assets[d]	Cowles adj.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1911	8.1	5.9	5.8	5.8					3.4
1913			5.7	6.0					3.6
1914					5.0	4.9			2.9
1928	10.2	7.6			7.5	8.9			4.1
1931									
1934	5.0	3.7			6.8	7.7	3.4	4.1	2.6*
1937									
1938			3.3	3.6	4.7	5.7	2.4	1.8	

a - Paid-up share capital plus reserves, not including depreciation charges.

b - Paid-up share capital plus reserves, not including depreciation charges, plus debentures.

c - Preferred and common stock, retained earnings, surplus, minus deficit.

d - Inventories, capital assets less reserves.

e - Dividends plus increase in reserves, not including depreciation charges. For All capital, also including interest payments on debentures.

* 1934-37

Sources: Col.s 1-4 - Statistique des societes anonymes, several issues.
Col.s 5-8 - Historical Statistics, 1975, Series V108-140 and 285-305.
Col. 9 - Cowles, 1938, my adjustments of E-1, see Table .

Table 7

Real Returns to Equity and Physical Capital

United Kingdom, 1870-1912(3)

(percent, p.a.)

Period	Activities		
	Domestic	Nondomestic	Total
	(1)	(2)	(3)
1870 - 1912(3):			
Equity	6.61	8.66	7.33
Physical capital	6.15	4.79	5.20
1870-76: Equity	11.94	7.34	8.72
1870-74 Physical capital	7.80	8.00	7.94
1877-86 Equity	7.19	13.27	11.45
1875-84 Physical capital	5.25	5.56	5.47
1887-96 Equity	8.93	5.34	6.42
1885-94 Physical capital	5.90	4.17	4.69
1897-09 Equity	0.92	9.54	6.95
1895-09 Physical capital	5.57	3.38	4.00

Sources: Equity - Edelman (1982), Tables 5.5 and 6.2.
Physical capital - Davis & Huttenback (1986), Table 3.15.

Table 8

Rates of Profits and Real Rates of Return, Corporate Business
United States and Egypt
1903 - 1938
(percent)

Periods	Corporate Business Accounts				Real rates of			
	United States			Egypt	Interest* United Kingdom		Returns to equity*	
	IBRD sample	Rate of earnings adjusted	Rate of earnings adjusted, deflated		Consols	Bank rate	United States	Egypt
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1910-13	4.89[a]	3.82	2.01	5.67[c]	-0.03	3.07	-1.49	2.27
1934-38	7.86[b]	2.55	0.24	3.33[d]	-2.75	-1.90	13.96	0.66
1903-13	n.a.	3.94	2.60	(5.9)	0.21	2.82	3.17	3.41
1927-38	7.27	2.98[e]	1.44[e]	(5.7)	7.82	4.26	6.90	4.14

[a] 1914 [b] 1934-39 [c] 1913(11) [d] 1938 [e] 1927-37 * One year holdings

Sources: Col.1 - Historical Statistics, V285-305, Net income over value of inventories + fixed assets (net).
" 2 - Cowles, 1938, E-1; adjusted for accumulation of retained earnings.
" 3 - Col.2 minus rate of inflation (COL); adjusted for accumulation of retained earnings.
" 4 - Tables II.1-3.
" 5 - Mitchell & Deane, 1962; Statistical Abstract of the United Kingdom, several issues.
" 6 - As Col.5 and Hawtrey, 1938, Appendix II.
" 7 - Tables II.7-9.
" 8 - Tables II.4-5.

Table 9

Factor Prices, Levels and Growth Rates
Egypt, France and U.S.A., ca.1900-ca.1939

		Agricultural rent $/acre/year (1)	Agricultural wages $/year (2)	Corporate Business: Equity, real return percent (3)	Corporate Business: Profit rate percent (4)
Egypt	1897	18.62	37 - 52[a]	3.4[b]	5.9[g]
	1937-39	30.85	45	4.1[e]	5.7[e]
France	1895-04	3.40	167	n.a.	n.a.
	1935-38	3.15	300	n.a.	n.a.
England	1900	2.13	180	2.9[f]	4.2[h]
	1937/39	2.12[c]	423	n.a.	n.a.
U.S.A.	1900	0.75	191 - 227	7.3[d]	3.9[b]
	1940	1.03	407	6.9[e]	3.0[e]
Growth rates, pct p.a.					
Egypt	in $	1.2	-0.4 - 0.6	0.7	-0.1
	in real £E	0.4	-0.4 - 0.6	0.7	-0.1
France	in $	-0.2	1.6	n.a.	n.a.
	in real F.fr.	-0.2	1.1		
England	in $	-0.0	2.3	n.a.	n.a.
	in real £	-1.2	1.3		
U.S.A.	$	0.8	1.3 - 2.1	-0.1	-1.0
	real $	-0.1	0.4 - 1.3		

Exchange rates - Before 1914: £E1=$4.98; F.fr.1=0.193; £1=$4.85
1937/39: £E1=$5.00; F.fr.1=0.0285; £1=$4.95
1935/38: F.fr.1=$0.0435

Hal = 2.47 acres, feddan1=1.04 acres. Sources: As in Table 1.

[a] 1903 [b] 1903-13 [c] 1938 [d] 1897-13 [e] 1927-38 [f] 1897-1913 [g] 1911-13

Table 10

Relative Factor Prices and Agricultural Factor Proportions

United States and Egypt

the 1900s and 1930s

	1900s		1930s	
	Egypt	United States	Egypt	United States
	(1)	(2)	(3)	(4)
Land/labor, acres/man	2.2	72	1.3	111
Capital/labor, 1900$s/man	70	776	113	2,201
Capital/land, 1900$/man	32	11	87	20
Rent/wage rate	0.5032–0.3581	0.0039–0.0033	0.6856	0.0025
Profit rate/wage rate	0.1595–0.1135	0.0204–0.0172	0.1267	0.0106
Profit rate/rent	0.3169	5.2000	0.1848	4.1748

Sources: Table 8 and Appendix III.

Footnotes:

[1]Cigarette tobacco sorters (very important for the quality of cigarettes) apparently earned even higher wages (Vallet, 1911, p. 99).

[2]"The cigarettes of this country [United States], both Turkish and Egyptian, are almost entirely made by machinery . . . at less expense, than the work can be done by hand.

The hand-made industry in this line, therefore, is reduced to small manufacturers, who cannot afford to lease or buy a machine; and to comparatively small trade in odd sizes, and in small separate orders of goods marked with a private crest, monogram or name. All factories making Turkish goods have a hand-made department to take care of special orders of this kind." (Werner, 1909, p. 42)

[3]Any more detailed discussion of the risk element would have to take into account the composition of companies by economic activity. Thus financial activities (mortgage loan institutions and commercial banks) play an important role in the Egyptian sample whereas such activities do not appear to be represented in the ~~in the~~ American data used for years before 1913. Also, concessionary, low-risk and monopolistic activities were more important in Egypt than in the United States. Data are available for providing such breakdowns for Egypt. A breakdown by financial and non-financial companies for the years 1927-38 shows virtually no difference in real returns. For 1927-38 non-financial companies show somewhat better returns than financial ones.

[3a]Tax rates for the corporate sector are given by C.& J. (1969, Table 5). For the interwar period corporate tax rates appear to have been of the order 15 percent rather than 44 percent for 1958. For the years 1929-69 the average rate appear to have been slightly below 40 percent so that for this period real return to corporate property before tax may have been slightly above 8 percent compared with 8.9 percent return to corporate equity.

— — 4 I have had some difficulties in sorting out the definitions of "profits", "returns", and such terms as used by Davis-Huttenback and I do wonder whether notes 30 to 32 in Chapter 3 do not suffer from errors of typing or print. I apologize for this very long footnote but it may be helpful to other readers of D.-H. Our concern is the obviously different definitions of rates of profits, returns, etc., used in Tables 3.2 to 3.13 with comments in Section IV, Rates of Return by industry; in Section V. Interindustry comparisons (no tables); and in Section VI. General measures of profitability with Table 3.15.

A rate of return or profit is a fraction and definitions of both numerator and denominator are required:

1. The most explicit and detailed definition is presented in note 31 and this is clearly the definition upon which the interindustry comparisons in Section V are based. The numerator here includes partners' share of profits and/dividends and types of retained profits, excluding interests on debenture, bonds and miscellaneous loans, regular depreciation and write-offs, to mention the most important items. The denominator here "is the value of contributed equity (i.e. unincorporated capital plus deposit capital plus ordinary shares plus preferred shares plus other shares plus premium shares, minus good will)." While possibly the numerator items are adjusted to modern accounting practices (p. 83, second paragraph), the denominator values appear to be book values. Original shareholders, founders and partners may find this concept of relevance.

2. The definition of the rate of return applied to Tables 3.2 to 3.13 seem to be the same with the crucial difference, however, that the denominator here is "the value of the firm's assets, converted if need be (particularly important for fixed assets) to current (replacement?) values and depreciated over a thirty year period. It is not clear to me what the analytical purpose is of this concept.

3. We have then the three "general measures of profitability" applied in Section VI with corresonding, computed "rates of return" presented in Table 3.15. These are:"(1) the rate of return to all capital claims, (2) the rate of return on the book value of equity, and (3) the rate of return on "adjusted assets" for firms in the goods producing sectors."

Of these three concepts, (1) seems to be explained in note 30, apparently inserted in a wrong section (p. 104, penultimate paragraph). Note 30 explains that "this first measure attempts to adjust for the difference in capital structure by including in returns all returns to capital (both debt and equity) instead of merely returns to equity. The numerator includes all interest payments in addition to the returns to equity. The numerator [should clearly be: denominator?] is the same measure of adjusted assets that has been used through most of this chapter". Since actually Sections IV and V operate with definitions (2. and 1., respectively) that differ in so far as the denominator is concerned, the last sentence quoted here is cryptic. I take it to mean that the "adjusted assets" referred to are assets at current prices as used in definition 2. above). - This is the concept used in the third group of three columns in Table 3.15: Rates of Return, All claims on capital.

The second measure, (2), is defined briefly in the first sentence of note 32 as "the rate of return ... on the book value of symbolic capital less the book value of good will or, in case of partnerships or sole proprietorships, the returns on invested capital less poughbacks and good will, if any (there seldom was)." I read this as simply being definition 1. above (given in note 31). - This is the definition used in the second group of three columns in Table 3.15: Rates of Return, Adjusted Equity.

Note 32 then explains that "The third measure [(3)] is similar to the / in measures reported/earlier sections of this chapter". Since, again, earlier sections operate with two different definitions we are left in mid-air. I assume from the words of the term that the reference is to Section IV and, hence, definition 2. above. The only special thing about it that it is confined to "the three goods-producing industries: commercial and industrial, brewing and distilling, and iron and steel. - This is the definition used in the first group of three columns in Table 3.15: Rates of Return, Adjusted Goods Producing.

I have in one place above omitted the world "high". This another source of confusion in the definitions used and the rates of returns computed by D.-H. The authors distinguish between "high" and "low" profitability activities, a distinction I do not find useful and shall not enter upon here.

[4a] Since there is much ambiguity in the data for the rates of profits, it should be emphasized that the figures in Table 9 for Egypt are averages for 1911 and 1913 and of 1928-31 with 1934-38 taken from Table 6, Col.2. The difficulty with Egypt is to obtain data for dividends, increase of reserves and stocks of capital pertaining to the same year. For 1911 and 1913 our data for reserves permit us to compute only an average increase for the period Dec.31, 1911 to Dec.31, 1913 while dividends refer to either calendar year 1911 or 1913. For these calm years the problem appears to be a minor one. For the years 1927 to 1938 with its violent business cycles this is definitely not the case. Reserves here changed violently, first up then down, and we are forced to operate with three-year averages of reserve changes with a serious break in the reserve series in 1934 when provisions are added to the reserves. This has nonetheless been done in Table 6, Col.2, avoiding forming an average for 1931-34. In Col.3 the problem exists only for 1911 and 1913 and looks minor and for 1938 it does not exist. But1938 is strictly the only year for which all data strictly pertain to the same period.

For the United States, the rate of profits figures in Table 9, Col.4 are based on the Cowles series for rate of earnings, adjusted as explained on p.93 in Appendix II. While the averages presented in Table 9 for 1903-13 and 1927-37 (singled out for the sake of comparison with Egypt) seem to indicate a clear decline in the U.S. rate of profits the slope of an estimated exponential trend for 1900-37 (-1.9 percent) is not statistically significant. Hence the conclusion of the text.

[5]T.W.Schultz (1964). Traditional agriculture in Egypt was much less capital intensive because basin irrigation required little dikes and no canals, dams or irrigation devices. For both traditional and modern agriculture we might add circulating capital, mainly crops on the fields and in store.

[6]See, for instance, Lewis (1978).

[7]Owen (1981, pp. 152 and 192-3) and (1984).

[8]Owen (1984).

[9]The ban on tobacco cultivation, harmful as it undoubtedly was to industrialization in Egypt, was of a very different nature, politically, than the countervailing excise tax levied on domestically produced cotton textiles from 1901, usually held out as the ultimate proof of British hostility to industrialization in the colonies.

[10]This is a tricky matter. There were many nationalities and groups in Egypt and everybody might discriminate against everybody else, each one according to his ability and prejudices. A British employer might discriminate in favor of British employees; faced with Greek and Egyptian indigenous labor he might make no difference, both being considered "Levantines". But a Greek employer might favor Greek employees as compared with indigenous Egyptians. There were, of course, many overlapping dimensions to the wage differential problem: language difficulties, cultural and work habits, etc., that may be difficult to separate from discrimination proper.

[11] Owen, op.cit.

[12]From note 2, page 2, it appears that our information about American wages for hand made cigarettes also may pertain to a special, high quality or even a luxury product.

[13] Samuelson (1949, pp.5-9)

[14]Samuelson (1971). What Samuelson shows in this paper is in effect something much more limited, viz. that "Ohlin's contention ... is essentially vindicated in [one particular, very special] technological model (ibid. p. 366 (668)), but this is not quite the same as proving that "Ohlin was right".

Appendix I

Estimates of Land Rent in Egypt, the United States and France

1. Egypt

Our estimate for Egypt, 1897, is from W. Willcocks, Egyptian Irrigation (2nd ed., 1899, pp. 17-19). This is the only existing systematic estimate of total land rent in Egypt before World War I. All other information is either anecdotal or strongly biased and thus of little value for our purpose.[1] Willcocks was a British irrigation engineer with experience from both the North-West Provinces of India and Egypt. In 1897 he was chairman of an official commission, appointed to assess rental value of all agricultural lands in Egypt as a preparation for the land tax reforms carried through during the first decade of the new century. Willcocks and his commission spent more than one year in the countryside, visiting and assessing every single hod (basin or field) in Valley and Delta. In his memoirs (Sixty Years in the East, 1935, pp.), Willcocks claims that the commission was dedicated to assess market rents fairly although it did tend to be lenient in particularly poor villages. Hence rental values for 1897 may perhaps have been assessed on the low side. This is what we would normally expect from assessments for tax purposes. Willcocks was something of a maverick, frequently in conflict with Cromer; an outstanding expert on land reclamation, irrigation and drainage, and agriculture with a strong sense of social justice and, apparently, an independent mind, he represented the best of British

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[1] Owen, 1974, no year; Richards, 1982, p. 119; Hansen, Oct. 1979, Chart.III.5.

Imperial administration and his self-evaluation should not be brushed aside. According to Willcocks' estimates we have (probably) for 1897:

	Upper Egypt	Lower Egypt	Egypt
Total value of crops, LE[1]	15,585,000	23,475,000	39,000,000
Cultivated area, acres[2]	2,320,000	3,430,000	5,750,000
Total rental value, LE[1]	8,300,000	13,700,000	22,000,000

[1] Willcocks actually uses an italicized l which presumably stands for lire which again probably means Egyptian pounds (1Ł=0.975 ŁE).
[2] Probably feddan (1 feddan = 1.04 acres).

For agricultural years (September to August) 1937-39 av., we have estimates from the Ministry of Social Affairs, reported by M. A. Anis (1950, p. 759):

Total output value, LE million	77,600
Total rental value, LE million	36,981
Total cultivable land, feddan 000	5,374

This estimate was probably based on market rentals as perceived and reported by agricultural district inspectors but nothing is known about the methods of computing total rental value.

Average nominal rent per feddan thus increased from LE 3.826 in 1897 to LE 6.882 in 1937-39 with an increase of 1.44 percent p.a. Agricultural output prices (Wattleworth, 1975, p. A-127) increased during the same period by 41.5 percent at a rate of 0.85 percent p.a. Real rent of land thus increased by 0.59 percent p.a. in terms of 1897 prices from LE 3.826 in 1897 to LE 4.863 in 1939-40.

In models operating with land as a factor of production, to be distinguished from labor and capital, the tacit assumption is mostly that it is a matter of Ricardian land: the original and indestructible powers of the soil. Land may be produced, however, and is never indestructable; agricultural specialists tend for that reason to think that "it is well nigh impossible to conceive of a real problem in which [the Ricardian] notion of a land would apply" (Schultz, 1953, pp. 139-41). To aggregate land with capital, as is always done in United States national accounting and modelling is not acceptable for countries like Egypt. As a minimum we should, for both the United States and Egypt separate buildings and improvements of land from land proper and estimate rental for land without buildings and improvements (clearing). Whether we should label the remaining residual as "land" is a semantic problem. In Egypt irrigation and drainage services are delivered from the public sector free of charge to cultivators. The consequence is that we should try to separate current costs of irrigation and drainage devices (buildings and clearing being unimportant in that country).

Using estimates of the stock of capital invested in irrigation and draining devices (Radwan, 1973, Table 2-1, nominal values), assuming a rate of interest of 5 percent for public loans, using an estimate of annual expenses on repair and maintenance of the hydraulic system for 1897 (Willcocks, ibid., 1899, p. 400), and budget data for public works 1935-39 (current expenditure in "services des irrigations" and "assainisement", Annuaire Statistique, 1937-38, p. 516) we have [1a]

[1a] Including the value of circulating capital in agriculture (crops on the fields or in store) and applying the rate of profit conjectured for physical capital (text Table 7) would make land rent higher and increasing faster and likewise for total profits.

	Nominal capital LE mill	Interests 5% p.a. LE000	Maintenance and Repair LE000	Current public expenditure LE000	Current public expenditure per acre LE
1897	10.4	520	655	1,175	0.231
1937-39	72.2	3,612	1,411	5,023	0.951

Deducting public expenditure per acre from the rent figures above, we obtain net land rent per feddan for 1897 as LE 3.595 and for 1935-39 as LE 5.931.

While our estimate from 1897 and 1937-39 are based on national surveys (the 1897 estimate being almost census-like), a second source of systematic information with accurate data as far as it goes, is unfortunately biased and difficult to use. The State Domains leased considerable areas against cash rent (fermage) and accounting data are available for both total revenue from and total area of cash lease (fermage) and rent per acre is easily computed. These are the rent data used in Table 3 for the years 1903-13, and a series can be established for the period 1879-1913. I am very reluctant in using this series. The level is completely out of line with the national averages. For 1897 the state domain average is ŁE 0.84 against ŁE 3.826 in Willcocks estimate. The main explanation appears to be (see Domaines de l'Etat Egyptien, Compte General, 1878-1898, p. 13) that large uncultivated areas were included in areas reported as being under fermage. For the years 1912-14 and 1927, Ahmed Abdel Wahab (1930) presented rent figures from certain State Domains with accounts. These were for 1913 about 3 times higher than the figures in Table 3. Abdel Wahab's data may exclude uncultivated lands.[2]

[2]In 1981-82, I made a search for the old State Domain accounts, back in (Footnote Continued)

This source of level bias may have changed over time and bias the rate of change. Second, the area under fermage declined dramatically over time from 202,981 feddan in 1883 to 143,473 in 1897 and further to 109,246 in 1903 after which year it remained approximately constant to 1913. The State Domains sold large areas of land during the years 1882 to 1903, and it was apparently the best lands (with the highest rent) that were sold out. Only from 1903 can we trust that the quality of land leased form the State Domains remained constant. Even so we have the problem of uncultivated land.

ii. The United States

In computing average rent of land per acre in U.S. agriculture, 1900-1940, we shall proceed in three steps which will supply us with three different estimates for the years 1910-14 to 1940, 1920 to 1940, and 1900 to 1920. These overlapping and partly independent estimates are then consolidated in a final estimate of land rent for the period 1900 to 1940 to permit comparison with the Egyptian data.

1. As the starting point we shall make use of the shares of agricultural land services as a percent of total inputs for the years 1910-14, 1920, 1924, 1931, 1933, 1946-48 and 1950, as reported by T.W. Schultz (1953, pp. 137,

(Footnote Continued)
time in the Ministry of Finance. I was informed by the General Organization of Land Reform, to which the State Domains had been transferred administratively after the Land Reforms, that the archives in 1939 had been moved from the (old) Ministry of Finance to a special archival building which was completely gutted by fire in the late forties. On that occasion the accounts of the State Domains perished. I was shown a few ledgers (for Sohag and Qalyoubia, 1920-21) which per chance had been in the Ministry at the time of the fire. I had hoped to obtain both wage and rental data in great detail from these accounts.

212-13, and 302). These shares were reportedly estimated by USDA, BAE.[3] No definition of total input value is given. For the years 1920, 1924, 1931, and 1933, the estimates are at constant 1946-48 prices. The only year for which information about the value of total inputs at current prices is available, is 1950 (ibid., p. 302). The total value of inputs was that year $25.21 billion. Total value of "realized gross farm income" (Hist. Stat., K 264) plus "net change in farm inventories" (Ibid., K 285), equal to total output value was for that year $33.083 bill. Total "expenses of agricultural production" (ibid., K 271) amounted to $19.410 bill. It is clear from the breakdowns in both sources that Schultz' total input includes imputed rental value of land

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[3] Methods of estimation are briefly described in BAE, Stat. Bul. 83, Oct. 1949, Table 27, note 1:

> "The BAE estimates the dollar value of net land rent paid on rented farm real estate each year. The rent estimates are net in that landlords' expenses on real estate, such as taxes, building depreciation, etc. are excluded from the rent estimates. The items deducted from gross rent are included in the estimates of total agricultural production expenses from taxes, depreciation, etc.
>
> Estimates of the cost of total net rent on all farm real estate each year were made by dividing the total net rent on rented real estate by the percentage that the value of rented real estate was of the total value of all real estate. From this was obtained the average 1935-39 net rent per acre of farm land; the rental per acre was multiplied by total acres of land in farms each year in deriving constant-dollar costs of land. "Land" here includes cropland, pasture land, other land, and buildings."

The method of finding net farm rent per acre is in principle the same as the one used in our second method with the main difference that the BAE apparently applies the method in the aggregate and only for the period 1935-39, wheras we start out from the county level and then aggregate to the total and that we proceed by first estimating rent/acre at current prices and then deflating by an appropriate output price index.

It should be added that the BAE-estimate of "net land rent paid on rented farm real estate each year," see above, do not appear to have been published. Even if they were made available we would still be up against the problem that gross rents are required (because the estimates of rental of dwellings are on a gross basis, and because data for value of land and buildings for cash rented farms are available only for 1930 and 1940).

and buildings and imputed wages for farmers with families. Applying Schultz' share of "land (net) rent" of 24.9 percent of 1950 to the total output value leads to an overestimate of rent by 31 percent. What the bias would be for other years we do not know. In any case, at this moment we shall for all years apply the shares reported by Schultz to total output value as defined above. We shall later return to the problem of the upwards bias involved.

[Table I.1]

Multiplying the shares with output value, total farm rent obtains (Table I.1, line 3.a). Deducting the USDC estimate of the rental value of farm dwellings we obtain an estimate of total land rent (in agriculture). Dividing through by total land in farms we obtain farm rent and land rent per acre (Table 1, lines 5.a and 5.b, resp.). To obtain land rent per acre in real terms we deflate, finally, by an output price index that does not comprise the price of farm dwelling services (Table I-1, line 7).

2. To control the estimates in Table I.1 we shall use information from the census of Agriculture from 1920, 1930 and 1940 with some additional information from 1920 contained in a special USDA-study (Dep.Bul. No. 1224) from 1924. From 1920 the agricultural censuses collected information about cash rent paid or payable from cash tenants. The cash rents reported are contractual rents for land and buildings and as such should represent market rentals (for a detailed conceptual discussion see, however, Cash Rent, USDA and USDC, 1944, Introduction, pp. 1-6, and Appendix, pp. 132-35). Obviously, data on contractual cash rents are available only from farms actually leased (and reporting). Moreover, we shall use data only from whole farm units leased; cash rents paid by part owners are difficult to use for our purpose and not considered here. We are aiming at average farm and, ultimately, land rent for all lands in farms, whether leased at cash rent or not. Our first

Table I.1

Farm and Land Rent, U.S., 1910-14 to 1940, Estimated, Method 1

	1910-14	1920	1924	1930	1931	1933	1940	1945-48
1. Share of farm rent in total input, pct.	23.6	20.7	20.98	(21.75)	21.86	23.78	(24.6)	25.4
2. Total realized gross farm income plus inventory change, $ mill	8,320	16,632	12,302	11,203	8,881	6,913	11,340	30,946
3. a. Total farm rent, $ mill	1,964	3,443	2,581	(2,457)	1,941	1,644	(2,790)	8,238
- b. Gross rental value of farm dwelling	491	835	854	865	775	614	744	1,327
= c. total land rent, $ mill	1,473	2,608	1,727	(1,572)	1,166	1,030	(2,046)	6,911
4. Land in farms, acres 000	894,737	958,677	931,191	990,112	1,002,990	1,028,760	1,065,114	1,150,000
5. a. Farm rent per acre, $	2.20	3.59	2.77	(2.4613)	1.94	1.60	(2.62)	7.16
b. Land rent per acre, $	1.65	2.72	1.85	(1.5877)	1.16	1.00	(1.92)	6.01
6. Output price index, 1910-14=100	100	211.4	140.3	125.3	86.4	69.2	99.4	253.9
7. Real land rent per acre, 1910-14 $s	1.65	1.29	1.32	(1.27)	1.34	1.45	(1.93)	2.37
8. Rate of change, real land rent/acre, since 1910-14, percent p.a.	-	-3.0	-1.8	(-1.4)	-1.1	-0.6	(0.6)	1.06

Sources

1. Schultz, 1953, pp. 137,213. Total input appears to include farmers' and family labor and rental value of farm dwellings. Total input thus defined almost equal to output. 1930 and 1940 interpolated.
2. Historical Statistics, K. 264 plus K. 285.
3. Line 2 times line 1, divided by 100, minus Historical Statistics, K. 270.
4. Historical Statistics, K. 5.
6. Chained. 1910-14 to 1929: BLS Wholesale Prices, Farm Products, Historical Statistics, E42. 1929-48: Implicit deflator, cash receipts from farm marketing, etc., National Income and Product Accounts, USDC, BEA, 1929-76, Stat. Tables, Sept. 1981, Table 7.10, Line 2.
7. Line 5 deflated by line 6.
8. From line 7.

problem is how to apply observed cash rents for actually leased farm units to all farms.

If all lands and farm buildings were of identical "quality" (including fertility and location), we could simply assume that rent per acre for non-leased farms equals observed (cash) rent for actually leased farms.[4] This assumption cannot possibly be made for the United States with its enormous spatial, soil, and climatic variations. Following suggestions by the USDA (Dep. Bul. No. 1224, p. 6, and Stat. Bul., op. cit.), I shall assume that within a given locality the cash rent -- farm value ratio is the same for cash leased and all other farms. By farm value we here mean value of land and buildings. The values reported in the censuses are based on farmers' subjective assessments. Strictly speaking these are not market values although they do tend on average to coincide with actual market values (Dep. Bul. No. 1224, pp. 10-13) for large numbers of farms. With static expectations, the observed cash rent -- farm value ratio is nothing but the (gross) rate of return to investment in farms (land plus buildings). With competitive lease and farm markets, net returns to investments in farms should tend to be the same for all farms in a given locality. For a given locality, total cash rent divided by total farm value for cash leased farms yields the average gross return to investment in farms in this locality. Applying the average return, thus calculated, to the total value of farms in the locality we obtain the total gross rent for the locality. Dividing finally, by total

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[4] This is the method used by Gale Johnson (1948, Appendix, Table 1). See also Procter Thomson (1951, Table 3). It is definitely inferior to the USDA-method applied in this appendix, and I shall not consider Gale Johnson's results. For 1900, however, Thomson's extrapolations to 1900 imply rent per acre at current prices equal to $0.94/acre which is quite close to my final estimate, $0.75/acre, see Table I.4 below.

acres of land in farms, the average gross farm rent per acre for the locality obtains.

There are quite a few snags in this method. One is the difference between net and gross rent. It should be emphasized, however, that we are interested in land rent as a factor price, that is before tax; property tax happens to be the major part of the difference between gross and net rent (Dep. Bul. No. 1224, Table 8, p. 27). Also, for our limited applications the assumption of static expectations is unnecessary. If, for instance, the farm values for cash tenant farms are high because future rents are expected to increase, the current cash rent - land value ratio will be low. If, however, expectations about future income from non-leased farms are equally bullish, application of the low cash rent - farm value ratio to all farms will correctly lead to current income (rent) for all farms. Our basic assumption is thus that within a given locality expectations about the future are identical for all potential farm investors. This may be an innocuous assumption if the locality is sufficiently small.

Published information from the censuses of 1930 and 1940 permits this method to be applied at county, district, and state levels as well as for the U.S. as a whole. Our assumption of equal return to all farm investment is obviously more realistic the smaller the locality is. Computational work, on the other hand, increases rapidly with the smallness of the locality. The number of counties in the U.S. are legion; there were only 48 states. Limited computational resources prompted me as a first approximation to compute on a state basis. The results for 1940 are shown in Table II-2, Col.s 1-4. Average nominal farm rent per acre for 1940 was found to be $1.72. With the first method (Table 1), the corresponding figure was $1.92 without buildings

Table I.2

State	Aggregates 1940 - Census Data: Cash rent-farm value ratio, pct. (1)	Farm value total, $ mill. (2)	Land in farms, acres 000 (3)	Rent per acre, $ 1x2/3 (4)	County Sample 1940: Cash rent-farm value ratio, est. pct. (5)	Farm value, $ mill. (census) (6)	Land in farms, acres 000 (7)	Rent per acre, $ 5x6/7 (8)	County Sample 1920: Cash rent-farms value ratio, est. pct. (9)	Farm value, $ mill. (census) (10)	Land in farms, acres 000 (census) (11)	Rent per acre, $, est. 9x10/11 (12)
New England												
Maine	6.29	124	4,223	1.85	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
N. Hampshire	5.11	62	1,809	1.75	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Vermont	5.26	111	3,667	1.59	5.37	51	1,768	1.56	4.92	73	2,015	1.78
Mass.	5.26	212	1,938	5.75	4.76	117	1,402	3.97	4.29	149	1,881	3.40
Rh. Island	3.85	26	222	4.51	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Connecticut	3.89	205	1,512	5.27	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Middle Atl:												
New York	4.61	947	17,170	2.54	5.21	221	4,749	2.42	5.15	324	5,749	2.90
New Jersey	5.40	228	1,874	6.57	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Penn.	4.48	864	14,594	2.65	4.39	144	2,258	2.80	4.10	183	2,785	2.70
E.N.Central												
Ohio	5.04	1,444	21,908	3.32	5.21	612	8,390	3.80	3.67	1,134	9,079	4.58
Indiana	5.44	1,251	19,801	3.44	5.66	341	4,345	4.44	3.93	733	4,545	6.33
Illinois	5.04	2,537	31,033	4.12	5.05	1,325	15,157	4.41	2.85	3,189	15,306	5.93
Michigan	4.75	913	18,038	2.40	4.96	230	3,736	3.05	4.25	367	4,129	3.78
Wisconsin	5.66	1,189	22,876	2.94	5.85	272	3,782	4.20	3.67	525	3,806	5.06
W.N.Central												
Minnesota	5.98	1,443	32,607	2.65	6.14	939	18,623	3.09	2.85	2,189	17,753	3.51
Iowa	6.28	2,691	34,149	4.95	6.31	1,315	15,687	5.29	2.93	3,751	15,570	7.05
Missouri	5.51	1,107	34,740	1.76	5.64	277	8,730	1.79	3.36	941	8,699	3.63
N. Dakota	4.80	490	73,936	0.62	5.25	108	4,303	1.32	3.60	292	4,079	2.58
S. Dakota	5.15	505	39,474	0.66	6.36	151	3,118	3.08	2.47	637	3,019	5.21
Nebraska	5.57	1,138	47,344	1.34	5.55	404	8,261	2.71	2.52	1,392	7,953	4.41
Kansas	5.08	1,421	48,174	1.50	4.94	370	9,347	1.96	3.32	799	8,940	2.96

South Atl.												
Delaware	5.41	53	896	3.32	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Maryland	4.40	274	4,198	2.87	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
D. of Col.	1.55	6	2	46.50	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Virginia	4.20	675	16,445	1.72	6.92	30	1,030	2.00	4.66	52	1,068	2.27
W. Virginia	4.34	270	8,909	1.32	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
N. Carolina	5.44	737	18,845	2.13	6.21	78	1,870	2.60	5.84	127	1,892	3.93
S. Carolina	6.16	338	11,239	1.85	5.29	23	876	1.38	7.24	61	902	4.93
Georgia	6.52	480	23,684	1.32	5.84	114	5,150	1.29	7.30	249	5,167	3.51
Florida	6.48	324	8,338	2.52	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
E.S. Central												
Kentucky	4.96	776	20,294	1.90	4.83	193	2,397	3.88	4.55	332	2,373	6.37
Tennessee	6.09	664	18,493	2.19	7.64	63	1,675	2.87	6.21	114	1,599	4.42
Alabama	7.11	409	19,143	1.52	7.69	130	5,898	1.70	9.35	169	6,041	2.65
Mississippi	9.07	475	19,156	2.25	10.28	200	5,080	4.06	10.03	399	4,332	9.25
W.S. Central												
Arkansas	8.49	457	18,045	2.15	8.44	183	4,177	3.70	10.96	254	3,160	8.79
Louisiana	5.78	354	9,996	2.05	5.51	94	2,259	2.30	6.94	135	2,296	4.09
Oklahoma	5.29	831	34,803	1.25	4.81	365	12,436	1.41	4.76	541	11,246	2.29
Texas	4.33	2,590	137,683	0.81	4.75	444	14,341	1.47	5.79	722	12,975	3.22
Mountains												
Montana	5.14	350	46,452	0.39	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Idaho	6.78	339	10,298	2.23	6.81	196	3,986	3.34	6.43	349	3,394	6.62
Wyoming	5.10	159	28,026	0.29	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Colorado	5.71	388	31,527	0.70	5.98	183	10,870	1.01	5.32	381	9,238	2.19
New Mexico	4.04	188	38,860	0.20	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Arizona	8.72	154	25,651	0.52	9.58	67	1,122	5.70	8.37	92	802	9.57
Utah	6.26	154	7,302	1.32	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nevada	5.50	48	3,785	0.70	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Pacific:												
Washington	5.32	593	15,182	2.08	5.34	122	1,400	4.66	3.72	160	1,320	4.50
Oregon	5.10	477	17,988	1.35	4.68	238	4,355	2.56	3.41	306	3,842	2.72
California	5.98	2,166	30,524	4.24	6.08	986	8,688	6.90	4.21	1,446	9,094	6.69

Totals:												
All states,												
U.S.	5.4422	33,758	1,065,114	1.7249	5.4422	33,758	1,065,114	1.7249	n.a.	66,446	958,677	n.a.
All sample												
counties					5.8251	10,486	201,266	3.0348	3.8317	22,566	196,047	4.4105
Sample counties,												
% of U.S.					-	31.06	18.90	-	-	33.96	20.45	-
Value/acre:U.S.		31.6943				31.6943				69.3101		
" :Sample		52.0986				52.0986				118.1056		
" :Sample/US						1.64				1.66		
rent/acre,adj.								1.7249				2.5068

Sources (to Table 2)
Col. 1 - Cash Rent, USDA & USDC, 1944.
Col.s 2,3 - Historical Statistics, K17.
Col. 5 - Census, 1940, County averages, weighted state averages, my estimates.
Col. 6,7 - Census, 1940.
Col. 9 - U.S.D.A., Dep. Bul. No. 1224, Table 1, weighted state averages, my estimates.
Col.s 10,11 - Census, 1920.

Table 1.2a

Census 1930

State	Cash rent farms: Cash rent paid/liabl. $ (1)	Cash rent farms: Farm value $ (2)	Cash rent farms: Cash rent/farm value ratio pct. (3)	National Aggregates: Farm value $ million (4)	National Aggregates: Farm rent $ million (5)	National Aggregates: Land in farms acres, 000 (6)	National Aggregates: Farm rent $ per acre (7)
New England							
Maine	279,952	5,267,590	5.31	194.27	10.32	4,640	2.23
N. Hampshire	124,396	2,563,690	4.85	77.36	3.75	1,960	1.92
Vermont	266,353	5,118,825	5.20	145.94	7.59	3,896	1.95
Massachusetts	372,217	8,459,823	4.40	261.22	11.49	2,005	5.79
Rh. Island	123,394	3,397,385	3.63	34.51	1.25	279	4.49
Connecticut	316,597	9,374,809	3.38	227.41	7.68	1,502	5.11
Middle Atl.							
New York	3,203,469	84,543,492	3.79	1,315.90	49.86	17,980	2.77
New Jersey	1,003,264	25,804,466	3.89	298.85	11.62	1,758	6.61
Pennsylvania	2,740,889	84,380,298	3.25	1,203.02	39.08	15,309	2.55
East N. Central							
Ohio	5,447,763	109,646,510	4.97	1,693.03	84.12	21,514	3.91
Indiana	2,599,530	49,717,395	5.23	1,415.54	74.01	19,689	3.76
Illinois	13,033,497	303,148,394	4.30	3,336.05	143.43	30,695	4.67
Michigan	2,287,491	71,991,783	3.18	1,160.65	36.88	17,119	2.15
Wisconsin	6,831,013	134,026,486	5.10	1,731.52	88.25	21,874	4.03
West North Central							
Minnesota	13,631,846	269,684,352	5.05	2,125.09	107.42	30,913	3.47
Iowa	47,285,938	850,570,527	5.56	4,224.51	234.85	34,019	6.90
Missouri	5,912,204	125,494,710	4.71	1,796.25	84.62	33,743	2.51
N. Dakota	729,545	14,849,843	4.91	951.23	46.73	38,658	1.21
S. Dakota	3,794,788	78,795,173	4.82	1,285.15	61.89	36,470	1.70
Nebraska	9,494,378	212,207,949	4.47	2,495.20	111.64	44,709	2.50
Kansas	4,871,584	106,252,610	4.58	2,281.10	104.59	46,976	2.23

South Atlantic							
Delaware	136,379	3,786,240	3.60	66.94	2.41	901	2.68
Maryland	499,238	16,261,070	3.07	356.17	10.93	4,374	2.50
D. of Columbia	7,060	581,000	1.22	7.14	.08	3	28.92
Virginia	1,086,883	31,050,400	3.50	855.85	29.96	16,729	1.79
W. Virginia	680,164	21,125,167	3.22	341.98	11.01	8,802	1.25
North Carolina	1,471,838	26,582,286	5.54	844.12	46.74	18,055	2.59
South Carolina	1,902,772	27,555,322	6.91	379.19	26.18	10,393	2.52
Georgia	3,554,936	57,357,477	6.20	577.34	35.78	22,079	1.62
Florida	940,730	16,511,268	5.70	423.35	24.12	5,027	4.79
East South Central							
Kentucky	1,506,192	33,106,518	4.55	871.45	39.65	19,927	1.99
Tennessee	2,365,911	38,432,297	6.16	743.22	45.75	18,003	2.54
Alabama	5,302,345	68,779,122	7.71	502.37	38.73	17,555	2.21
Mississippi	5,125,573	49,423,044	10.37	568.32	58.94	17,332	3.40
West South Central							
Arkansas	2,768,015	34,029,204	8.13	547.83	44.56	16,053	2.78
Louisiana	1,790,616	27,447,992	6.52	418.19	27.28	9,355	2.92
Oklahoma	4,026,140	85,240,086	4.72	1,242.72	58.70	33,791	1.74
Texas	6,754,197	179,311,020	3.77	3,597.41	135.50	124,707	1.09
Mountain							
Montana	1,184,002	23,386,300	5.06	527.61	26.71	44,659	0.60
Idaho	1,585,037	22,584,397	7.02	417.25	29.28	9,347	3.13
Wyoming	458,646	10,310,950	4.45	206.85	9.20	23,525	0.39
Colorado	1,639,361	32,655,800	5.02	629.35	31.59	28,876	1.09
N. Mexico	453,605	10,985,918	4.13	207.86	8.58	30,822	0.28
Arizona	1,264,967	16,387,052	7.72	184.23	14.22	10,527	1.35
Utah	578,345	9,805,678	5.90	221.22	13.08	5,613	2.32
Nevada	237,486	4,161,983	5.71	64.11	3.66	4,081	0.90
Pacific							
Washington	2,569,857	49,531,859	5.19	773.66	40.14	13,534	2.97
Oregon	2,100,950	47,830,624	4.39	630.83	27.71	16,549	1.67
California	15,361,479	301,615,346	5.09	3,419.47	174.15	30,443	5.72
Totals							
U.S.	191,700,832		4.87*	47,994	2,335.71	990,112	2.3590

* Col. 5/ Col. 4

and $2.62 with buildings included. The results for 1930 are shown in Table I.2a.

[Tables I.2 and I.2a]

For 1920, the first census to collect information about cash rent for leased farms, we are up against serious difficulties. The information about cash rents was not tabulated and the census volumes contain no data about cash rent. The USDA in 1924, however, published a special study of cash rents and land values in 1920 for a sample of counties, based upon the questionnaires of the 1920 census. The aim of this study was to explain certain differences in the cash rent - land value ratio by regions and not to come up with an average of cash rent for the U.S. as a whole, or for individual states for that matter. The difficulties in using this information for the latter purpose arise, first, from the fact that it is a matter of an "old-fashioned" sample of so-called representative counties from districts which were thought homogenous in various regards.[5] Second, the information for each county is limited to a) number of cash tenant farms in sample, b) average cash rent per acre, c) average land value per acre, and (implied by b) and c)) the average

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[5]"This study is based on 154,653 cash rented farms in 567 counties. In selecting the counties no attention was paid to State lines. The effort was made to choose groups of counties which are representative of the principal agricultural regions. It was impossible to carry out this purpose as completely as desirable, because in many areas the number of cash-rented farms is too small to give reliable averages.[2] [[2]The number of cash tenants by counties reported in this bulletin will not agree with the number of cash tenants as reported in the census, because all farms of 10 acres and less were excluded from this study.] . . . The 567 counties were then grouped into districts. The purpose . . . was to show the averages for typical regions and to give the basis for making further analytical studies of the data . . . effort was made to secure a rough uniformity in the economic and the general physical conditions in each district. No attempts were made to divide the entire country into homogeneous districts, but only to group the counties in this study so that they would present a rough uniformity" (USDA, Dep. Bul. No. 1224, 1924, p. 3-4).

cash rent - land value ratio, all for white (including Mexicans) and non-white cash tenants, separately. The cash rent - farm value ratio for all cash tenant farms, white and non-white aggregated, is not available and had to be estimated somehow. The published 1920 census data do not include the natural weights, i.e. total farm value held by white and non-white tenants aggregated is not available.

The first problem was the to compute weighted averages of cash rent - land value ratios by county for states with non-white cash tenants. 33 states are covered by the sample; of these 17 reported non-white cash tenants, all in the Southern, Mountain and Pacific regions. The only option open was to weight by the number of farms (this datum is available). This method has the drawback that since white cash tenants on balance held larger and more valuable farms than non-white cash tenants and, on balance, non-white tenants paid higher cash rents relative to farm values, weighting by number of farms gives rise to an upwards bias in the average cash rent - farm value ratio by county.[6]

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[6]USDA (Dep. Bul. No. 1224, p. 6) suggests for that reason that cash rent for white (one-year, non-relative) tenants be used for estimating the farm rent for all lands, the argument being that cash rents for non-white cash tenants is upward biased due to risk factors and/or discrimination (ibid., p. 55-9). Discrimination is, of course, a deviation from the competitive model underlying our methodology, but it is not obvious that actual cash rent for white tenants represents the competitive rent when discrimination against non-white tenants is present. One argument would be that with discrimination and, hence, relatively high cash rents for non-white tenants, the supply of farms available for white tenants will be larger, and cash rents for white tenants lower than would be the case without discrimination against non-whites. If, however, to continue the argument, non-whites were discriminated against also in other occupations, everything would depend upon the relative degrees of discrimination in land lease and other markets, in particular those of share cropping and rural labor. Other, non-competitive models, such as Reich's divide-and-govern model might perhaps apply (Reich, 1981). We shall not go further into this important matter here.

Having thus obtained average cash rent - farm value ratios by county, averages had to be formed for the sample as a whole. Letting r denote cash rent per acre, a cash rent - land value ratio, A number of acres of land in farms, V value of land (and buildings), R total rent, i as subscript county and bar weighted mean, we have

total rent in county i	$a_i V_i = R_i$
rent per acre in county i	$a_i V_i / A_i = \bar{r}_i$

and

total rent in sample	$\sum_i a_i V_i = R$
rent per acre in sample	$\sum_i a_i V_i / \sum A_i = \bar{r}$
rent - farm value ratio in sample	$\sum_i a_i V_i / \sum V_i = \bar{a}$

For 1920, a_i is based on observed and/or estimated cash rent - farm value ratios in the sample counties as explained above. For 1940, a_i was obtained from census publications (Cash Rent, USDA and USDC, 1944). V_i and A_i were obtained from the census publication for 1920 and 1940. The computations were made both by state and for the sample as a whole. Only 31 states were covered by the sample and for some states only a few counties were included. The whole sample is not a probability sample for the U.S. and the counties in the sample for a particular state are not a probability sample for that state either. Yet, I thought it might be of some interest to see the results on a state basis. The results are shown in Table I.2, Col.s 5-12.

From the totals at the bottom of Table I.2 we get some idea about the "representativeness" of the county sample from our (the national) point of view. The shares of land in farms and farm value were almost the same in 1920 and 1940, about one-fifth for land in farms and one third for farm value. The

difference between the shares implies, however, that the sample is biased towards high value farms, the ratio between value per acre in the sample and in the U.S. being 1.66 in 1920 and 1.64 in 1940. The bias is strong but apparently constant. Since value of farms may be viewed as cash rent over cash rent - farm value ratio, we find that the bias is mainly the consequence of a bias in the sample towards high rent farms. The estimated rent - farm value ratio in the sample was in 1940 (1920 not available) about 7 percent higher than for the U.S. while the estimated rent per acre in the sample in 1940 was 76 percent higher than for the U.S. While thus average rent in the sample clearly is a strongly biased estimate of the U.S. average, we may still hope that the change from 1920 to 1940 may be unbiased. We shall return to this problem in section 4.

3. We are, finally, confronted with the problem of the development of rent from 1900 to 1910-14 and 1920. The censuses offer no help here but we do have data on rent in seven states from 1900 to 1920 (Dep. Bul. No. 1224, pp. 19-21). These data are in the form of weighted averages of nominal rents in an increasing number of farms in 1900, 1905, 1910, 1914, 1916, and 1920 in Table I.3. As weights we have used the number of farms in the samples. The data are based on questionnaires sent by the USDA for the Dep. Bul. No. 1224, i.e. between 1920 and 1924, to leasing landlords. The response was poor as one could expect for questionnaires asking questions about rents 20 years ago. The reliability cannot be high. Rents are obviously here farm rents.

[Table I.3]

4. Our results are summarized and chained together in Table I.4. Including rental value of dwellings, rates of change of farm rent are very similar for overlapping periods with the exceptions of 1930-40. For two estimates (Col.s 2 and 3) the ratio between farm rent per acre for 1920 and

Table I.3

	Numbers of Farms	Cash rent per acre weighted average	States
1900	108	3.2730	Iowa, Ohio, Wisconsin
1905		3.5086	
1905	230	3.5091	Iowa,Ohio,S.Wisc.,S.Min., N. Illinois
1910		4.0112	
1910	500	3.9981	Iowa,Ohio,S.Wisc.,S.Min., E.Nebr.,S.Dakota,N.Ill.
1914		4.5388	
1914	1,012	4.5709	same
1916		4.9648	
1916	1,239	4.9585	same
1920		6.6867	

Source: USDA, Dep. Bul. No. 1224, pp. 19-21.

1940 are close to 0.7. For two estimates (cols. 3 and 4) this ratio is close to 1.6. For 1930-40 the census estimates show a decline by 27 percent, the share method an increase by 6 percent. We have to make a choice. The weakness of the share approach is that with the exception of 1910-14 it operates with input shares at constant prices (for some years interpolated) applied to total output. The shares were, on the other hand, obtained by the same basic method I adopted in computing the census averages, i.e. by assuming that the rent-value ratio for cash leased farms apply to all farms within a locality. In addition, the census averages were computed on a state basis whereas the constant price shares were computed directly at the national level. It follows that we should prefer the census estimates for farm rent for 1940 and 1930. For 1920 and 1940 we have census estimates based on a biased county sample as earlier described. I prefer the 1920 census county sample to the share method. The choice here, fortunately, is an easy one because the change from 1920 to 1940 is almost the same for the county sample and the share approach; hence, the chained figure for 1920 in Col. 2. Deducting gross rental value of farm dwellings per acre (Col. 5), we obtain nominal gross land rent per acre in Col.s 6 and 7, by census and share approach, respectively. In the final chained series for nominal gross land rent I preferred the census figures for 1940, 1930, and 1920. For the period 1910-14 to 1920, I prefer to use the figures from the share approach (Col. 7) rather than the alternative, the seven state sample. Without deduction for rental value of dwellings, share approach (Col. 3) and seven state sample (Col. 4) show almost the same rates of increase. With deduction for rental value of dwelling, the share approach show a considerably smaller rate of increase but this is obviously the estimate we should use, granted that our interest is in land rather than farm rent. For 1900 to 1910-14, the seven

state sample is our only source of information. Hence the chain in Col. 8. The real gross rent of land follows by deflation by an agricultural output price index.

[Table I.4]

For the comparison with Egypt our main interest is the level of real land rent/acre in 1900 and 1940 and the rate of change between these years. The level is almost unchanged with a slight decline of -0.07 percent p.a. This result, as should be understood, is determined with a considerable margin of error and systematic error cannot be excluded, in particular for the years 1900-20.

Let it, finally, be emphasized that our estimate of gross land rent does include interest and depreciation on improvements and farm buildings. Tostlebe (1957, Appendix A) estimates for 1910-14 the ratio of per acre value of "improved" and "unimproved" farmland to be about 3 to 1 in all humid states except those of the Great Plains region, Iowa and Illinois where a lower ratio of 1½ to 1 would prevail. Estimates for later years do not appear to be available.[7] One would perhaps expect this ratio to have increased over time, improved land being increasingly improved. That being the case we should expect real land rent proper to be even lower in both 1910-14 and 1940 and may have increased less (even decreased) over this period; land deterioration and erosion has been widespread and land improvement may have been negative during the inter-war period.

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[7] Towne & Rasmussen (1960, p. 270) supplies scattered information for the nineteenth century.

Table I.4

Summary of Estimates

Year	Nominal gross farm rent, $/acre: Census (1)	Census, county sample (2)	Share approach (3)	Seven state sample (4)	Gross rental value of farm dwelling, $/acre (5)	Nominal gross land rents, $/acre: Census (1)-(5) (6)	Share approach (3)-(5) (7)	Chain (8)	Farm output price index, 1900=100 (9)	Real gross land rent, const. 1900 $ per acre (10)
1940	1.7249	3.0348	2.6194		0.6985	1.0264	1.9209	1.0264	140.3	0.7316
1930	2.3590		2.4613		0.8736	1.4854	1.5877	1.4854	174.8	0.8498
1920	(2.5068)	4.4105	3.5914	6.6867	0.8710	1.6358	2.2704	1.6358	298.4	0.5482
1910-14			2.1951	4.2999	0.5488		1.6463	0.9834	141.2	0.6965
1900				3.2874				0.7519	100	0.7519
Ratios:										
1940/1930	0.73		1.06							
1940/1920		0.69	0.73							
1920/1910-14			1.64	1.56		1.40				

Sources: Col. 1 - Table I.2, Col. 4, Table 2a, Col. 7, totals. 1920 chained from Col. 2.
Col. 2 - Table I.2, Col.s 8 and 12, totals.
Col 3 - Table I.1, line 3a, divided by line 4.
Col. 4 - Table I.3
Col. 5 - Hist. Stat., Series K270 divided by K17.
Col. 9 - Table I.1, line 6.

iii. France

The estimates of rental of land in nominal and real terms are shown in Table 5. The starting point is the information about the total amount of rent in agriculture, Col. 4. The information is from Procter Thomson (1951, Table 14). Several estimates of agricultural income are available. I have used those of Toutain from the I. S. E. A. They are somewhat lower than, but also later than, those of Perroux (also, I.S.E.A., Ann. Stat. de la France, p. 359, Tabl. XIV.) and I assume that recent estimates are preferable. Land data (Col. 5) are from the same source and so is the implicit deflator (Col. 3). Nominal and real rent obtain in Col.s 6 and 7.

[Table I.5]

iv. England and Wales

Estimates of land rent in England and Wales, Great Britain, and United Kingdom have been made by Procter Thomson (1951) and J. R. Bellerby (1953, 1954). The underlying primary information is partly sampled gross rents from farms, partly assessments for taxation purposes. There are many difficulties with these data; I refer here in particular to Bellerby. Everything considered it seems to me that the only unbroken and reliable series of comparable data is that of R. J. Thompson for England and Wales for the period 1900 to 1933 on a per acre basis. I quote from Procter Thomson (1951, Table 30, Col. 2) who quotes from Central (Country?) Landowners Association (R. H. Rhee), The Rent of Agricultural Land in England and Wales, 1870-1946. Gross rent includes rent of dwellings, repair and maintenance (in particular of drains), etc. and a major problem is to construct net rent figures, relevant for our purpose. For the years 1913 to 1929 there exists maintenance estimates by Sir William Dampier (1930). R. J. Thompson argued that these were biased. Procter Thomson assumes that the ratio between net and gross

Table I.5

France: Nominal and Real Rent of Land, 1895-05 - 1935-38

	Produit brut aux prix des marche, fr. mill. courants (1)	Produit brut, deflaté fr. millions de 1905-11 (2)	Implicit deflator, 1905-11 =100 (1)/(2) (3)	Total rent, fr. millions courants (4)	Total territoire agricultural, ha millions (5)	Rent per ha, fr. courants (4)/(5) (6)	Real rent/ha in 1905-11 prices (6)/(3) (7)
1895-04	7,536	9,149	82.4	2,000	(46)	(43.5)	(52.8)
1905-11	10,266	10,267	100	2,225	46.5	47.9	47.9
1920-24	35,400	10,548	335.6	4,140	46.6	88.8	26.5
1925-34	66,900	11,909	561.8	8,258	45.95	179.7	32.0
1935-38	61,000	12,894	473.9	8,115	45.35	178.9	37.8

Sources: Col. 1 - Toutain, Table 103.
Col. 2 - Ibid., Table 112.
Col. 4 - Proctor Thomson, 1951, Table 14, col. 3.
Col. 5 - Toutain, Table 146, Col. 11.

Table I.6

England & Wales: Nominal and Real Rent of Land, 1900 and 1933

Year	Gross rent, England & Wales, £/acre	Net to gross rent ratio, U.K., percent	Estimated net rent, England & Wales, £/acre	Implicit deflator, food, 1900=100	Real rent, England & Wales, at constant 1900-prices £/acre, Gross	Net
	(1)	(2)	(3) = (1)x(2)/100	(4)	(5)	(6)
1900	1.0042	43.7	0.4388	100	1.0042	0.4388
1933	1.0794	40.5	0.4372	148.8	0.7254	0.2938
Rate of change, percent p.a.					-0.98	-1.21

Sources: Col. 1 - Procter Thomson (1951, Table 30, Col. (2), p. 152).

Col. 2 - J. R. Bellerby (1954, Table I, Col. 5, pp. 357-58).

Col. 4 - C. H. Feinstein (1972, Table 62, Col. (1), p. T134).

rent was the same in 1900 as in 1913 and thus arrives at a ratio of 0.68 for 1900 and 0.47 for 1933. Bellerby utilizes in addition estimates by a Royal Commission Report (C-8125) and by R. J. Thompson, but apparently he adjusted Dampier's estimate, taking into account good and bad times, unknown how. He thus ends up with a ratio of 0.437 for 1900 and 0.405 for 1933. Since Thomson's ratio before 1913 is a pure guess, I prefer to use Bellarby's ratio which at least has some underpinning. For deflation we should preferably use an agricultural output price index. No such index appears to be available. I have therefore used Feinstein's implicit food expenditure deflator (1972, Table 62, p. T134).

[Table I.6]

Since the net to gross rent ratio is the weakest point in this estimate, it should be emphasized that in using Procter Thomson's ratio we would arrive at a net rent for 1900 about 50 percent higher and also a somewhat higher negative rate of growth from 1900 to 1933. For the international comparisons these differences are not significant.

Appendix II

Profit Rates in Egypt and the United States

i. Egypt

Data on profit rates are almost exclusively based on company statistics, collected by government, consulates and private persons. The available data are: nominal and paid-up share capital (ordinary, preference, "souissance", and founders' shares, the two latter nothing but titles to dividends or bonus), reserves, payments of dividends and bonuses, debentures issued and distributions of debentures by nominal interest rate. This information is available for individual companies and classified by activity. Here we shall concentrate on returns to equity (shares plus reserves). The official statistics aimed at including companies "travaillant principalement" in Egypt. Such companies might be registered abroad or in Egypt. Reporting was voluntary. Family owned companies often preferred not to report at all or did not report dividends and reserves. Companies in liquidation represent special problems, in particular from the end of 1907 and 1908. The Suez Canal company, actually registered in Egypt and representing 15 percent of total capital (paid-up shares, circulating debentures and book-reserves) is included in the official statistics but is excluded here. Apart from the Canal zone and some tourism, the Suez canal company had little direct impact on the Egyptian economy once it had been established.

Principles of book-keeping are not known; corporate income taxation did not exist until World War II. Foreign registered companies would have to comply with foreign law and foreign owned companies would probably use accounting methods considered appropriate in the foreign country in question.

Such companies would be under the jurisdiction of the Mixed Courts which, however, would consider book-keeping methods only in special cases, such as fraud and bankruptcy (Brinton, 1968, p. 106-07). Since we shall define the rate of "visible profit" as dividends and bonuses plus increase in book reserves, measured as a percent of paid-up share capital plus book reserves, methods of asset evaluation are crucial for our measured profit rates. Depreciation charges were probably calculated on historical values but it is not known to what extent reserves include depreciation charges. Appreciation of land and other assets often formed the basis for dividend payments and increased book-reserves and during the years of speculation 1904-07, shady practices were widespread. A decree of 1906 banned new founders' shares but otherwise government interference and monitoring was minimal. Among liabilities only shares, debentures and reserves are reported. Short-term debts are unknown except for a few companies publishing balance sheets. Many companies held substantial financial assets. Indeed, financial intermediaries played a dominating role in terms of capital. Our definition of return to equity is at best an imperfect proxy for the rate of return to real capital which is what we are aiming at. Comparability with U.S. data, however, recommends this definition.

[Table II.1]

Our information is put together in Table II.1. From 1907 official statistics are available. For the years 1899, 1902 and 1906 we rely on Crouchley's estimates based on consular and official material. Data for reserves are not available before 1907. Col. 1, the rate of dividends measured on share capital paid up, is fairly reliable and so are increases in net reserves and "visible profits" in Col.s 2 and 3 although the increase in net reserves could only be computed as averages for the years 1911-13,

Table II.1. Dividend and Profits Rates, Egypt, 1899-1939

Year	Egypt, all companies* — Rates, percent of Share capital paid-up — Unadjusted: Dividends (1)	Unadjusted: Increase of net reserves (2)	Unadjusted: Visible Profits (3)	Adjusted for companies not reporting: Dividends (4)	Adjusted for companies not reporting: Increase of net reserves (5)	Adjusted for companies not reporting: Visible profit (6)	Rates, % of share capital paid-up plus reserves: Visible profits adjusted for companies not reporting (7)
1899	9.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1902	8.8	n.a.	n.a.	n.a.	n.a.	n.a.	
1906	9.5	n.a.	n.a.	n.a.	n.a.	n.a.	
1911	5.2	2.7	8.0	5.3	2.8	8.1	5.9
1913	5.4			5.4			
1928	10.5	0.6	9.4	11.4	0.7	10.2	7.6
1931	7.1			7.7			
1934	6.3	2.4	4.4	6.9	-2.5	5.0	3.7
1937	7.4			8.1			
1938	6.8			7.5			

* Not including Suez Canal Company

Sources: Col. 1-6 - 1899, 1902, 1906: Crouchley, 1936, p. 150.
1911 and 1928-39: Statistique des sociétés anonymes, 1911, 1928, 1931, 1934, and 1939.
1913: Annuaire Statistique, 1915.

1920-31, 1931-34, 1934-37 and 1937-39. Here this figure is reported only for 1911-13, 1928-31, and 1934-39. The adjustment for companies not reporting is based on footnotes and other auxiliary information in the official publications and is not fully accurate. The margin of error is small, however. Col. 7, finally, reports adjusted visible profit as a percent of paid-up share capital plus reserves, one possible measure of the rate of profit.

Tables II.2, II.2A and II.? report a somewhat different approach. In so far as the purpose is to obtain proxies for the rate of return to physical capital this approach is probably superior but strictly it can only be applied to the years 191? (1911) and 193?, and even for 1913 (1911) there are difficulties. The approach is similar to Davis & Huttenbach estimates of "returns to total capital with the important exception that we here use total visible liabilities as a proxy for physical capital. This means that we have at best a proxy to physical capital at historical values. It is worth noticing that depreciation of physical capital does not seem to have been included in reserves. Thus net return are truly net of depreciation. They are also strictly after tax; corporate income taxation did not exist before World War II but corporate business may have paid property tax in the big cities and land tax in rural areas. These remarks apply also to Table II.1. The rate of profits for the aggregates of all companies found for 191? (1911) and 193? are remarkably similar to those found in Table II.1.

[Table II.2]

[Table II.2A]

[Table II.?]

Table II. 2

Return to Total Capital, Corporate Business*

Egypt 1913

Activity	½ Increase in reserves 1912&1913 LE000	Interest payments LE000	Dividend payments LE000	Total returns LE000	Total capital[a] LE000	Total returns percent
	(1)	(2)	(3)	(4)	(5)	(6)
Mortgage banks	1012	1570	879	3461	60057	5.76
Other banks	99	0	321	420	8207	5.12
Financial, other	-66	0	20	-46	1238	-3.72
1. Financial	1045	1570	1220	3835	69502	5.52
Land development[c]	215	83	181	479	9213	5.20
Urban " [d]	92	108	77	277	11284	2.45
2. Urban-land dev.	308	191	258	757	20497	3.69
Land transportation	71	98	242	411	5555	7.40
Maritime "	33	5	55	93	847	10.98
Water supply, urban	1	10	215	226	1338	16.89
3. Infrastructure	104	113	512	729	7740	9.42
Ginning, pred., ref.[b]	33	124	65	222	1384	16.04
Construction ind.	10	2	4	16	440	3.64
Food ind.	53	8	76	137	1582	8.66
Other ind.	51	18	73	142	1957	7.26
Industry	147	152	218	517	5363	9.64
5. Trade	32	3	84	119	1363	8.73
6. Hotels	32	24	30	86	2037	4.22
Total	1668	2053	2322	6043	106502	5.67
Total - 1. Fin.	623	483	1102	2208	37000	5.97

* Excl. canals, sugar, mining. [a] Paid-up equity and debentures, adj., reserves - losses. [b] Excl. sugar. [c] Incl. irrigation. [d] Incl. urban-rural, miscelaneous.

Sources: See next page.

Tables II.2 and 2A

Sources: Col. 1 - Calculated from Annnuaire Statistique, 1914, Ch. XVI, Tabl.V and Annuaire Statistique, 1915, Ch. XXVIII, Tabl.I.
Col. 2 - Calculated from Ann. Stat., 1914, XXVI, Tabl. IV.
Col. 3 - Ann. Stat., 1914, XXVI, Tabl. I, Col.11.
Col. 5 - Total capital as in Ann.Stat.1914, XXVI. Tabl.I, Col.10 with some adjustments plus reserves from Ch. XVI, Tabl.V.

Table II.2A

Returns to Total Capital

Companies Chiefly Operating in Egypt, 1911*

Activity	1912-13 ½ increase in reserves LE000	Interest payments LE000	Dividend payments LE000	Total returns LE000	Total capital[a] LE000	Total returns percent
	(1)	(2)	(3)	(4)	(5)	(6)
Mortgage banks	1012	1451	899	3362	54652	6.2
Other banks	99	0	333	432	8210	5.3
Financial, other	-66	0	26	-40	1833	-0.0
1. Financial	1045	1451	1258	3753	64695	5.8
Land development[c]	215	103	172	490	8559	5.7
Urban development[d]	92	110	72	274	9758	2.8
2. Urban-rural dev.	308	213	244	765	18317	4.2
Land transportation	71	85	2453	399	5289	7.6
Maritime transport.	33	5	28	66	934	7.1
Water supply, urban	1	11	211	223	1380	16.2
3. Infrastructure	104	101	482	687	7599	9.0
Ginning, pres., ref.[b]	33	124	62	111	1258	8.8
Construction ind.	10	1	3	14	526	2.7
Food industry	53	8	53	114	1462	7.8
Other industry	51	20	66	137	1991	6.9
4. Industry	147	45	184	376	5237	7.2
5. Trade	32	8	82	122	1675	7.3
6. Hotels	32	28	21	81	2105	3.8
Total	1,668	1846	2271	5785	99628	5.8
Total - financial	623	395	1013	2032	34933	5.8

* Ecl. canals, sugar, mining. [a] Paid-up equity, debentures, reserves - losses, adj.
[b] Excl. sugar. [c] Incl. irrigation. [d] Incl. urban-rural, miscelaneous.
Sources: see next page.

Table II.3

Return to Total Capital, Corporate Business*

Egypt 1938

Activity	Increase in reserves[a] LE000	Interest payments LE000	Dividend payments LE000	Total returns LE000	Total capital[b] LE000	Total returns percent
	(1)	(2)	(3)	(4)	(5)	(6)
Mortgage banks	-444	562	606	724	31126	2.33
Other banks	63	1	545	609	10081	6.04
Financial, other	-87	2	18	-68	745	-9.07
1. Financial	-468	564	1169	1265	41954	3.02
Land development[c]	-1	22	137	157	5802	2.71
Urban " [d]	-293	27	205	-60	9531	-0.63
2. Urban-land dev.	-294	49	342	97	15332	0.63
Land transportation	10	55	139	203	6523	3.12
Maritime "	-64	0	32	-32	913	-3.54
Water supply, urban	69	3	408	480	1438	33.39
3. Infrastructure	15	58	578	651	8874	7.34
Ginning, press., ref.	-263	61	349	147	4974	2.96
Construction ind.	-27	0	103	76	1419	5.37
Food ind.	-90	3	155	68	1802	3.78
Other ind.	66	58	213	337	6634	5.08
4. Industry	-315	123	820	628	14830	4.24
5. Trade	-95	7	290	203	10827	1.88
6. Hotels	27	8	31	67	1653	4.02
7. Mining	10	0	304	314	2920	10.76
8. Miscellaneous	-10	0	24	14	873	1.56
Total	-1129	809	3559	3239	97263	3.33
Total - 1.Finan.	-661	245	2390	1974	55308	3.57

* Excl. canals. [a] Reserves + provisions - cum. losses. [b] Paid-up equity and debentures plus reserves (def. as in Col.1). [c] Including irrigation. [d] Incl. urban-rural.

Sources: All columns - Statistique des sociétés anonymes, 1937, 1939.

Considering the shortcomings of the official company statistics and of the approaches leading to Tables II.1-3, it was decided alternatively to use estimates of real returns to equity. The information used here is more reliable. Table II.4 then reports real returns to equity for five companies 1903-13 with considerable interpolation for capital gains 1909-12 and inflation 1910-13. For the averages 1903-09, 1910-13 and 1903-13 the interpolations are not important, however. Arithmetic averages were used for yields and inflation but for the capital gains compound interest was computed to avoid the ambiguities otherwise implied by the very strong annual fluctuations. Table II.5 reports for a larger albeit fluctuating number of companies 1913 and 1927-38. Concerning the averages similar remarks apply. The results, however, are difficult to compare with those of Tables II.1-3. We shall discuss this problem in the text.

[Table II.4]

[Table II.5]

Table II.4

5 Egyptian Companies* - Common Stock Paid-up

(unweighted averages)

Year	Market Price January Par = 1	Rates of (percent)				
		Dividends	Yields	Capital Gains	Inflation	Real Returns
	(1)	(2)	(3)	(4)	(5)	(6)
1900	1.7785a	7.45a	5.43a			
1901	1.8225a	7.40	4.47a	-5.01		
1902	1.7979a	8.20	4.33a	11.72		
1903	1.9816	8.80	3.92	6.79	6.40	4.31
1904	2.1564	10.20	5.40	82.23	14.80	72.83
1905	3.4000	9.80	3.27	-10.55	4.10	-11.38
1906	2.9976	11.51	4.49	1.13	3.40	2.22
1907	3.0113	12.00	4.32	-29.20	3.40	-28.28
1908	2.0675	12.15	6.43	9.39	3.50	12.32
1909	2.2289	11.95	5.76	-0.30aa	0.00	5.46
1910	2.2263aa	10.95	4.29	-0.31aa	-9.90	13.88
1911	2.2236aa	12.00	5.67	-0.32aa	4.30aa	1.05
1912	2.2209aa	11.70	5.73	-0.32aa	4.30aa	1.11
1913	2.2183	10.90	5.54	-8.22	4.30aa	-6.98
Average 1903-13			4.98	1.94	3.51	3.41
" 1903-09			4.80	4.48	5.09	4.19
" 1910-13			5.31	-2.35	0.75	2.21

a - Some interpolation. One company missing.
aa - Interpolation.
* - NBE, Salt & Soda, Pressage et depots, Alex. Water, Alex and Ramleh.

Sources: Col.1 - 1900-09, The Egyptian Gazette, daily; 1913, Ann.Stat., 1914.
Col.2 - Ann. Stat.; Papasian, 1926; N.B.E., 1948.
Col.3 - Hansen, Oct.1979, Table III.21.

Note: Col. 4, averages compound. Holding Jan.-Jan.

Table II.5

Companies Mainly Active in Egypt*- Common Stock Paid-up

(weighted averages)

Year	Market Price January Par = 1	Rates of (percent)				
		Dividends	Yields	Capital Gains	Inflation	Real Returns
	(1)	(2)	(3)	(4)	(5)	(6)
1912	1.0916					
1913	1.1086	6.23	5.62	-9.69	4.3	-8.37
1927	2.3971	12.57	5.24	18.32	-2.58	26.14
1928	2.2864	12.72	5.56	6.65	0.66	11.55
1929	2.8803	13.47	4.68	-22.60	-1.32	-16.60
1930	2.3534	12.76	5.42	-18.42	-6.67	-6.33
1931	1.8167	8.73	4.80	-25.10	-1.43	-18.87
1932	1.4021	9.14	6.52	32.36	-6.52	45.40
1933	1.8382	9.12	4.96	12.47	-4.65	22.08
1934	2.0344	8.61	4.23	1.41	4.06	1.58
1935	2.0953	8.45	4.03	1.93	2.34	3.62
1936	2.2995	12.90	5.61	11.43	-0.76	17.04
1937	2.5507	9.84	3.86	-11.28	-0.77	-6.65
1938	2.2818	10.03	4.43	-15.01	1.69	-12.27
Average 1927-38			4.95	-2.14	-1.33	4.14
" 1927-36			5.11	0.23	-1.69	7.03

* Not including Compagnie Universelle du Canal Maritime de Suez. Only including companies with information about both stock market prices and dividends. Col. 4 averages compound. Holding Jan.-Jan. Inflation Jan.-Jan. Both yields and capital gains are measured on stock market values in January.

Sources: Col.s 1-4 - Statistique des sociétés anonymes par actions travaillant principalement en Egypte, July 1939 and December 31, 1911, 1928, 1931, 1934, 1937, Min. des finances, Le Caire; Ann. Stat. 1914 and 1915.
Col. 5 - Ann. Stat. , several years, COL.

ii. United States

U.S. data for the rate of profit before 1929 are also unsatisfactory. For the sake of comparison with Egypt we concentrate on corporate business.

[Table II.6]

The superior series is Cristensen & Jorgenson's (1973, Table 10) estimate of "own rates of return" for the corporate sector based on national accounts. It measures returns net of capital gains and after tax but extends only back to 1929. Table II.6, Col.3 shows averages for 1929-31 and 1934-39. Periods are here chosen so as to compare with Table II.1 for Egypt. Own rates of return increased slightly between the two periods.

Profit rates based on NBER samples of large companies in manufacturing are shown in Col.2, a and b. The only year available for the pre-World War I period is 1914. This is also an after tax rate of profit. In Col.2.a the denominator is the nominal book value of shares plus reserves. In Col.2.b the denominator is the nominal book value of inventories plus fixed capital less depreciation. The numerator is net profit after taxes. It includes net financial income. The two methods give rather similar results and indicate an upward trend. Notice that both methods agree with C.& J. in so far as averages for 1929-31 are below those for 1934-39. Measured on book values of assets or liabilities both methods probably exaggerate the rate of profit although this may be less obvious for the years of deflation during the Great Depression and after.

Amongst other estimates of the U.S. rate of profit going back to the years before World War I we should mention Kendrick & Sato (1963, p.975) who claim that for the U.S. "The historical estimates show that there has

been little trend in the rate of return on capital..." This statement is based on Kendrick (1961, p.125, Table 30) in which an index for "real income per unit" of physical capital in the private sector as a whole develops from 84.1 in 1899 to 86.1 in 1919, 100 in 1929, and 82.8 in 1937, to 125.8 in 1948 and 95.2 in 1957. Kendrick's index is not directly comparable with the rate of profit in the corporate sector and it is not included in Table II.4.

Apart from the Kendrick estimate for 1899, a crude extrapolation, incidentally, for the period before 1913-11 the Cowles volume with Common Stock Indexes (1938) appears to be the only available statistical material to throw light upon the rate of profits. In line with our estimates in Table II.1, Col.7 of the profit rate for Egypt, W.A.Lewis (1978, pp.100-01), working with the Cowles data for the U.S. suggests that earnings be measured on nominal share capital plus accumulated reserves to obtain a better proxy for returns to physical assets. Cumulating the differences between Cowles' earnings and dividend rates he computes an index for cumulated retained profits plus share capital which he then divides into Cowles' earnings rates to obtain earnings rates measured on share capital plus reserves. Lewis operates on the period 1871 to 1913. Applying the same method to the period 1900 to 1938, assuming earnings to be after tax (Cowles is not entirely clear at this point, but see p.42), we come up with the series in Table II.6, Col.1. Despite some obvious weaknesses pointed out by Lewis, this series also seems to indicate no clear long term trend.

As a benchmark for the level of the rate of profit, we, finally,

computed the average rate of profit, net after tax, by both methods applied to the IBRD sample, Col.s 2.a and 2.b, for all corporate business for 1934-39 (see Table II.6, Col.4). Complete data are here available only back to 1934. Profits here, as in the IBRD sample, include net financial income which, however, from the alternative computations appears to be small as in the IBRD sample.

Friedman & Schwartz (1982, Ch.10) have used the rate of growth of national income in nominal and real terms as a proxy for the rate of return to physical capital. This method has been discussed in the text.

For the comparisons with Egypt we need the rates of return to corporate equity. Estimates based on Cowles (1938) for 1897-1913, 1913, and 1927-36 are presented in Tables II.7 and 8 and comparisons with estimates by Ibbotson & Singlefield (1976) and Christensen & Jorgenson (1973) for overlapping years are presented in Table II.9. These tables serve mainly to demonstrate the close similarity of the I.& S. and Cowles series with the enormous volatility of both series.

Table II.6

Rate of Profits, After Tax, Corporate Business

United States, 1900-1939

(percent)

Years	Cowles, all stocks, adjusted	NBER, Manufacturing, large enterpr.		C.& J. own rate of return	All corporate business
	(1)	(2)		(3)	(4)
		(a)	(b)		
1900	3.10				
1900-06	3.41				
1910-14	3.68	4,86[b]	4.89[b]	3.2*	
1928-31	4.25	7.58	8.93[d]	4.9[c]	
1934-39	2.58[a]	6.87	7.86	5.2	4.2

[a] 1934-37 [b] 1914 [c] 1929-31 [d] For 1929-31 7.57 percent

Sources: Col. 1 - Cowles, 1938, Series E-1, earnings over nominal stock values adjusted for retained profits defined as the difference between rates of earnings and dividends, cumulated from 1871.

Col. 2 - Historical Statistics, (a) Series V304 divided by V300 + V301 + V302 + V303.
(b) V304 divided by V290 + V292.

Col. 3 - Christensen & Jorgenson, 1973, Table 10, b, Corporate Sector.

Col. 4 - Historical Statistics, V138 divided by V112 + V115. Before tax 5.1 percent. Computed as V138 over V124 + V125 + V126 + V127 - V128 3.6 percent.

Note: V292 and V115/capital assets minus reserves (depreciation)
V290 and V112 inventories
V300 and V124 preferred stock
V301 and V125 common stock
V302 and V126 reserves (retained, appr.)
V303 and V127 surplus
V128 deficit

*Extrapolated backwards from 1934-39 on the basis of Col.2.b.

Table II.7

Common Stock Mainly Traded or Listed on

New York Stock Exchange

(all stocks, weighted)

Year	Market Price January 1926 = 100	Rates of (percent)				
		Dividends	Yields	Capital Gains	Inflation Index	Real Returns
	(1)	(2)	(3)	(4)	(5)	(6)
1897	33.4	1.37	3.88	15.57	25	
1898	38.6	1.50	3.74	24.87		
1899	48.2	1.60	3.21	0.21		
1900	48.3	2.08	4.28	15.74		
1901	55.9	2.34	3.78	14.85		
1902	64.2	2.47	3.71	4.21	26	
1903	66.9	2.66	4.66	-20.92	27	
1904	52.9	2.34	4.20	25.89		
1905	66.6	2.51	3.53	17.42		
1906	78.2	2.92	3.83	-3.20		
1907	75.7	3.34	5.38	-28.40		
1908	54.2	3.04	4.94	32.47		
1909	71.8	3.31	4.31	11.42	27	
1910	80.0	3.56	4.80	-8.25	28	
1911	73.4	3.60	4.92	-1.50		
1912	72.3	3.66	4.85	1.65		
1913	73.5	3.61	5.37	-10.07		
1914					30.1	
Average 1897-1913			4.32	4.10	1.10	7.32
" 1903-13			4.62	-0.11	1.34	3.17
" 1903-09			4.41	2.59	0.54	6.46
" 1910-13			4.99	-4.66	1.82	-1.49

Sources: Col.s 1-4 - Cowles, 1938. Holding Jan.-Jan.
Col. 5 - Historical Statistics, E135.

Note: Averages in Col.s 4 and 5 compound.

Table II.8

Common Stock Mainly Traded or Listed on

New York Stock Exchange

(all stocks, weighted)

Year	Market Price January 1926=100	Rates of (percent)				
		Dividends	Yields	Capital Gains	Inflation	Real Returns
	(1)	(2)	(3)	(4)	(5)	(6)
1913	73.5	3.61	5.37	-10.07		
1927	105.6	5.64	4.77	27.27	-1.86	33.90
1928	134.4	5.97	3.98	37.80	-0.41	42.19
1929	185.2	6.62	3.48	-15.60	0.06	-12.18
1930	156.3	6.38	4.26	-28.79	-6.24	-18.29
1931	111.3	5.28	5.58	-48.34	-9.27	-33.49
1932	57.5	3.25	6.69	-14.61	-9.46	1.54
1933	49.1	2.55	4.05	51.93	2.20	53.78
1934	74.6	2.84	3.92	-6.03	2.54	-4.65
1935	70.1	3.04	3.88	42.80	2.35	44.33
1936	100.1	4.83	4.35	25.87	1.81	28.41
1937	126.0	5.44			2.55	
1938	82.2				-2.13	
Average 1927-36			4.50	2.34	-1.52	8.36

Sources: Col.s 1-4 - Cowles 1938. Holding Jan.-Jan.
Col.5 - COL, Federal Reserve Bulletin.

Table II.9

Nominal and Real Rates of Return to Equity and Corporate Property

United States, 1927-38

(percent p.a.)

Year	Rates of Return to Corporate Equity: Ibbotson & Sinquefield Nominal	Ibbotson & Sinquefield Real	Cowles Nominal	Cowles Real	Corporate Property: Christensen & Jorgenson Nominal	Christensen & Jorgenson Real
	(1)	(2)	(3)	(4)	(5)	(6)
1927	37.5	39.6	32.04	33.90		
1928	43.6	44.6	41.78	42.19		
1929	-8.4	-8.6	-12.12	-12.18	7.6	7.4
1930	-24.9	-18.1	-24.53	-18.29	-o.8	-2.8
1931	-43.3	-33.8	-42.76	-33.49	-6.5	2.2
1932	-8.2	2.1	-7.92	1.54	-9.1	-0.2
1933	54.0	53.5	55.98	53.78	-0.5	-0.4
1934	-1.4	-3.4	-2.11	-4.65	8.2	2.6
1935	47.7	44.3	46.68	44.33	6.2	4.2
1936	33.9	32.7	30.22	28.41	7.8	6.0
1937	-35.0	-38.1			13.1	6.3
1938	31.1	33.9			2.9	4.0
Average 1927-38	5.0	6.9				
" 1929-38	-0.9	1.1			2.9	2.9
" 1927-36	7.8	9.1	6.68	9.63		

Sources: Col.s 1-2 - Ibbotson & Sinquefield, 1976, Tables 1.A and 5.A.
Col.s 3-4 - Cowles, 1938, my computations.
Col.s 5-6 - Christensen & Jorgenson, 1973, Table 10, a. and b.

Appendix III

Factor Quantities in Egypt and the United States: Agriculture

i. Stock of capital in agriculture is here defined as exclusive of land but including all buildings. It also includes irrigation, drainage, and soil conservation facilities. Inventories of crops on farms are included for the United States; in the latest estimates these are not separated from livestock. Data for crop inventories are not available for Egypt. We are here faced with the problem of crops growing on the fields ("goods in process") which in principle should be included in the stock of capital. In the United States, the agricultural censuses are taken on Jan. 1 at which time crops on the fields are at a minimum and perhaps unimportant; in late Spring they might be at their maximum and dominate all other capital items. In Egypt, with continuous cropping and widespread subsistence farming at that time, a large proportion of the crops would either be on the fields or stored at the farms and undoubtedly be an important part of the stock of capital at any time of the year. I have (so far) "solved" this problem by simply ignoring growing crops. The same is the case with land improvement, clearing, etc. in the United States. Land improvement in this sense was unimportant in Egypt. Fertilizers (circulating capital) are not included. Human capital is not considered either.

For the United States the estimates are based on Tostlebe (1957, Tables 7 and 9) and Pavelis USDA, EES, (July 12, 1977). Difficulties with deflation and classification and my need of comparability with corresponding estimates for Egypt, forced me to estimate in terms of constant 1900-prices. I used Tostlebe's estimate for 1900 at current prices with the addition of one item

from Pavelis, natural resource capital, crudely deflated by me. This is the first column of Table III.1. The second column was obtained by inflating the individual items for 1900 at current prices in Col. 1 by the rate of increase from 1900 to 1940 at constant 1972-prices as estimated by Pavelis. Comparison of Tostlebe's estimates at constant 1900-prices and Pavelis' at constant 1972-prices indicates that Tostlebe greatly underestimated the growth rates of individual items (I hereby assume that the latest estimates are superior). Whether Tostlebe also underestimated the level for 1900, I cannot know. Had Pavelis' estimates been available at current prices, I would have used them also for the year 1900.

[Table III.1]

The estimates for Egypt are based on Radwan (1975, Tables 2-1 to 2-6). Radwan's estimates are at constant 1960-prices. Conversion to constant 1900-prices caused difficulties in particular for dwellings, livestock and

[Tables III.2 and III.2.A]

traditional tools. For dwellings I used an index of prices for major crops, assuming that prices of bricks and labor followed this index closely. For livestock I used an average of meat prices as deflator and for traditional tools I used the prices of modern machinery. The estimate for 1940 at 1900-prices was then done in the same way as in Table III.1.

ii. Land was for both Egypt and the United States measured in acres without any attempt of weighting. Weighting by rental values would be possible for both Egypt and the United States. For the United States I used the data for "land in farms". For Egypt I accepted the acreage figures given by Willcocks and Amin in their estimates of rental value (see Appendix I), but otherwise the official estimates were used (Ann. Stat.). The cultivated area changed little from 1897 to 1940.

iii. For labor a number of alternatives are available for the United States. I used Series D170 from Historical Statistics. The differences between D170, D153, and D16 are minor from our point of view. For Egypt census data are available for employment in 1907, 1917, 1937, 1947 and 1960 (Mead, 1967, Table II-B-1, p. 304). Extra- and interpolating crudely, I assumed that employment was 1.9 million around 1900 and 4.1 million in 1938, assuming employment to remain unchanged at this level until 1967.

Table III.1

Capital Stock in United States Agriculture, Million US-$ at Constant 1900-Prices

	1900 (1)	1940 (2)
Buildings	3,557	8,857
Implements and Machinery	750	2,347
Livestock	3,012	5,985
Crop inventories	1,389	
Natural resources capital	350	3,889
Total	9,058	21,078

Sources: Col. 1 - Tostlebe, (1957, Table 7, United States). Natural resource capital, my deflation from Pavelis' 1972-prices estimate.

Col. 2 - From Col. 1 and Pavelis (July 12, 1977, Table 1) as explained. I identified Tostlebe's "buildings" with Pavelis' "residential farm structures" plus "non-residential structures" and Tostlebe's "implements and machinery" with Pavelis' "producers' durable equipment".

Table III.2

Capital Stock in Egyptian Agriculture

£E millions, 1960 prices.

	Fixed Capital						Circulating Capital (Total Crop Value)	Total Capital
	Irrigation and Drainage	Dwellings	Livestock	Machinery	Traditional Tools	Total		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1900	69.1	26.6	39.4	3.3	2.1	140.5	201.4	341.9
1913	148.9	32.2	39.3	9.8	2.6	232.8	225.6	458.4
1920	158.7	34.5	40.3	7.4	2.7	243.6	203.4	447.0
1928	176.4	39.5	57.2	5.8	2.8	281.7	259.8	541.5
1938	329.7	45.7	77.0	8.6	3.0	464.0	304.1	768.1
1946	370.4	45.7	98.9	8.3	4.0	527.3	273.9	801.2
1950	388.5	45.9	86.7	15.5	4.5	541.1	306.2	847.3
1955	428.9	46.2	75.9	22.6	4.9	578.5	326.3	904.8
1960	476.6	47.6	85.2	29.1	5.4	643.9	384.7	1,028.6
1967	729.9	71.2	96.2	43.4	6.1	946.8	433.0	1,379.8

Sources: Cols. 1-6 - Radwan (1973, Tables II, 2-6)
Col. 7 - Hansen (Oct. 1979, Table III-27, Col. 1) and Wattleworth (1975, Tables XLIX and XLIII)

Table III.2.A

Capital Stock in Egyptian Agriculture

1900 - Prices

Million £E	1900	1913	1920	1938
Irrigation & drainage	13.0	28.0	29.9	62.0
Dwellings	5.9	7.1	7.7	10.1
Livestock	8.6	8.6	8.8	16.8
Machinery	0.5	1.5	1.1	1.3
Traditional tools	0.3	0.4	0.4	0.4
Total	28.3	45.6	47.9	90.6

Sources: Radwan (1973, Tables 2-1 to 2-6); Ann. Stat. de l'Egypte, several issues; Wattleworth (1975, Table XLIII).

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