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HISTORICAL ESTIMATES OF NATIONAL ACCOUNTS MAGNITUDES IN GREECE: 1830-1939

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Abstract

The study of long run economic development is facilitated immensely by the existence of relevant data. In this context, long run national accounts magnitudes are probably the most important. This has been realized since the early 1950s by economists of the stature of Kuznets, Friedman and North and relevant time series have been estimated, originally for countries like the U.S.A. and Great Britain and subsequently for other developed and less developed countries. In Greece, however, the first relevant attempt undertaken in recent years appeared in 1995, previous estimates, dated in the early 1950s and before, having been "forgotten" in time. In this article, these earlier estimates are reviewed (JEL: N13-14).

1. Introduction

In a 1995 article[1] Bart van Ark reviewed recent developments in historical national accounting in Europe. In this review relevant efforts regarding Northern, Western and Southern European countries were cited while the author also noted that ".. cautious first attempts are being undertaken for the East European countries as well". In this discussion no mention whatsoever was made of Greece.

This is hardly surprising as it appears that at the time[2], with the exception of a rather crude effort by P. Bairoch (1976)[3], there were indeed no other "recent" estimates of Hellenic National Accounts magnitudes referring to the pre-WWII period. This impression may be enhanced when publications such as that by Bairoch (1978)[4] are taken into consideration, while any doubts that might remain are dispelled in a most definite manner by Dertiles (1993)[5].

What is noteworthy here is that whereas it is true that no "recent" estimates had indeed been published in early 1995, this cannot be attributed ei-

ther to the lack of the necessary basic data or to the total absence of relevant work at an earlier point in time[6]. In other words it does not seem that there is a complete lack of a "tradition" in such work, i.e., something that would partially, at least, explain why this is observed.

In fact, some work has been done on the subject and a number of National Income estimates for a few pre-WWII years have been made, all, however, long ago. More specifically, these efforts were mostly undertaken from the mid-1920s up to the early 1950s, although some of them are dated even earlier. Of these estimates some can be encountered in various publications, not all of which are Greek[7,8].

One possible reason conceivably explaining the lack of more recent work on the subject may be the absence of relevant interest on the subject. Another may have to do with the enormous difficulties inherent in such a task, difficulties that lead to the impression that it was unfeasible. Whatever the case, the result was that two, or maybe three, generations of Greek economists and economic historians did not include the subject among their research interests and refrained from addressing the matter.

In the present context, and having been associated with both recent attempts to estimate historical national accounts magnitudes for a substantial time period in Greece[9], it seems fitting to refresh our memories by recalling the earlier efforts made to estimate relevant magnitudes. This paper then, is essentially a survey of these works. In it, quite a few interesting points are revealed and pointed out when the earlier estimates, and the methods used, are compared between them as well as with the more recent ones. Finally, it is hoped that it will dispel any false notion that may exist to the effect that no estimates whatsoever were made in the country while bridging a gap of more than forty years on the subject.

2. Concise Presentation of Concepts and Definitions

In order to evaluate the historical estimates it appears useful to review, albeit in a very concise manner, certain elementary concepts, methodological points and definitions and determine the extent to which these were understood at the time the estimates were made. It is needless to say that the most elementary definitions will be used[10].

To begin it would seem that, in the context of appraising those earlier estimates, of major importance is whether concepts such as double counting and transfer payments were understood and how they were treated. Relevant also

is the treatment of illegal activities such as smuggling, which in the case of Greece was, at certain times at least, rather important.

In the same context, of relatively smaller significance are the subjects of imputing production values for certain activities (i.e., owner-occupied houses) and for payments in kind (i.e. food to the military).

The question of the method used to make the estimates was more or less answered by the limitations presented by the available statistics. Thus, the core of the method usually used was the industry of origin procedure. As might, however, be expected this was used in conjunction with the income and expenditure methods which permitted the determination of certain components of National Product that could not be estimated with the output method.

Turning to the definitions of the national accounts magnitudes eventually estimated, the basic distinction regards domestic vs. national product. On balance, given the limitations of available statistics, domestic product was estimated[11]. A further distinction regards gross vs. net magnitudes, depending on whether capital depreciation is allowed for.

Finally, differences in the estimates result from the manner according to which the evaluation has been made. This can be done in market prices and/or at factor cost. The first approach includes indirect taxes[12] in the estimate, which, of course, do not raise the level of national income and should be compensated for at the government sector.

In practice, i.e. in the efforts made, it appears that in general the attempt is to evaluate production at factor cost[13].

The concepts mentioned and their precise definitions are, of course, relatively modern developments. In some of the earlier estimates, however, the authors were mostly preoccupied with the estimation of National Wealth and secondarily with that of National Revenue. In fact, in some of the cases examined revenue was derived on the basis of return rates on wealth which had already, itself, been (indirectly) estimated.

In the tables that follow in the end of the presentation, an effort is made to specify the magnitude in terms of modern terminology. This can only be done approximately and, in some cases, the definitions may have been stretched to the limit.

Finally, in most cases the figures refer to nominal, and not real, magnitudes.

3. The Estimates - General Characteristics: An Overall View

In general, most of the estimates made, referred to a single year. In this respect certain authors make single year estimates in more than one instances, i.e., for more than one years. The most characteristic such case is Mulhall, four estimates of whom have been detected, the earliest referring to 1883 (?) - the latest to 1908. Among the other authors, Rediades and Evelpides appear to have been most persistently occupied by the subject both making more than one single year estimates[14]. Finally, more than one single year estimate have been made by Official Agencies. Of these, the Ministry of Finance made several attempts in between 1919 and 1929[15]. In all, estimates referring to twenty-six distinct years have been detected (Table 1).

By comparison, estimates for a series of years have definitely been made in far fewer cases. In all, five such attempts have been detected (Table 2)[16], although it would seem that in reality most of these consist variations of the same theme, i.e. that they are all based on Evelpides' estimates[17]. The only exception to this appears to be Mousmoutes' (b) series (Table 2b, col. 4).

As a rule, there is some confusion regarding the magnitude estimated, especially when an effort is made to define it in modern terms. This, as might be expected, is more true for the earlier estimates that for the latter ones. Overall, in the earlier cases the efforts seem to be to estimate "National Wealth", "National Revenue" being of relatively less interest to the authors. By comparison, the later authors are mostly preoccupied with estimating "National Income".

The methods used stem from sophisticated and, relatively, detailed (i.e. Bernardakis, Mulhall, Rediades, Dertiles and Evelpides), in which cases a rough approximation of primary, secondary and tertiary production can also be derived, to simplistic and general (Skiadas, Zolotas, Angelopoulos, Athanasiades), where only a rough total is given. In some cases the methods were not disclosed, or, at least, could not be found published (Soutsos, various official estimates). When at least some relevant information regarding methodology is given it appears that the backbone of the estimates has been made by the use of an approximation of the output method. Various items estimated directly or indirectly are subsequently added to this basic total.

Finally one might note that whereas most estimates have been made by Greeks, a few estimates made by non-Greeks have also been detected (Mulhall and the Dresdner Bank). In this context one can not rule out the existence of other such estimates which have been lost in time[18].

HISTORICAL ESTIMATES OF NATIONAL ACCOUNTS MAGNITUDES FOR GREECE (1830-1939)

TABLE 1: Single Year Estimates (values in current prices and current drachmas)

No	Auhtor	Year		Source/other references	Magnitude Estimated	Method of Estimation		Value Estimated		
		of Publication	of Estimate				Total (000) drs	Sector		
								Primary (000) drs	Secondary (000) drs	Tertiary (000) drs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Soutsos	1871	latest possible 1871 (?)	Dertiles (1993)	National Income (?)	(?)	280.000			
	Soutsos (adj)						258.000			
2	Bernardakis	1885	Adds up data from various years (1875-1884) as well as averages	Bernardakis (1885)	Value of Production (gross)	Adds up gross prod. values (including imputations)	651.180			
	Bernardakis (adj)						650.103	264.486	10.000	375.617
3	Mulhall (a)	1884	latest possible 1883 (?)	Rediades (1930	National Income (?)	(?)	575.000 656.420			
4	Official Report (Mulhall)	1896	1888	Mulhall (1896)	National Earnings	See Mulhall (1896) below	670.000 853.044			
5	Skiadas	1891	author's date 1891	Skiadas (1891) Rediades (1930)	National Revenue /Income	Method of Alf. de Foville	660.537			
6	Mulhall (b)	1892		Mulhall (1892)	Annual Earnings of Income	Combination of "value added" and indirect estimates	no estimate			

Table 1 (continued)

No	Auhtor	Year		Source/other references	Magnitude Estimated	Method of Estimation		Value Estimated		
		of Publication	of Estimate				Total (000) drs	Sector		
								Primary (000) drs	Secondary (000) drs	Tertiary (000) drs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
7	Mulhall (c)	1896	1894?	Mulhall (1896)	Annual Earnings of Income	Combination of "value added" and indirect estimates	690.000	232.500	130.000	327.500
						The coefficients used differ from those he used in the "Dictionary" (1992)	1.206.948	406.689	227.396	572.863
8	Mulhall (d)	1909	1908	Rediades (1930)	(?)	(?)	725.000	250.000	125.000	350.000
				Dertiles (1993)			785.320	270.800	135.400	379.120
9	Dresdner Bank		1913	Clark (1960)	Income at factor cost	(?)	1.500.000			
10	Tsouderos	1920	1916	Tsouderos (1920)	Gross Value of production	Sum of gross production values of various activities	1.637.000	752.000	825.000	60.000
11a	Min. of Finance (a)	1919	1918/1919	Rediades (1930)	"National Income"	(?)	1.000.000			
11b	Tandalides		1918/1919	Rediades (1930)		(?)	2.000.000			

Table 1 (continued)

No	Auhtor	Year		Source/other references	Magnitude Estimated	Method of Estimation		Value Estimated		
		Of Publication	Of Estimate				Total (000) drs	Sector		
								Primary (000) drs	Secondary (000) drs	Tertiary (000) drs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
12	Rediades (a)	(i) 1921 (ii) 1930	1919	Rediades (1930)	"National Income"	Method based on Pareto's formula	31.500.000 (2.100.000 gold drs)			
13	Angelopoulos	1927	1925	Angelopoulos (1927), Rediades (1930), Evelpides (1938)	"National Income"	Indirect Method based on Financial Data	16.000.000			
14	Rediades (b)	1930	1927	Rediades (1930)	"National Income"	Utilises Angelopoulos' method	30.540.000			
15	Kafandaris (Sacalis)/ Min. of Finance (b)	1928	1927	Rediades (1930), Evelpides (1938)	"National Income" ?	?	30.000.000			
16	Zolotas	1929	1927	Zolotas (1929), Rediades (1930), Evelpides (1938)	Net National Income (current prices)	A rough equivalent of the output method	46.913.000	21.750.000	4.198.000	20.965.000

Table 1 (continued)

No	Auhtor	Year		Source/other references	Magnitude Estimated	Method of Estimation		Value Estimated		
		Of Publication	Of Estimate				Total (000) drs	Sector		
								Primary (000) drs	Secondary (000) drs	Tertiary (000) drs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
17	Evelpides (a)	1938	1927	Evelpides (1938)	(i) National Production (pp. 380-381)	A rough equivalent of the output method	35.630.0000 $467.259	17.169.659 $ 225.167	10.085.451 $ 132.263	8.374.791 $109.929
					(ii) National Income (pp. 380-381)	Adds certain services to National Production	45.171.901 $592.395	17.169.659 $225.167	10.085.451 $132.263	17.916.791 $234.965
					(iii) National Income (p. 427)		44.393.000	16.576.000	7.613.000	20.204.000
18	Dertiles, P.B.	1932	1928	Dertiles P.B.(1932), Evelpides (1938)	National Income	Combination of Income and Output approaches	48.320.200 45.000.000	16.667.400	5.500.000	26.152.800 22.832.600
19	Sacalis	not published ?	1929	Rediades (1930)	"National Income"	?	38.415.000 41.000.000	18.840.000	5.000.000	14.575.000
20	Min. Of Finance (c)	1930 ?	1929	Rediades (1930)	"National Income"	?	45.000.000			
21	Rediades (c)	1930	1929	Rediades (1930), Evelpides (1938)	"National Income"	(a) Production method (b)"Expenditure method"	34.700.000	14.600.000	4.000.000	16.100.000

Table 1 (continued) 45

No	Auhtor	Year		Source/other references	Magnitude Estimated	Method of Estimation		Value Estimated		
		Of Publication	Of Estimate				Total (000) drs	Sector		
								Primary (000) drs	Secondary (000) drs	Tertiary (000) drs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
22	Athanasiades	1932	1930	Evelpides (1938)	National Income ?	Pareto's equation	51.341.000			
23	Evelpides (b)	1937	1934	Evelpides (1937)	Net Income of Farmers			18.318.000		
24	Evelpides (c)	1938	1936	Evelpides (1938)	National Income	Production method	59.368.000	22.000.000	10.180.000	27.188.000
25	Rediades (d)	not published ?	1936 ?	Evelpides (1938)	National Income ?	Approach based on tax returns	62.000.000			
26	Kyrkilitses	1947	1938	Mousmoutes (1950)	Net National Product	Approach based on Production Meth	67.373.200	28.220.900	12.867.400	26.284.900

TABLE 2a

Estimates for a Series of Years
(estimates current prices / figures in 000 LMU drs)

Year	Kostelenos (KEPE) (1995) GDP Production	Kostelenos et al. (NBG) (2000) GDP Production	Year	Kostelenos (KEPE) (1995) GDP Production	Kostelenos et al. (NBG) (2000) GDP Production	Year	Kostelenos (KEPE) (1995) GDP Production	Kostelenos et al. (NBG) (2000) GDP Production
1833		49.328	1859	142200	166.176	1885	522.400	404.370
1834		60.111	1860	168700	152.206	1886	588.300	427.885
1835		76.038	1861	181700	150.281	1887	497.000	445.553
1836		64.874	1862	147200	154.490	1888	515.400	457.844
1837		71.131	1863	164600	160.134	1889	542.700	441.012
1838		76.561	1864	201800	187.269	1890	550.400	463.711
1839		82.159	1865	196500	182.285	1891	566.300	506.075
1840		90.511	1866	241000	194.258	1892	556.800	530.183
1841		81.524	1867	252300	227.098	1893	599.700	550.345
1842		72.051	1868	235100	217.616	1894	501.600	497.796
1843		70.305	1869	236700	193.019	1895	595.900	519.172
1844		72.287	1870	241.200	230.486	1896	532.600	551.490
1845		72.555	1871	242.800	263.454	1897	599.300	512.248
1846		77.311	1872	257.800	221.460	1898	606.900	568.609
1847		70.202	1873	270.800	239.560	1899	597.800	542.817
1848		78.740	1874	278.300	256.489	1900	553.400	585.319
1849		81.072	1875	284.000	256.007	1901	615.000	663.880
1850		89.726	1876	314.500	246.853	1902	605.000	638.047
1851		93.492	1877	311.700	280.196	1903	655.100	623.985
1852		111.072	1878	329.100	287.894	1904	643.100	572.453
1853		102.916	1879	403.200	284.472	1905	666.900	579.592
1854		118.870	1880	373.900	294.015	1906	657.200	604.517
1855		109.909	1881	411.600	340.537	1907	741.800	646.723
1856		151.599	1882	378.600	378.493	1908	697.400	638.397
1857		145.800	1883	382.000	402.037	1909	755.700	689.465
1858	134700	136.395	1884	427.100	409.598	1910	715.100	660.869

TABLE 2b

Estimates for a Series of Years
(estimates current prices / figures in 000 drs)

Author	Mousmoutes (a)	Malanos	Evelpides	Mousmoutes (b)	(i) Clark/ (ii) Mitchell	Kostelenos (KEPE)	Kostelenos et al. (NBG)
Year of Publication	(1946)	(1948)	(1950)	(1950)	(i) (1960)/ (ii) (1975)	(1995)	(2000)
Magnitude	National Income ?	Domestic Product	Net National Income	National Income ?	NNP	GDP	GDP
Method	Production	Production	Production	Production	Production ?	Production	Production
Number of Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	Estimates Made						
1911				934.000		936.900	847.500
1912				1.048.000		1.033.900	823.900
1913				1.163.000			856.700
1914				1.267.000		1.900.800	1.235.800
1915				1.597.000		1.761.500	1.420.900
1916				2.310.000		1.926.100	1.882.900
1917				3.470.000		2.700.400	2.689.000
1918				4.712.000		6.001.100	4.196.200
1919				5.051.000		5.484.800	3.789.800
1920				6.000.000		6.690.200	5.361.500
1921				5.778.000		7.932.400	6.821.700
1922				12.504.000		13.629.600	10.780.100
1923				21.120.000		20.891.100	16.558.600
1924				23.630.000		23.453.300	20.718.300
1925				26.732.000		27.446.100	23.992.300
1926				31.581.000		33.245.300	28.217.000
1927	39.728.000		44.062.000	36.044.000	44.100.000	34.607.000	30.874.800
1928	41.648.000	46.130.000	46.128.000	38.752.000	46.100.000	37.601.600	33.619.000
1929	39.569.000	44.530.000	44.529.000	36.272.000	44.500.000	41.538.900	32.387.800
1930	37.601.000	42.700.000	42.701.000	34.697.000	42.700.000	36.911.100	31.089.900
1931	34.334.000	39.400.000	39.404.000	32.358.000	39.400.000	38.131.000	29.751.900
1932	38.595.000	43.470.000	43.665.000	37.159.000	43.700.000	39.924.400	33.071.900
1933	43.898.000	49.120.000	49.123.000	42.597.000	49.100.000	44.309.600	38.350.000
1934	46.695.000	52.480.000	52.475.000	45.609.000	52.500.000	47.323.700	42.085.600
1935	48.527.000	54.990.000	54.989.000	49.009.000	55.000.000	52.078.700	44.494.200
1936	52.528.000	59.270.000	59.368.000	52.957.000	59.400.000	57.435.000	46.725.400
1937		61.950.000	67.692.000	57.647.000	67.700.000	69.356.700	56.570.800
1938		64.630.000	72.342.000	62.338.000	67.400.000	65.389.000	55.688.800
1939	60.614.000	67.300.000	67.250.000	64.297.000	67.200.000		54.836.300

Notes: (1) Mousmoutes, N.D. (1946). As stated by the author, the estimates are essentially those made by Evelpides with adjustements having been made to the tertiary sector (services). (2) Malanos, G.J. (1948). The figures and reference are taken from C. Bandaloukas (1951). The estimates refer to national income in market prices in 1928 drs. (3) Evelpides, C, (1950). The estimates were most probably made and published in other publications before 1946. Thus it would seem that these were the estimates adjusted by Mousmoutes. (4) Mousmoutes, N.D., (1950). The figures are taken from N. Mousmoutes (1950) and also appear in Dertiles (1993). (5)(i) Clark C., (1960), pp. 148-149. The figures refer to Income at factor cost and are taken from Evelpides. (5) (ii) Mitchell B.R., (1976), p. 786. The figures refer to Net National Product and are taken by the author from the UN (1950). The difference with Clark is that they have been rounded up by one more digit. (6) Kostelenos, G. (1995). (7) Kostelenos, G., Petmezas S., et al. (to be published).

4. The Estimates - Discussion and Comparisons

Having completed the presentation of the general characteristics of the estimates, the next step is to proceed to the comparisons between them. In order to facilitate this task the NBG series will be used as the yardstick, in relation to which the others will be plotted. Furthermore, the KEPE[19] series will also be depicted in the diagrams and used as a supplementary reference.

On the basis of the common characteristics shared by the "historical" estimates it is possible to discern three periods.

- (a) 1830 (1870)-1910 (diagram 1)

In this period the estimates are characterised by the fact that they are essentially not defined in accordance to modern concepts. In effect these estimates consist attempts to estimate "national wealth / national revenue", while in most cases the precise year they refer is unclear.

As can be seen from the diagram all these estimates, with the exception of Soutsos', are considerably larger than the NBG (as well as the KEPE) series. The reasons for this vary.

Mulhall for instance does make a deliberate attempt to avoid double counting. On the other hand he makes a rather extensive use of coefficients and these may be a source of overestimation[20]. In addition the basic data was furnished to him by Greek authorities who may have had an interest to project a rather optimistic picture of the Hellenic economy[21].

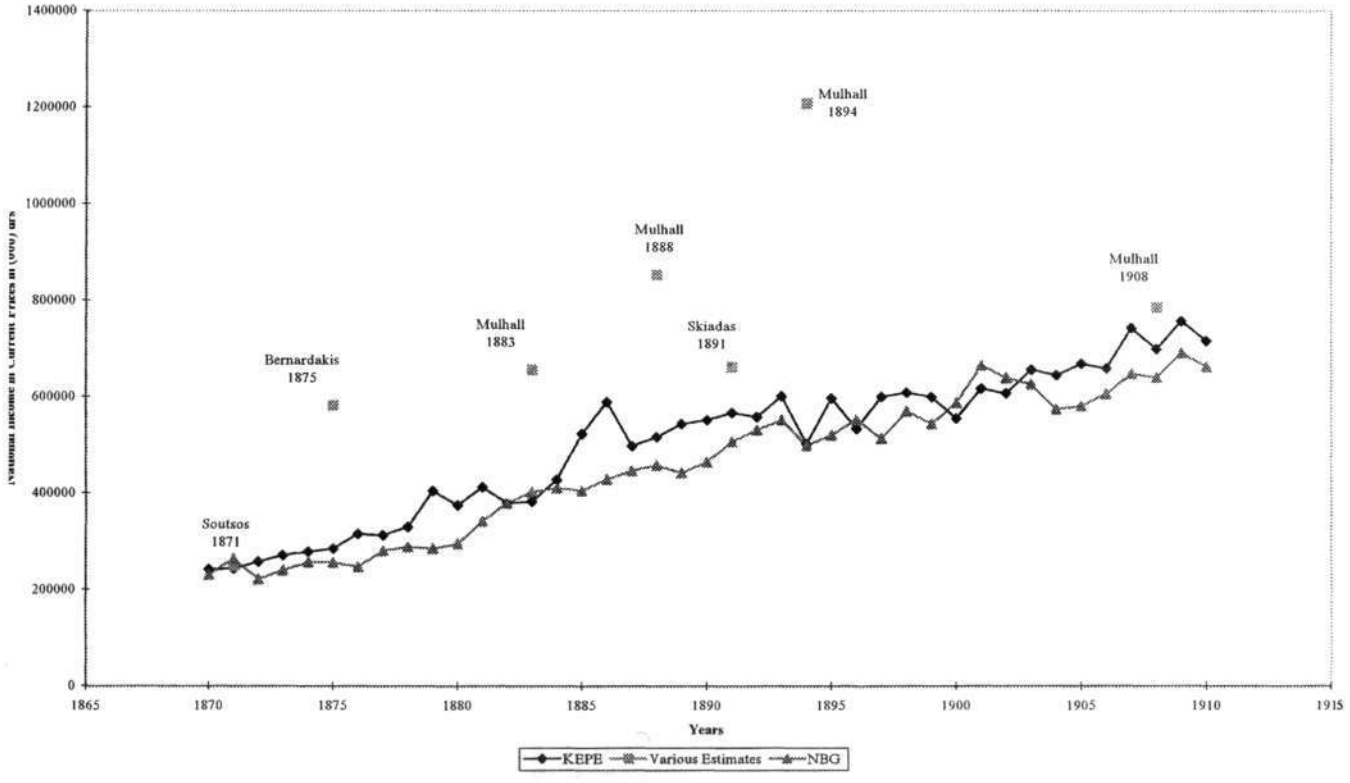
Mulhall's figures, even when the official exchange rate is used for the drachma-sterling equivalence[22], are higher than all the estimates for nearby years of the KEPE series. This also nullifies the possible argument that the deviations might be due to the estimates referring to another year.

Bernardakis' estimate does not allow for errors resulting from double counting. In addition, the author does appear to overestimate production as can be gauged in the instances when data are also available from other sources and comparisons can be made. Again the figure is larger than any one estimate of the NBG (or the KEPE) series for the period 1875-1884.

Skiadas' estimate has been made with an entirely different logical procedure. In fact, when this is taken into account in conjunction with the fact that the author was striving to prove a point, i.e. that the country's finances were

DIAGRAM 1

Historical Estimates of National Account Magnitudes in Greece 1870-1910 49



healthy, it is surprising that the figure is so close to the NBG (and even closer to the KEPE) estimate.

Finally, Soutsos' figure[23] is a wonder. The methodology the author used is not known whereas the proximity of his result to both the NBG and KEPE estimates is obviously amazing.

• (b) 1911-1926 (diagram 2)

During this period there exist mostly single-year estimates which, however, do appear to be a bit more sophisticated from a conceptual point of view. In addition, there exists a series of estimates made by Mousmoutes in 1950. Once again the principal yardstick used is the NBG series.

In this case, contrary to what was observed in the previous period, the single year estimates are, as a rule, smaller than the corresponding figures of the NBG series (as well as of the KEPE and the Mousmoutes series). The exception in this case is the Dresdner Bank estimate, about which no details could be unveiled[24].

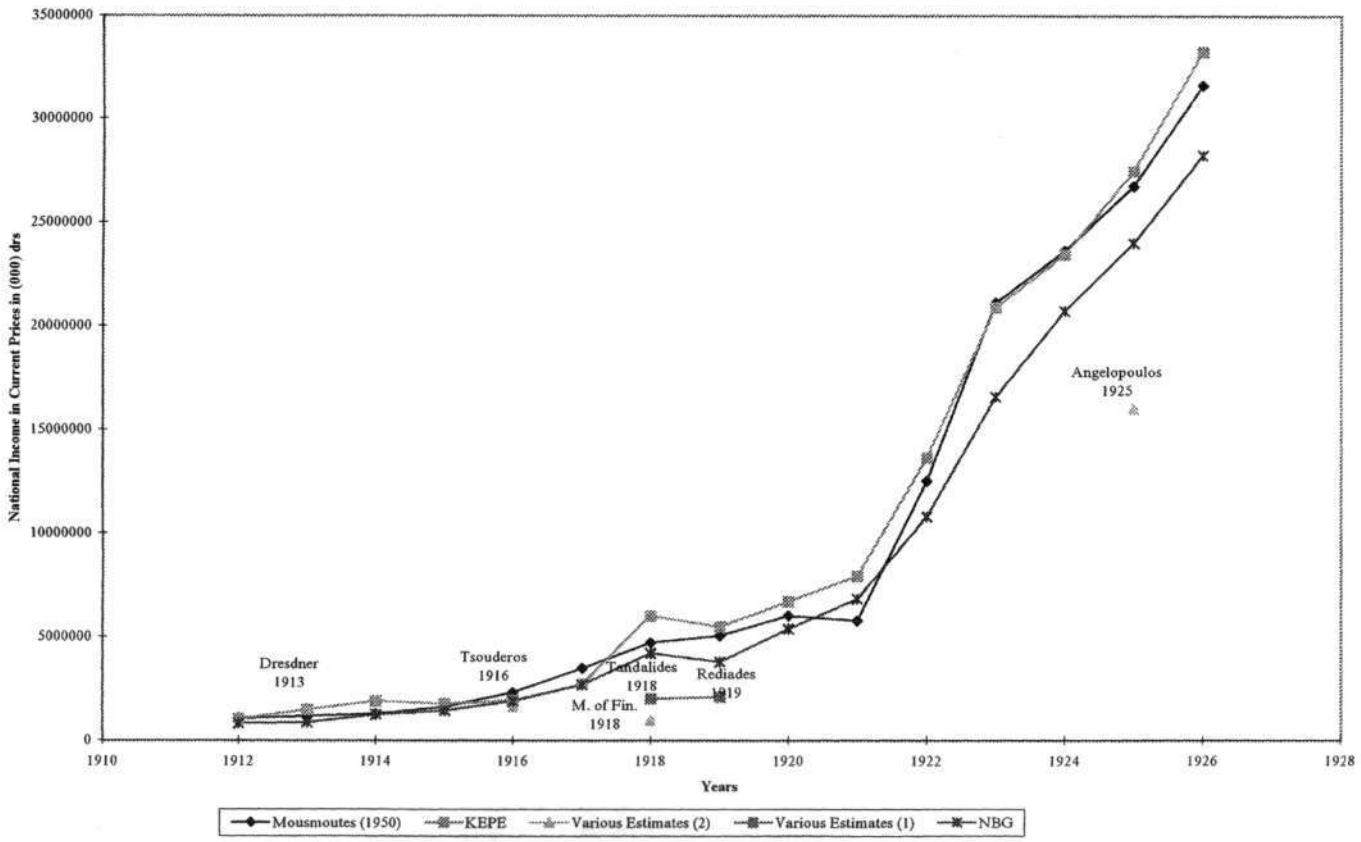
Starting with the Tsouderos estimate and moving onto those for 1918-1919 one observes that the deviations of the single year estimates from the corresponding figures of the three previously mentioned series increase considerably. To begin, the 1918-1919 estimates are clearly of questionable reliability. In addition, it seems that the large deviations that they exhibit from the three series are, partly at least, due to their inability to cope with the increased inflation of the period. This would seem to explain why Rediades' 1919 estimate is so much below the three series whereas, as will be seen in diagram 3, Athanasiades' 1930 estimate is so much above them when both use the Pareto approach. Finally, another point that is not clear is whether these estimates refer to the whole of the country or only to the Athens-based part of it[25].

The last single year estimate of this period is that by Angelopoulos. This is based on income tax returns and other figures, not all of which refer to 1925, i.e., the year the estimate is attributed to. As a consequence the estimate is inherently unreliable to begin with. In addition, one always has to admit that income tax returns are a very poor basis to infer income from. Therefore, the underestimation is expected for more than one reasons.

Moving on, the comparison of the Mousmoutes and the NBG series, both of which were made at a latter time, yields interesting results. Thus, on balance, these series would seem to move more or less together up to 1918, to be

DIAGRAM 2

Historical Estimates of National Account Magnitudes in Greece 1911-1926



close to each other but vary in different manners (the Mousmoutes series being flatter) up to 1922 and to move in a parallel manner after 1923. Between 1921 (a trough) and 1923 the Mousmoutes estimates increase considerably.

Mousmoutes explains his approach in the context of the presentation of his estimate for 1938, a year for which his figure is very close to the KEPE estimate and clearly larger than the NBG figure. He uses the production method and derives a figure for National Income at factor cost. His estimate is a net one in as much he makes allowances for depreciation. Finally, the author states that he uses the same method to derive the figures all the way back to 1911.

Overall, if one excludes the 1921-1923 years, the Mousmoutes series exhibits a smaller variation than both the NBG and KEPE series. In 1917 it is higher and in 1921 lower than both them, in 1918-1920 in-between them, whereas for the sub-period 1922-1926 it is quite close to the KEPE series. In fact, the Mousmoutes estimates are close to the KEPE estimates in all but two instances, the exceptions being 1918 and 1921[26].

As regards 1918, the Mousmoutes estimate appears to have adjusted for the strange behavior exhibited during that year by the movement in prices as depicted by the relevant data given by the National Statistical Service of Greece. By comparison the KEPE estimate has accepted this movement at face value.

Finally, the large decline shown by Mousmoutes in 1921 appears to be a result of his figures being influenced more than the NBG or the KEPE estimates by the catastrophic events of the Asia Minor expedition.

• (c) 1927-1939 (diagram 3)

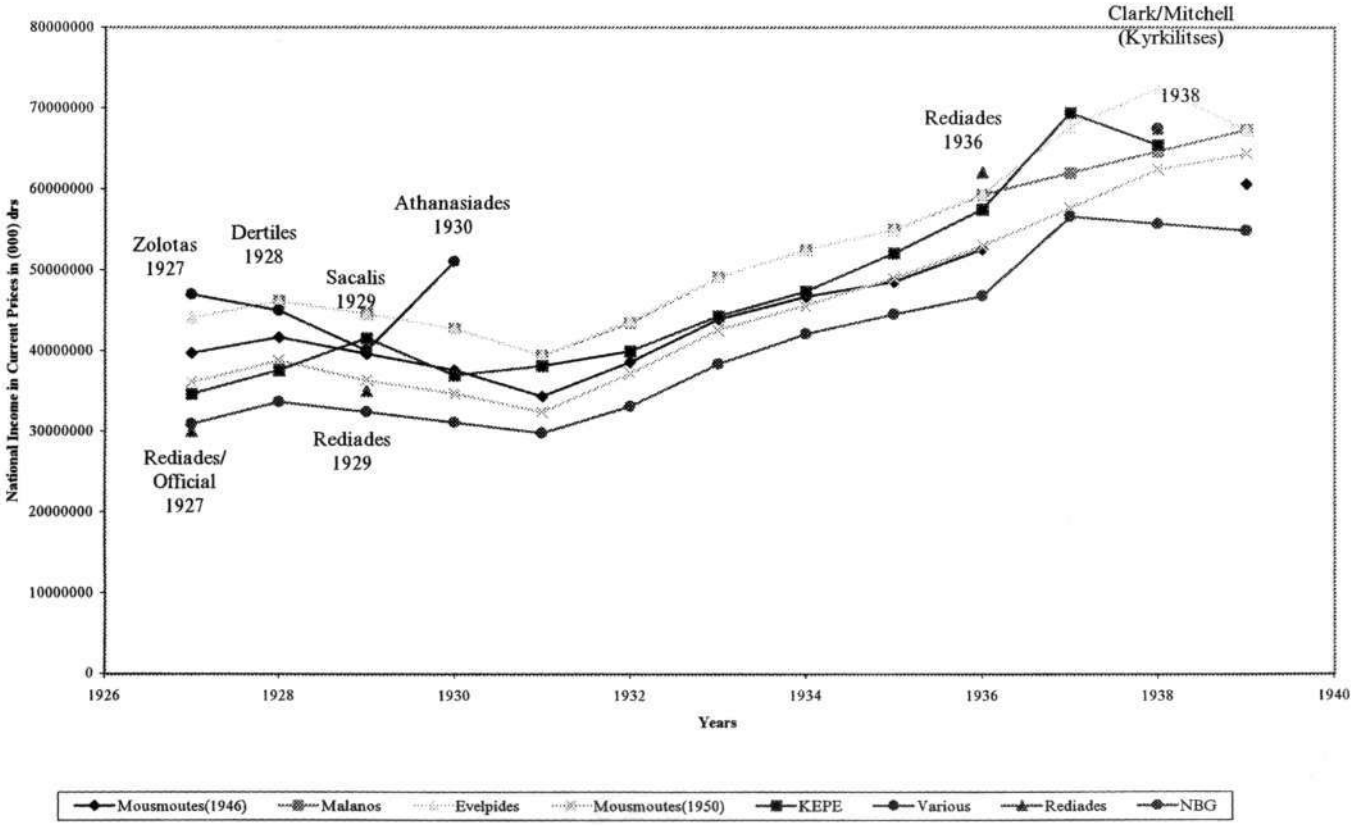
The estimates of this, the latter of the three periods examined, are, as a rule, conceptually closer to modern day estimates. This characterises both the single year estimates and the series.

Two points must be clarified here

1. the first, regards the inclusion of the 1938 figure cited by Clark/Mitchell among the single year estimates. This has been done because although these authors use the Evelpides' series for 1927-39[27], their 1938 figure differs clearly from that given by their (stated) source. In fact, it appears that the figure these authors adopt is an estimate made by Kyrkilitses, which will be discussed later on.

DIAGRAM 3

Historical Estimates of National Account Magnitudes in Greece 1927-1939



2. the second regards the omission from the diagram of the Ministry of Finance estimate for 1929. The figure, 45 billion drs, is clearly much larger than all other single year estimates for that year and slightly larger than those by Malanos and Evelpides, while the methods used for its estimation have not been disclosed.

Most of the single year estimates are higher than those of the NBG series, the exception being the official 1927 estimate and Rediades' first, of his three, estimate. In fact, Rediades is critical of the four, larger, single year estimates (for 1927-1929) which he considers gross exaggerations.

Furthermore, excluding the two figures cited and Rediades' second estimate, i.e. that for 1929, the single year estimates are also larger than those of the KEPE series.

It regard to Rediades' 1927 estimate[28], it is to be expected that it will be small relatively to the other single year estimates as the author uses an income-like approach, i.e. similar to that used by Angelopoulos in 1925. Thus, the same arguments relevant in that case apply, more or less, in this one. As for his 1929 estimate, the reasons its size, relatively to the other single year estimates, is small can be found in the criticism by Evelpides and need not be repeated here. What is, however, of interest is that it appears that Rediades changed his views later on, as his 1936 figure, for which no details regarding methodology used could be found, is larger than all other estimates for that year.

As already noted, of the five[29] other estimates for 1927-1930, four are larger than the corresponding figures in the NBG (as well as of the KEPE) series.

Of these, the Zolotas estimate has been negatively critisised both by Rediades and Evelpides. Among the arguments these authors use one can easily identify those that explain why the figure might be expected to overestimate production. In particular, Zolotas is said to use figures that are larger than those given by official sources and to deduct a very small percentage for seeds[30].

Most of the difference between the Dertiles figure for 1928 and those by the NBG and KEPE for the same year is caused by the inclusion of figures for items such as sericulture, grazing fields, fishing, hunting, pensions and emigrants remittances. The rest can be attributed to differences in the estimation of inputs both in the primary and secondary sector.

The Sacalis estimate for 1929 has not been published and no details regarding methodology used could be found. The same is true for the official estimate for 1927 which, in fact, was also made under the supervision of Sacalis. Rediades considers these two figures inconsistent[31] and attributes this to the influence of Zolotas' publication on the size of the latter, of the two, estimate.

Finally, Athanasiades' estimate for 1930 and the Clark/Mitchell-Kyrkilitses figure for 1938 are obviously subjected to different logical processes. Thus, Athanasiades used an indirect approach based on the Pareto equation which, according to Evelpides, is expected to overestimate the magnitude sought. On the other hand, Kyrkilitses (assuming that it is indeed his figure that is being quoted by Clark and Mitchell)[32], estimated Net National Product at factor prices using essentially the production approach and working within the context of the operation of a UNRRA committee. This figure has been strongly critisised by Mousmoutes who believes that it to be too large[33].

Of equal, if not more, interest is the comparison between the series of estimates. In this respect, of the seven series appearing in table 2 three are the most interesting.

More specifically, the Mitchell/Clark series has already seen to be the Evelpides series, while the KEPE and NBG series are more or less equivalent, the latter being an improved version of the former. Still, although it suffices to include only the latter of the two in the discussion, certain references to the earlier will also be made.

A slightly more complicated case is the Malanos series. This is the same as the Evelpides series save for two years, 1937 and 1938, where the Malanos figures are much smaller[34]. Similarly, the Mousmoutes (1946) series is also closely related to the Evelpides series. Thus, as the author himself admits, his figures are a revised version of the Evelpides figures, which he adjusted downwards by making corrections for services.

Mousmoutes proceeded later on to revise his 1946 estimates, the result being his 1950 series. He, too, used the production approach and his original/bench mark estimate was made for 1938. In this context he compared his figure with Kyrkilitses' and asserted that the latter overestimated the true magnitude significantly. He considered this, essentially, to be a result of Kyrkilitses' overestimating primary production. Finally, Mousmoutes extended the method he used for 1938 and made estimates all the way back to 1911.

From the above it follows that the three series that truly differ and must be discussed are those by Evelpides, Mousmoutes (1950) and the NBG, whereas, in a few cases, certain references to the KEPE series must also be made.

In this context, the comparative movements between the Mousmoutes (1950) and NBG series have already been discussed for the period up to 1925. Starting in 1926 it is seen that they continue to move in a, more or less, parallel manner up to 1936, the difference between their respective magnitudes remaining roughly constant. Then, in 1937 the jump in the NBG series is not matched by the Mousmoutes figure this leading to the two estimates being very close for that year. Finally, in 1938 and 1939 the Mousmoutes series continues to increase whereas the NBG falls.

By comparison, the Mousmoutes and KEPE series, which have already been seen to vary more or less in accordance up to 1925, exhibit important differences in 1929, 1931 and 1937.

Of these, the first two differences can be considered together as they consist a different way of viewing the effects of the Great Depression (1929) in Greece. In particular, Mousmoutes and the NBG series see the fall beginning in 1929 and reaching its lowest point in 1931, this implying a rather steep increase in 1932. On the other hand, KEPE sees an increase in 1929, a low point in 1930 and a very small increase (more or less a stagnant situation) in 1931[35].

Regarding now the overall differences between the Mousmoutes and the KEPE series, and trying to explain them on the basis of Mousmoutes' 1938 analysis, one must start by pointing out that this author allows for depreciation. Thus, it might be expected that the KEPE series gives larger figures for the primary sector. In addition the KEPE series gives larger figures for tertiary production and smaller ones for secondary production (within which, however, Mousmoutes includes construction), the differences regarding the first sector essentially accounting for the overall difference between the totals.

The above would seem to explain the differences in the timing of the 1929 crisis. Thus, on the basis of Mousmoutes' 1948 estimate, as well as on his 1946 discussion, one could say that this author's approach seems to give smaller weights to services and thus to the government sector, whose influence might have had a stabilizing effect during the crisis. This is also consistent with the differences between the NBG and KEPE series, the former also estimating a smaller value for services.

Finally, in 1937 one observes a different situation. Here the NBG and KEPE series show an increase, the largest part of which can be traced to increases in agricultural production. Given that the figures for this sector are more or less reliable one must accept the increase as being a true one and conclude that the Mousmoutes figure underestimates the increase in production in 1937[36]. The larger figure for services explains the size of KEPE figure in relation to that of the NBG. In this case the Evelpides, Mousmoutes and KEPE figures are all close to each other.

Turning now to the Evelpides series one notes that it lies above the NBG series throughout the period. In addition, it also lies above the KEPE series in all cases but one, the exception being in 1937. Assuming that the method used by Evelpides is that described in his 1938 publication, i.e. in the context of his estimation of national income for 1936, this can partly be attributed to the inclusion in his totals of items such as fishing and hunting, agricultural handicraft and emigrants remittances and invisibles in general. Of these items some may not go through the market, some were not estimated by the NBG (or KEPE), some, by present day definitions, are erroneously included in the total and some indicate that Evelpides was estimating Gross National Product and not Gross Domestic Product as was the NBG (and KEPE). It follows that the Evelpides figures must be expected to be higher. Thus, the interest of the discussion shifts to the comparison of the variation of the two series.

In this respect Evelpides' series behaves like the NBG and Mousmoutes series during the years one associates with the Great Depression (1929-1932), although exhibiting a bit milder variations. Overall, its only real difference from the movements depicted in the NBG series appears in 1938 where Evelpides sees a continuous increase (in fact a max point) and the NBG (and KEPE) a clear decline. Both series show a decline in 1939 whereas Mousmoutes continues to see an increase[37].

It is hard to try to explain why Evelpides' figure is so high in 1938. On this subject it must be recalled that questions regarding its reliability were probably also raised by whomever[38] adjusted the series published by Clark (and, much later by) Mitchell.

5. An After View

In summary one can argue that whereas the historical estimates of Greek National Accounts magnitudes were not many, some interest in the subject did exist, especially in the period after WWI. At that time quite a few prominent

economists appear to have realized the existence of the void and made efforts to fill it.

In general the estimates made covering the period after 1910 appear to have been decent ones, especially those that were made for a series of years. These obviously, demanded a much more sustained and consistent effort, although it would not be fair to say that most of the single year estimates derived did not require effort and determination.

More specifically, by adopting the average of the two most recent estimates (i.e. the KEPE and NBG series) as a yardstick against which the reliability of the other estimates is gauged and using Feinstein's grading scale for pre-1948 estimates as a reliability guide[39,40,41], one can note, by observing diagram (4), the following

- in the first subperiod, i.e. up to 1910, four of the seven estimates would be classified as conjectures, two (Mulhall (d) and Skiadas) as rough and one (Soutsos) as good. Here one cannot be critical, especially when the differences in concepts used is taken into account, while one must express amazement when considering Soutsos' estimate.

- in the second subperiod, i.e. 1911-1926, we observe negative deviations from the yardstick used in addition to positive ones. In particular most single year estimates appear to underestimate the true magnitude grossly and fail the reliability test. On the other hand, the Mousmoutes series appears to fluctuate around the magnitude within the limits of acceptability, save for one case in which he overshoots the yardstick figure badly (1917).

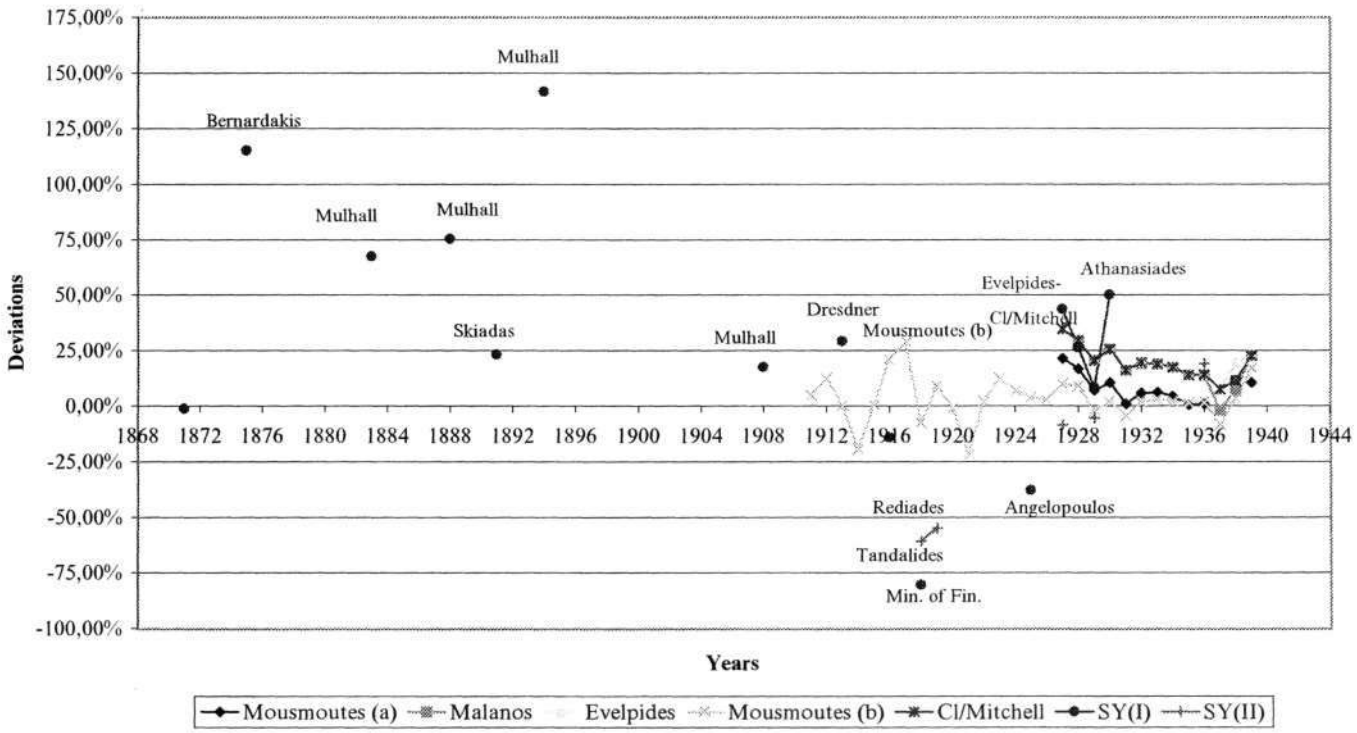
- finally, in the latter of the three subperiod, i.e. 1827-1939 the overall picture is one where the older estimates overshoot those of the yardstick mostly by a percentage smaller than 25%. The few exceptions refer to 1927 where the figures appearing to be unreliable are really only one, i.e. an estimate made by Evelpides (Athanasiades' estimate can be discarded as adhering to a totally different logic).

In conclusion, one cannot help but admit that these early efforts must command our respect irrespective of their shortcomings.

After WWII the effort became more systematic and national accounts magnitudes have been estimated, starting in 1948, by the National Statistical Service of Greece[42].

DIAGRAM 4

Historical Estimates of National Account Magnitudes in Greece 1870-1939
Deviations from Recent Estimates



Still the question remains why, until recently, no interest was exhibited in making new estimates for the pre-WWII period and carrying them backwards in time to cover the whole period of existence of the modern Greek State.

Notes

1. Van Ark, B., (1995).

2. In 1995 "Money and Output in Modern Greece: 1858-1938" was published by the Center of Planning and Economic Research (KEPE) in Athens.

3. Bairoch, P., (1976).

4. Bairoch, P., (1978).

5. Dertiles. G.B., (1993).

6. To be honest, not very much of which existed.

7. Indicatively one can mention the following: (i) Doblin, E. M., (1951); (ii) Clark, C, (1960); (iii) Mitchell, B. R., (1976); (iv) Maddison, A. (1989) and (1995).

8. It should be pointed out here that Maddison's references are taken from C. Clark.

9. The project, "Gross Domestic Product 1830-1939", was sponsored by the Historical Archives of the National Bank of Greece and will be published in the near future.

10. The basic reference used is Beckerman (1969).

11. This permits the omission from the estimates of a very important, in the case of Greece item, i.e. overseas shipping. The estimation of the value of production of this item is obviously quite a complicated matter.

12. And excludes subsidies.

13. In summary then, the definitions relevant here are:
Gross Domestic Product (market prices) + Net Property Income From Abroad
equals Gross National Product (market prices)
minus indirect taxes (net of subsidies)
equals Gross National Product (factor cost)
minus depreciation
equals Net National Product (factor cost) i.e. National Income

14. Rediades' first estimate is for 1919 and the last, most likely, for 1936, while Evelpides also made estimates for a series of years.

15. An official estimate is also cited by Mulhall for 1888. Official estimates were obviously not always made by the same people.

16. The two recent estimates made by Kostelenos (KEPE) and Kostelenos, Petmezas et al (NBG) are not included in this number.

17. For example, the Malanos (Bandaloukas) series is essentially the Evelpides series in all cases except for 1937 and 1938.

18. One can also not rule out the possibility of the existence of other such estimates made by Greeks that have not been detected.

19. The connotation is used to facilitate the distinction of the two recent works. In essence, these two sets of estimates were derived on the basis of the same methodology.

20. For instance, public service is estimated at 50% of national revenue.

21. The reason this might have been the case is to present a picture that would reassure foreign bond-holders that the State's obligations would be met.

22. It may be recalled that Mulhall's figures are in pound sterling.

23. Which has been adjusted for the new monetary unit effected in 1881, i.e. the Latin Monetary union drachmas.

24. The KEPE series has no estimate for 1913. The figure used here is the average between the 1912 and 1914 estimates.

25. The country was split up during part of the WWI period.

26. All other differences are obviously insignificant and demand no further comments.

27. For this reason there is no point in citing the rest of the Clark/Mitchell series separately.

28. Which is slightly larger than the official figure included in the diagram (30.5 billion vs 30 billion drs).

29. Six, five of which are larger than the NBG (and KEPE) series, if the 1929 figure by the Ministry of Finance is included.

30. In general it seems that double counting is not avoided, at least in the case of livestock production.

31. Naturally Rediades critisised the 1929 official estimate, which is very close to Zolotas' figure, even more.

32. It seems unlikely that Clark or the United Nations, whose figures Mitchell uses, used an interpolation (or average) between the 1937 and 1939 figures because they did not feel comfortable with Evelpides' 1938 estimate (which is much larger).

33. Kyrkilitses adopts Evelpides' figures for 1935 and 1936 and then proceeds to estimate a magnitude for 1937. This, however, is not of interest here as it consists an interpolation between his own 1938 estimate and Evelpides' 1936 figure.

34. The reason the Malanos series appears in diagram 3 and the Clark/Mitchell does not is that details regarding these estimates could not be found. Thus, one may assume that Malanos agreed with Mousmoutes that these figures were too large and used some other procedure to make his own 1937-1938 estimates or, alternatively, that the author adopted Mousmoutes' figures for these years.

35. In effect the picture projected by the KEPE estimates for 1928-1932 implies a more stable economy, less influenced by foreign developments, than that shown by the NBG and Mousmoutes.

36. In fact the author states that his 1937 estimate is an interpolation.

37. Mousmoutes sees a fall in income from trade in 1939 which, however, is not large enough to offset an increase in agricultural and industrial production.

38. It is conceivable that this was done by some statistician of the United Nations.

39. Feinstein (1971), pp 20-22. According to this scale the estimates, according to their margin of error, are graded as follows: A: Firm (margin of error less than 5%); B: Good (margin of error between 5% and 15%); C: Rough (margin of error between 15% and 25%); D: Conjectures (margin of error larger than 25%).

40. The KEPE series has no estimates for 1913 and 1939. Thus, for 1913 an interpolation of the 1912 and 1914 figures is adopted, whereas for 1939 the NBG figure is used.

41. This implies that the average of the two series is considered the closest approximation to the true series.

42. See: "National Accounts of Greece 1948-1970", Athens, 1972.

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