

**Research Unit for Statistical
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**Adjusting Hooley's Philippine GDP
(1902~40)**

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Adjusting Hooley's Philippine GDP (1902~40)¹

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Introduction

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Introduction

This paper aims to re-examine the accuracy of the Philippine GDP (Gross Domestic Product) series estimated by Professor Richard Hooley (Hooley 2005) and consequently make slight adjustments to it. With the understanding that the author's GDP time series statistics spanning 1902 to 1985, categorized by major industry groups and presented in 1985 prices, represent the latest estimates, we have meticulously reviewed the GDP worksheet. Subsequently, we have made necessary minor corrections specifically for the initial half of the series, covering the years 1902 to 1940.

The original statistical data for this study are located in two sub-files on an Excel sheet named "CCC" and "GDPREV," both housed within a file titled "Hooley's Master Presentation." Among these, the "GDPREV" sub-file holds the finalized GDP worksheet. This worksheet systematically compiles all the time series data, presented in both current and 1939 pesos, to represent their respective contributions to the nation's total gross value

¹ This paper focuses on the adjustment and revision of the historical GDP estimates published by Professor Richard Hooley. It also anticipates future efforts to enhance these estimates, particularly regarding the value added of the primary and secondary industries, as proposed by Mr. Keiya Eto.

I would like to express my sincere respect and gratitude to Dr. Pierre van der Eng for bringing this seminal article to my attention.

added. Conversely, the "CCC" sub-file contains two sets of final figures for industrial components along with their GDP totals. One set is derived from the "GDPREV" sub-file in constant 1939 pesos, while the other set is converted from 1939 to 1985 price bases. The latter set constitutes Table A, while the former corresponds to Table B².

1. Discrepancies in Construction Output

Initially, we meticulously crosschecked all time-series data values in the summary table of the journal against their corresponding values in the 1985 prices of file CCC (Table A). Remarkably, we discovered no variations between the two sets of data, except for a notable exception within the construction industry. Here, each figure presented in the journal had been uniformly reduced throughout the entire period by an average factor of 0.286 compared to the original data in Table A. The rationale behind this adjustment remains unexplained.

Upon uncovering this disparity, a compelling course of action emerges: substituting the annual 1985-priced data in the construction industry of Table A with the corresponding figures from the journal article. This revised version of Table A is hereby designated as Table A'.

2. Linking statistics with different time standards

To facilitate the cross-checking process, a critical step involves establishing links between time series represented in distinct time standards. It's worth noting that while the figures in constant 1985 pesos from the journal are evident, those found in Table B and sub-file GDPREV are denoted in 1939 pesos. Furthermore, it's imperative to recognize that the price linking ratios applied to various commodities (or services) tend to differ across time standards.

Professor Hooley's work introduced specific price linking ratios, to be implemented for statistics corresponding to the years following 1948, categorized by industrial sectors:

I. Agriculture, Fishery, Forestry

² In this and the following pages, the term 'Table' is used metaphorically, and does not serve as a container of statistical figures.

- I-a. Crops & Livestock: 70.99
- I-b. Forestry & Fishing: 70.99
- II. Industry Sector**
 - II-a. Mining & Quarrying: 23.27
 - II-b. Manufacturing: 90.14 I
 - I-c. Construction: 19.08
 - II-d. Electricity, Gas & Water: 156.35
- III. Service Sector**
 - III-a. Transportation, Communication and Storage: 78.03
 - III-b. Trade: 99.94
 - III-c. Finance: 99.94
 - III-d. Income from Owners' Own Dwellings: 99.94
 - III-e. Private Services: 55.56
 - III-f. Government Services: 27.78

To align the time series data from Table A', categorized by major industrial sectors and presented in 1985 pesos, with the 1939 time standard, each figure is divided by the corresponding linking ratio from above. This transformation yields a new set of values, collectively forming Table C, signifying the 1939 price version of Table A'.

3. Additional minor corrections

In the ensuing stage, we conducted a meticulous comparison of all statistical figures in Table C, excluding the construction industry which underwent substantial scaling down in Section 2. This comparison was performed against corresponding figures in Table B or sub-file GDPREV, and revealed several additional minor discrepancies as outlined below.

Firstly, a noticeable discrepancy emerged in the time series of economic activities related to free services (III-e above) across the entire period. Notably, the values designated as "peer group" in Table B surpass those in Table C by an average factor of 3.8. This discrepancy could potentially be attributed to an inadvertent double-counting of government labor costs and rental incomes during the estimation process for the sub-file GDPREV series.

Secondly, specific instances of variance in value added have surfaced within the transportation, communication, and warehousing industries (III-

a), specifically in the years 1902 and 1918. During these years, the value added for these industries in Table C remarkably falls to as low as 0.08 and 0.03, respectively, of the corresponding values in Table A'. In contrast, for all other years excluding these two, the value added for these industries in Table A' is approximately 0.98 times that of Table C.

Thirdly, further scrutiny of the figures in Tables A' and C uncovers non-uniform ratios of product values between the two sets. Specifically, ratios deviate as follows:

- 1.13 in agriculture (I-a) in 1902
- 0.95 in forestry and fisheries (I-b) in 1902
- 1.28 in government services (III-f) in 1938

To address these disparities identified in this section, corrections have been implemented based on the judgment that Table C accurately represents free services, while Table A' is more accurate for all other industries mentioned.

By amalgamating the corrected time series data from Tables A' and C, a comprehensive depiction of the adjusted Hooley's real GDP emerges. This adjusted portrayal is juxtaposed against its earlier renditions, facilitating a more comprehensive understanding (Figure 1).

4. Slightly revised implicit GDP deflators

In light of the substantial adjustments undertaken on the output quantities (expressed in constant pesos) within the construction industry, as elucidated in Section 2, a commensurate revision is necessitated for its output values (current pesos). To achieve this, we require pertinent price information. However, our original estimator did not furnish any guidance regarding the suitable price index for this purpose. In the absence of a more fitting alternative, we turned to the well-established prices of construction materials, a choice firmly embedded in sub-file GDPREV. Multiplying this price information, the nominal construction output series from Table A now forms an integral component of the historical nominal gross value added of the nation.

Across the other industries, alterations between the published figures and those in Tables A are minimal. Substantive modifications are confined to isolated instances in agriculture, transportation, communications, and service sectors. The production price indexes, or implicit industrial deflators,

delineated in Hooley's worksheet (sub-file GDPREV) are preserved as distinct price indices, excluding those applicable to the construction industry.

The cumulative nominal GDP values are derived by integrating the production price indexes (or industry-specific implicit deflators) with the corresponding quantity outputs listed in sub-file GDPREV, encompassing construction. This amalgamation furnishes the nominal series spanning the interval of 1902 to 1940, vividly presented against the previous series in Figure 2.

Through the utilization of the recalibrated time series portraying real and nominal values of the Hooley GDP, we arrive at the slightly revised, implicit GDP deflator for the specific period. This insightful depiction is captured in Figure 3, juxtaposed with its original iterations.

5. Concluding Remarks

Leveraging the GDP estimates provides a platform for both imaginative exploration and the generation of novel ideas. To further facilitate such endeavors, we seek Professor Hooley's gracious permission to harness the slightly refined renditions of his GDP series, enabling us to present additional diagrams, exemplified in Figures 5, 6, and 7 below.

For instance, Figure 4 portrays a rudimentary division of GDP into primary, secondary, and tertiary industries. Notably, the service industry consistently commands a significant position akin to that of the primary sector. In a similar vein, Figure 5 amalgamates the three output series from primary, secondary, and tertiary industries with estimated employment figures within these sectors. This juxtaposition reveals the average value-added labor productivities. Echoing a point Hooley (1968) elucidated years ago, this presentation underscores the gradual pace of progress in work efficiency across both the primary and industrial sectors.

References cited

Hooley, Richard, "American economic policy in the Philippines, 1902-1940: Exploring a dark age in colonial statistics," *Journal of Asian Economics*, vol. 16 (2005), pp. 464-488.

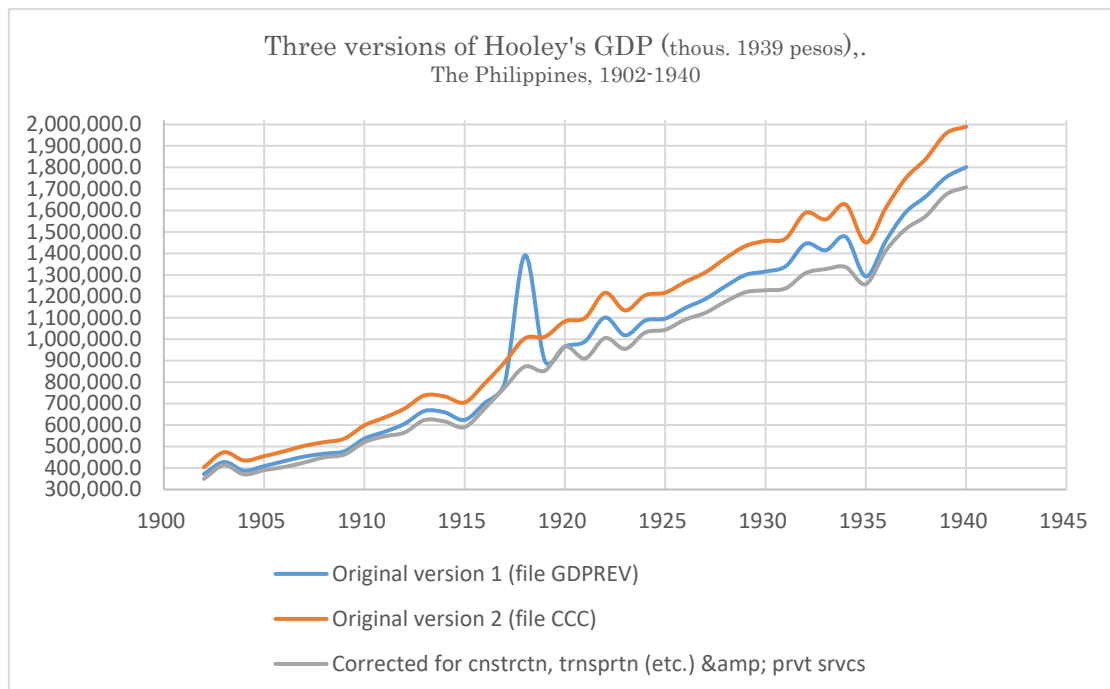
—————, "Long-term growth of the Philippine economy 1902-1961," *The Philippine Economic Journal*, vol. VII, no. 3 (1968).

Maddison, Angus, *Monitoring the world economy 1820-1992*, Paris: .E.C.D., 1995.

Sicat, Gerardo P., "On the measurement of long-term output," *The Philippine Economic Journal*, vol. VII, no. 1 (first semester 1968), pp. 25-41.

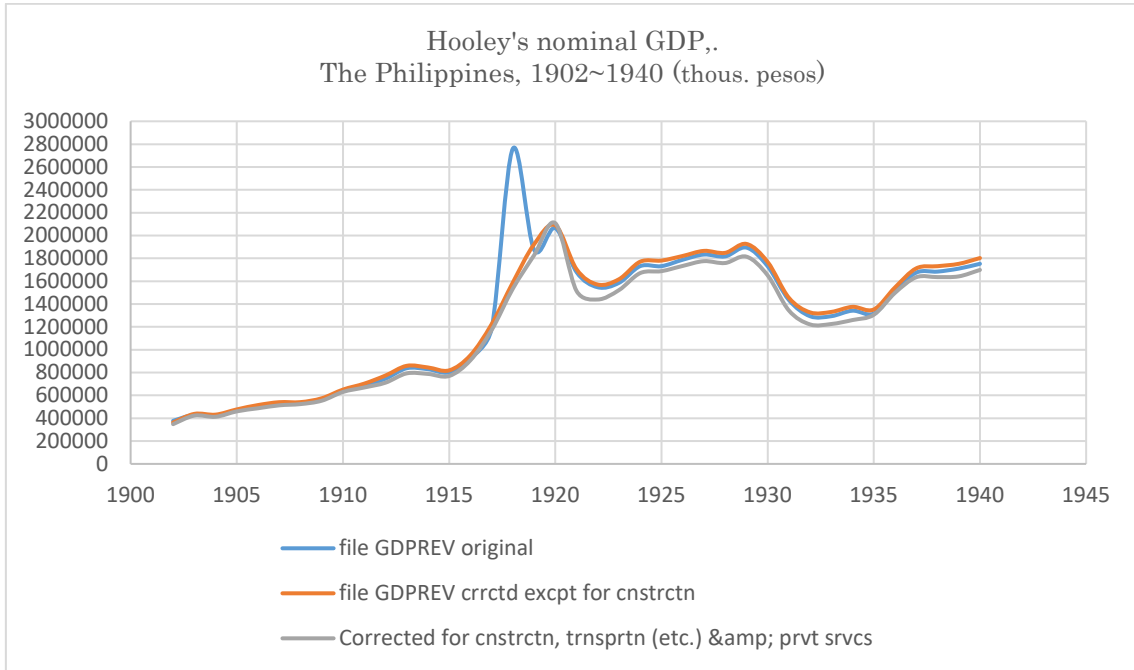
Umaña, Salvador C., "Growth of output of Philippine manufacturing: 1902-1960," *Economic Research Journal*, vol. 13, no. 3 (Dec. 1966), pp. 146-160.

Figure 1.



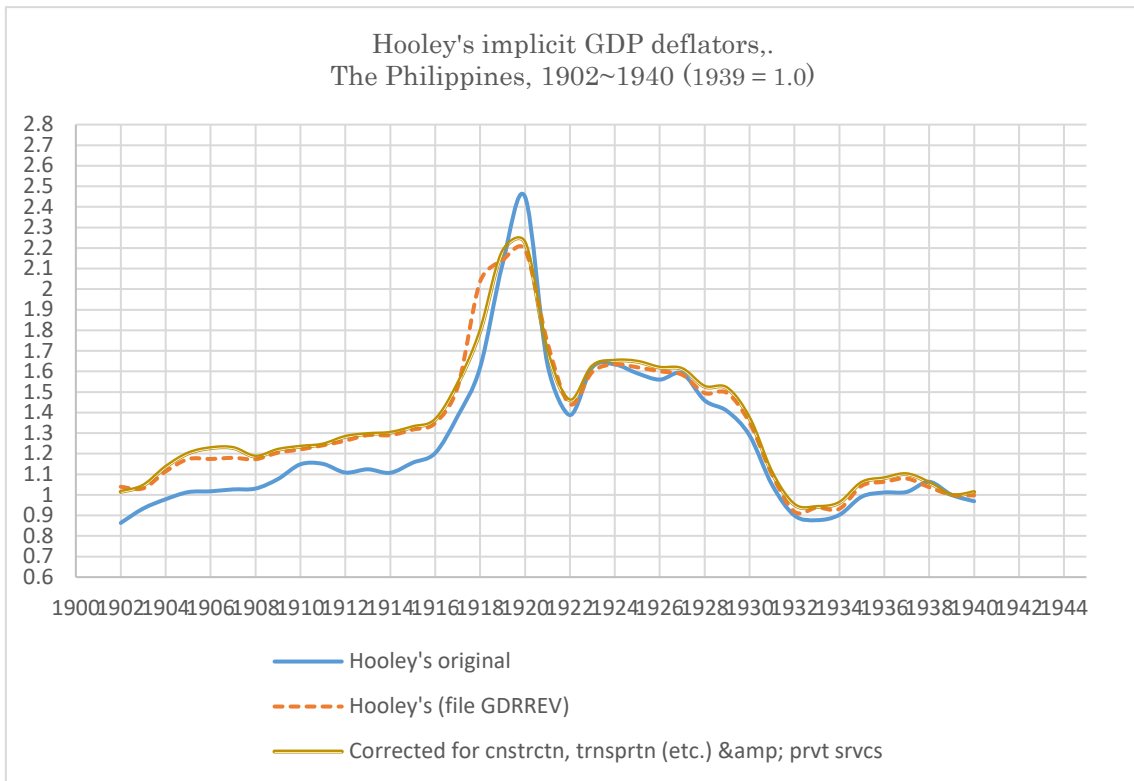
(Data Source) TwoGDPAdjstd.iv2023; file 39GDPAdjstd DN29.

Figure 2.



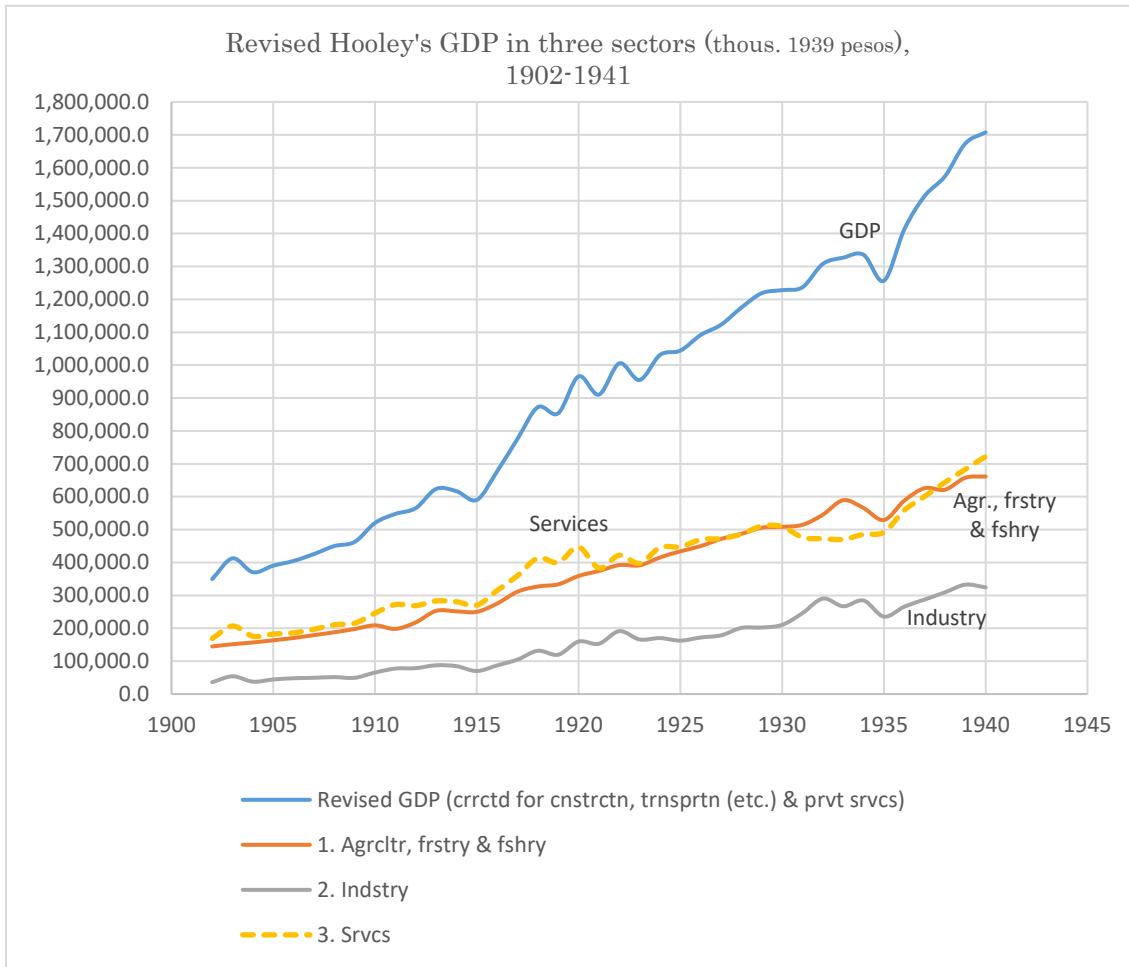
Data source) TwoGDPsAdjstd.iv2023, file NmlGDPAdjstd U71

Figure 3.



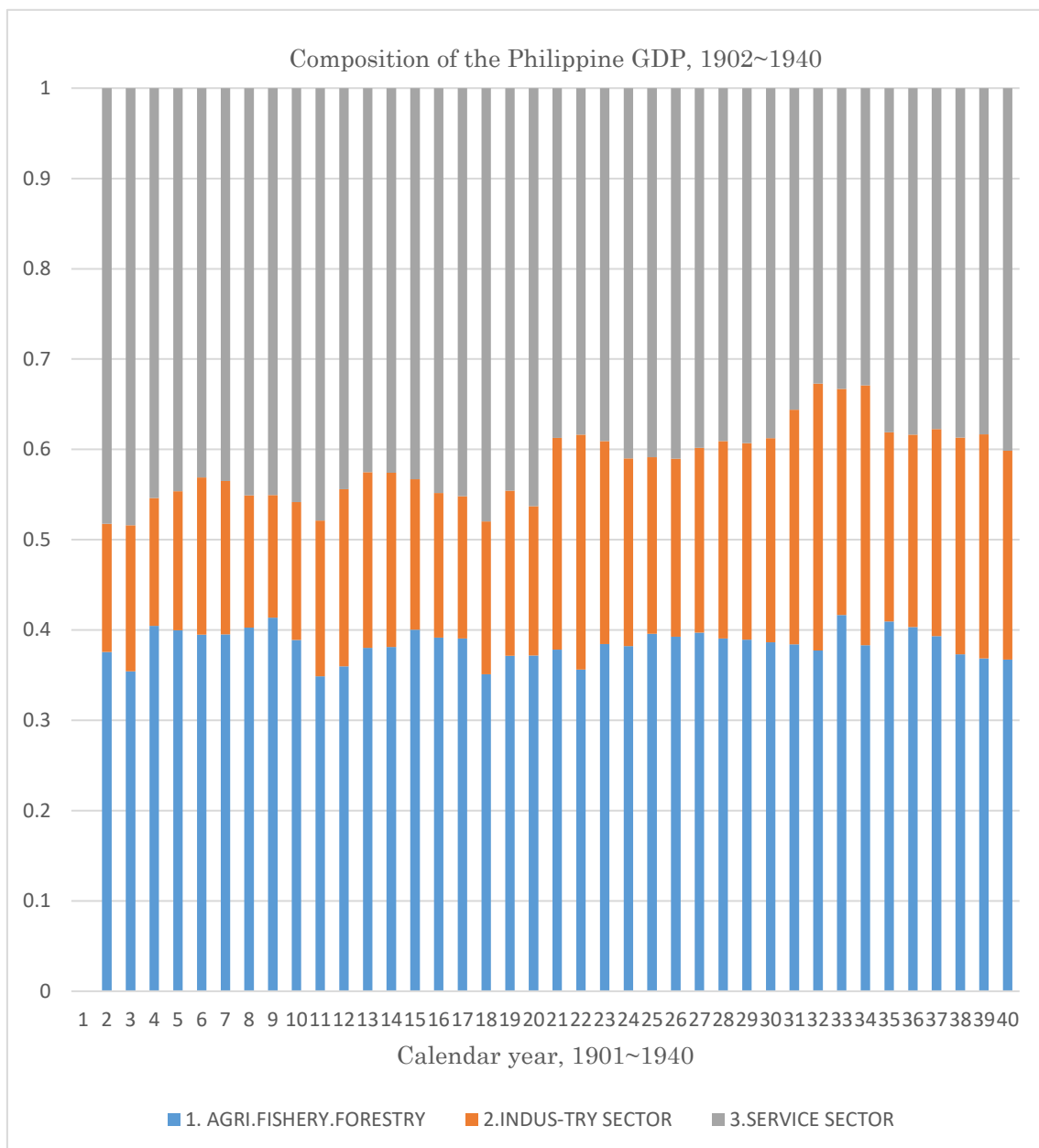
Data source) TwoGDPsAdjstd.iv2023, file Prices BE16

Figure 4.



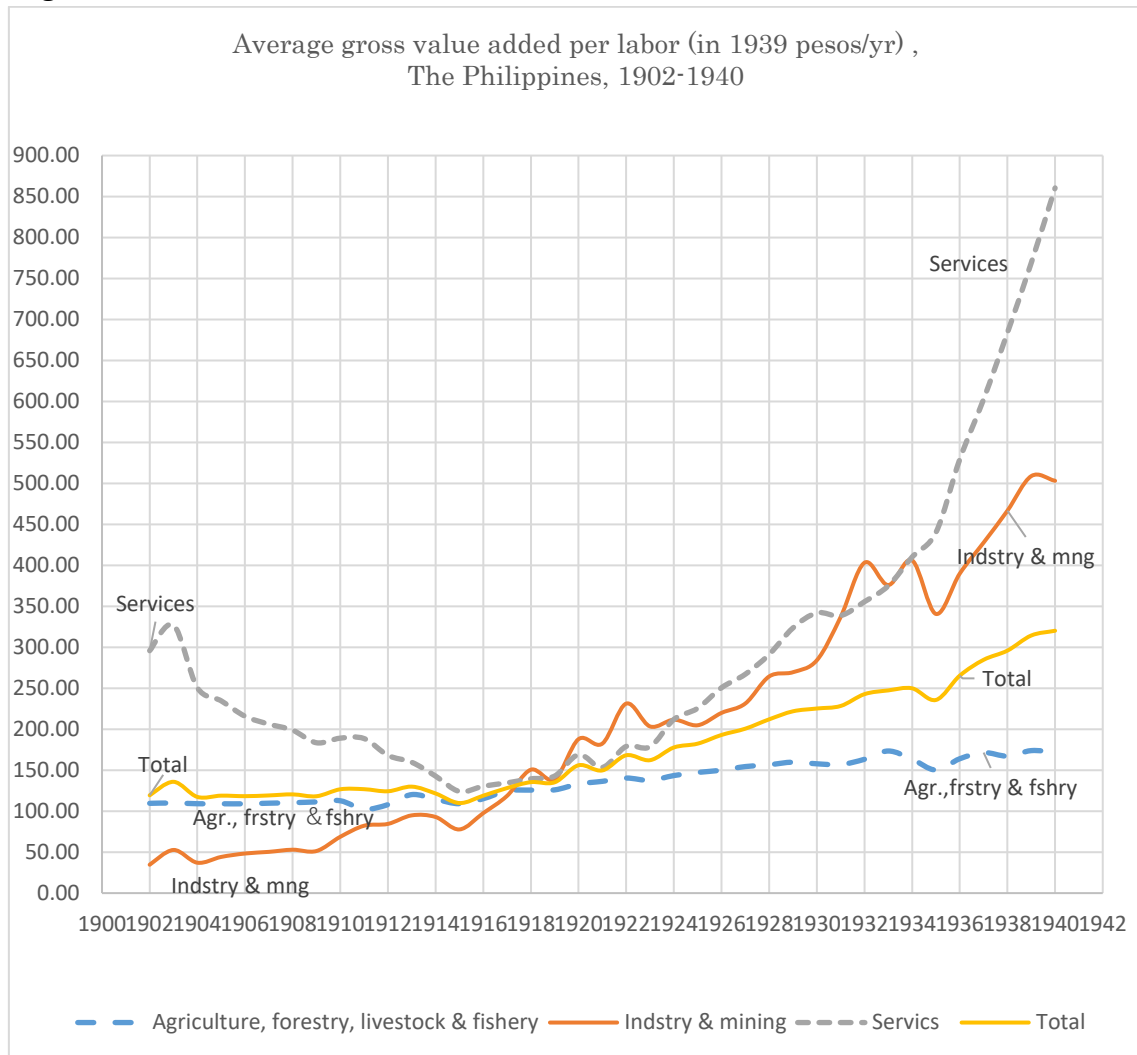
Data source) TwoGDPAdjstd.iv2023; file 39GDPAdjstd DN12.

Figure 5.



Data source) TwoGDPAdjsted.iv2023; file Cmpstn BL14.

Figure 6.



Data source) TwoGDPsAdjstd.iv2023; file Tmsrs F15.

Richard Hooley's GDP of the Philippines, 1902~1940, slightly revised (as of 12 June 2023)

Calendar year	Real GDP [thous. 1939 pesos]				Nominal GDP [thous. pesos]			
	1.	2.	3.	Total	1.	2.	3.	Total
	Agriculture, forestry, livestock & fishery	Indstry & mining	Services		Agriculture, forestry, livestock & fishery	Indstry & mining	Services	
1901								
1902	144,711	35,923	168,898	349,532	178,715	29,987	139,316	348,018
1903	151,509	54,053	207,019	412,581	206,775	46,328	169,924	423,027
1904	156,792	37,682	175,927	370,401	206,284	36,102	170,254	412,640
1905	163,503	44,363	182,484	390,350	226,337	42,475	191,274	460,086
1906	170,548	48,037	186,073	404,658	239,983	44,693	202,508	487,183
1907	179,129	49,494	197,068	425,690	256,829	48,824	207,227	512,881
1908	187,939	51,522	210,551	450,012	265,497	50,994	207,227	523,719
1909	197,763	49,442	215,399	462,604	284,244	53,961	215,119	553,323
1910	208,884	65,439	246,059	520,382	306,264	84,705	239,121	630,090
1911	198,152	77,470	272,043	547,666	300,726	92,504	275,797	669,027
1912	217,817	78,724	268,728	565,269	328,885	87,416	294,737	711,037
1913	253,052	87,499	283,007	623,557	347,887	114,001	330,796	792,683
1914	251,449	84,744	280,525	616,718	360,302	103,879	323,696	787,877
1915	249,983	70,147	270,194	590,323	370,065	87,153	312,717	769,935
1916	275,262	87,176	314,958	677,396	418,750	114,746	373,332	906,828
1917	311,260	104,836	359,861	775,957	539,165	153,943	478,102	1,171,210
1918	327,035	131,643	413,520	872,198	698,255	217,709	618,215	1,534,178
1919	333,645	119,743	400,124	853,513	893,397	270,683	662,577	1,826,657
1920	359,105	159,732	446,872	965,708	856,075	462,735	788,973	2,107,782
1921	374,310	153,007	382,978	910,295	608,240	282,963	623,621	1,514,824
1922	392,192	191,234	422,038	1,005,463	589,589	273,029	577,059	1,439,678
1923	391,322	165,878	397,457	954,656	686,781	278,206	556,988	1,521,974
1924	415,314	170,187	445,437	1,030,938	782,462	283,761	604,853	1,671,076
1925	433,976	162,499	447,723	1,044,198	807,761	264,253	615,848	1,687,862
1926	449,869	172,068	469,695	1,091,632	826,943	274,843	631,753	1,733,538
1927	471,586	178,553	472,663	1,122,802	842,326	300,949	632,166	1,775,440
1928	487,034	201,208	486,685	1,174,927	832,331	290,181	636,592	1,759,104
1929	505,785	202,345	510,560	1,218,690	870,598	289,910	654,276	1,814,783
1930	508,372	210,295	509,324	1,227,991	739,929	294,652	616,906	1,651,486
1931	514,555	245,976	476,292	1,236,823	538,384	271,860	533,428	1,343,672
1932	545,239	290,309	472,252	1,307,800	475,082	256,983	489,069	1,221,134
1933	589,347	266,945	470,271	1,326,562	513,395	230,820	480,769	1,224,984
1934	565,571	284,372	485,559	1,335,502	515,628	257,056	487,171	1,259,855
1935	529,098	235,337	492,015	1,256,450	550,550	254,130	501,382	1,306,062
1936	587,867	265,668	558,871	1,412,406	638,901	293,118	565,946	1,497,965
1937	625,911	287,395	600,746	1,514,052	682,741	327,988	623,956	1,634,686
1938	621,166	309,258	643,643	1,574,066	647,985	344,005	643,656	1,635,647
1939	657,673	332,585	683,469	1,673,727	657,673	332,585	651,761	1,642,019
1940	661,313	324,342	722,079	1,707,733	650,929	320,787	726,721	1,698,438

Data source) TwoGDPsAdjstd.iv2023; file Tmsrs P9.

Employment in thous. assuming the annual const. rates of growth:

	Primary	Secondary	Tertiary	Total						
1901										
1902	1320.82745	<i>log comptation</i>	1037.43544	<i>log comptation</i>	2929.25125 ←ass. the same rates backwards					
1903	1377.979	7.863766215	7.228373212	1026.379	6.773072366	6.933792353	632.918	7.994921646	6.45034087	3037.276
1904	1437.60346	0.042339534	1.043269502	1015.4404	-0.010714666	0.989342532	701.5645578	0.102972052	1.10846043	3154.60842
1905	1499.80785			1004.61837			777.6565506			3282.08278
1906	1564.70379			993.911686			862.0015136			3420.61699
1907	1632.40774			983.319104			955.4945676			3571.22141
1908	1703.04121			972.839412			1059.127918			3735.00854
1909	1776.73096			962.471407			1174.001386			3913.20375
1910	1853.60922			952.213898			1301.33408			4107.1572
1911	1933.81397			942.065709			1442.477333			4318.35701
1912	2017.48913			932.025674			1598.929043			4548.44385
1913	2104.78488			922.09264			1772.349573			4799.22709
1914	2195.85787			912.265467			1964.579368			5072.70271
1915	2290.87155			902.543026			2177.658489			5371.07307
1916	2389.99642			892.924203			2413.848263			5696.76889
1917	2493.41038			883.407892			2675.655281			6052.47355
1918	2601.29900	8.220205	7.863766	873.993000	6.496342	6.773072	2965.858000	6.847152469	7.99492165	6441.150
1919	2648.07474	0.017821927	1.017981685	861.983259	-0.013836518	0.986258767	2800.443809	-0.057388459	0.9442272	6310.50181
1920	2695.69158			850.138546			2644.25523			6190.08536
1921	2744.16466			838.456594			2496.777724			6079.39898
1922	2793.50937			826.935167			2357.525451			5977.96998
1923	2843.74137			815.572058			2226.039667			5885.3531
1924	2894.87663			804.365092			2101.887212			5801.12894
1925	2946.93139			793.312124			1984.659087			5724.9026
1926	2999.92218			782.411038			1873.969102			5656.30232
1927	3053.86584			771.659745			1769.452607			5594.97819
1928	3108.77949			761.056189			1670.765289			5540.60097
1929	3164.68058			750.598339			1577.582039			5492.86096
1930	3221.58687			740.284192			1489.595879			5451.46694
1931	3279.51643			730.111775			1406.516953			5416.14516
1932	3338.48766			720.079139			1328.071571			5386.63837
1933	3398.5193			710.184364			1254.001307			5362.70497
1934	3459.6304			700.425555			1184.062149			5344.1181
1935	3521.84039			690.800844			1118.023693			5330.66492
1936	3585.16901			681.308389			1055.668387			5322.14578
1937	3649.63639			671.946372			996.7908098			5318.37357
1938	3715.26300			662.713000			941.1970000			5319.17300
1939	3782.06969			653.606506			888.703812			5324.38001 ←ass. the same rates forwards
1940	3850.07767			644.625147			839.138317			5333.84114 ←ass. the same rates forwards