国民所得推計研究会資料(16)

[注意] この資料のうち,『長期経済統計』(東洋経済新報社)等に
公刊されたもの以外のもつを使用して公けにする ばあいには,
前以て原著者の了解を得ることが必要である。

資料番号	資料名	氏名
A-1	産業・規模・男女及び年令別 私工一人一日当り賃金（明治42年及び大正3年）	梅村・中村
①2	社史文献目録	江見
3	産業及び男女別私工一人一日当り賃金（大正8年～昭和3年）	梅村・中村
B-1	商業マージン率資料	山田（克）
2	有業人口（1872-1920）の推計（I）農業人口	大川
3	資本係数の諸推計	伊東
4	戦后消費支出の推計（その一）電信電話郵便交通費	野田
5	法人在庫の推計について（No.1）	倉林
②6	戦后貨物運賃の推計（その一）	赤坂
7	有業人口（1872-1920）の推計（II）運業，商業，工業人口	大川
8	戦后設備投資の推計（その一）	篠原
9	法人在庫の推計について（No.2）	倉林
10	1952-1955商業統計による消費支出の推計（被服履物飲食費）	赤坂
11	小売評価法による戦后に関する消費推計	野田
12	戦前建設統計資料集（その一）	江見
13	戦前生計費指数の第一次試算（1892-1922）	山田（三）
③14	綿糸紡績業に於る資本蓄積（1886-1957）	川島
15	両大戦間GNPデフレーター試算	川勝
16	コモディティ・フロー法による戦后建設投資・設備投資の推計（その二）	篠原
17	両大戦間GNE系列の海外経常余剰実質化因子試算	川勝
18	両大戦間生計費指数（東京）試算・資料集	安藤
④19	25-30年度生産国民所得の改訂と総生産の推計（I）農業	川上
20	全　上 （II）水産業	川上
21	25-30暦年生産国民所得と総生産の推計,改訂（VI）製造業	先崎
22	30-31年の生産所得と総生産額 IV鉱業 V建設業 VII公益事業	先崎
23	両大戦間の投資財デフレーターについて（第一次試算）	先崎
24	両大戦間生計費（東京）指数試算・資料集（改算）	安藤
25	戦前貿易指数（総括編）	山田（克）
26	明治31年～大正8年 男女・年令各才別人口の推計	赤坂
⑤27	国民貯蓄の推計（総括S2）	江見
28	コモディティ・フロー法による非耐久財消費支出の推計（その一）	篠原
	一工業統計表を中心とした輸出入推定、マージン運賃の調整過程一	

資料番号	資料名	氏名
B-29	コモディティ・フロー法による非耐久財消費支出の推計（その二）	篠原
	一「食料バランス・シート」による追加、商社委託加工生産，雑貨額出荷額の補正	
⑥30	第I部 貨幣の流通速度の推計（付.当座預金払元高と国民所得の比較）（戦前編）	伊東
31	第II部　全　上　（　全　上　）（戦后編）	伊東
32	民間貯蓄の推計　―金融統計からの接近―	江見
33	「日本の資本形成」の推計　―構成要素別―	江見
34	国民総生産の長期推計（昭和1年-32年）	川上外
	（参考）戦前の国民総支出（大正15年―昭和4年，第一次試算）	
⑦	（　〃　）昭和15年度より昭和19年度に至る国民所得推計	
	（　〃　）昭和14年度より昭和17年度に至る賃金統計	
35	財政支出の推計方法について（予備的覚え書）	塩野谷
36	明治初期から第二次大戦迄の週算生計費指数（1879年～1938年）	山田（三）
37	戦前貿易指数（品目編）	山田（克）
38	鉱工業雇用関係資料とその推計	佐野
⑧39	昭和5年-19年勤労所得の推計（製造業）	川上
40	Capital Formation in Postwar Japan	篠原
41	The pattern of Japanese Long-Term Economic Growth	大川
42	ノールウェイにおける国民所得計算の方法と問題	倉林
C-1	明治31年～大正8年 男女・年令各才別人口の推計 （改算結果）	赤坂
2	金融機関関係基礎資料 第I部 銀行編 1900-1940	伊東
⑨	―資本金・貸出・有価証券・預金・資産総額附録 1930-1959―	
3A	労力人口及び就業者 1950-1958	梅村
	―季節調整系列、趨勢値、循環変動指数―	
3BC	労力力率、産業及び従業上の地位別就業者	梅村
	―季節調整系列、趨勢値、循環変動指数―	
4	農村生活水準の測定	
5	昭和2-5年農家経済調査個票再集計結果表	山田（三）
⑩6	日本勧業銀行、農工銀行,拓殖銀行産業別貸出額	藤野・H.鳩
7	コモディティ・フロー法による1914-1936年 資本形成 第一次推計資料	篠原
8	農商務統計表による産業別動力	梅村・南
9	農家戸数 修正推計 1880～1940	山田（三）

資料番号	資料名	氏名
C-10	明治7年製造素生産額	梅村
⑪11	農商務統計表による賃工数・賃金	梅村
12	昭和5年ム勢調査による府県・男女・年令階級別就業率	赤坂
13	大正9年 仝上	赤坂
14	府県統計表による工業生産の推計 I 明治22-24年	梅村
⑫15	製造業従業者数の推計 1919-1942年	赤坂
16	林業産出高の推計 1879-1958年	熊崎
17	水産本業従業者数の推計 1872-1940年	赤坂
18	男女年令別人口の推計 1872-1898, 学令児童 就学不就学 1878-1900年	赤坂
19	製造業従業者数の推計 1899-1918	赤坂
D-1	1881~1938 綿糸紡績業における固定設備の推計 (付 図表)	藤野
2	農業資本の推計	山田(3)
⑬3	車業労務者の賃金と小売物価指数の推計 1716~1958	梅村
4	1909-1940年間における食料消費支出の推計 I 推計過程の説明	篠原
5	仝上 II 統計編 (その1)	仝上
6	仝上 III 統計編 (その2)	仝上
7	財政収支の推計 —中央政府編I— 1915. 1920. 1925. 1930. 1935.	塩野谷
8	仝上 —中央政府編II— 仝上	仝上
⑭9	製造業従業者数の推計 —明治42年~昭和17年	佐野
10	An Approach To The Measurement of National Saving in Japan. (1878~1940)	江見
11	第1回 個別推計の総合化	大川・赤坂
12	農家戸数の推計 (1880~1940年)	山田(二)
⑮13	1877-1940 貨幣量・マーシャルk・預金回転率の推計 I	藤野
14	仝上 II	仝上
15	綿紡績兼営綿織物生産額の推計 1898~1938	仝上
16	1900-1940 男女・年令別 就労者数の推計	赤坂
⑯17	肥料の生産・消費推計 (1889-1941, 1951-1959)	速水
⑱18	明治以降 財政収支の推計 1868-1929	江見・高松
19	電気事業の所得推計 (1887~1941)	南
20	Interim Report on Estimation of Long-Run Capital Stock Series in prewar Japan	石渡
21	第2回 個別推計の総合化	大川・赤坂
22	電気料金指数の推計 (1907-1960) 試算	南

資料番号	資料名	氏名
D-23	私鉄生産所得の推計 (1882-1960)	南
24	ム鉄生産所得の推計 (1872-1960)	仝上
⑯25	耕地面積の推計 (1883-1944)	速水,山田(三)
⑰26	農業流動資本投下量の推計	速水
27	戦前の日本における資本ストックの推計 (1868-1940)	石渡
28	明治期に於ける流通段階別・地域別物価差	野田
⑱29	農業生産額の推計 (1874-1961)	山田(三)
30	戦前鉄道ストックの推計 国鉄編 (1870~1936)	熊崎
⑲31	民間建築投資の推計 その1 住宅,商業	江見・石
㉒32	製糸業における所得・所得率及労働の相対的分け前 1893~1942	小野
33	民間建築投資の推計 その2 工業	江見・石
E-1	イギリスの実質国民所得推計における生産物法 (Production Method) の適用について	宇藤 洋 大蔵省大臣官房調査課
-2	昭和18年 ム家資金計画に用いる参考資料	水産庁調査研究室所調査資料
-3	昭和21-33年 漁業投資額の推計試算 (水産調査月報 No.55)	H.大島
-4	Preliminary Summary Tables Functional Classification of Meiji Central Government Expenditures by Economic Type.	H.大島
⑳-5	Capital Accumulation and Economic Growth	カルドア
-6	Preliminary Summary Table : Functional Classification of Choson table for all Prefectures (for meiji 13, 22, 33 and 43 nen).	H.大島
-7	昭和5-19年 生産ム民所得推計の検討	企画庁経済研究所検討用資料
-8	明治以降 内地農産物輸出入額 (台湾・朝鮮移出入額調整済)	野田
-9	本邦生産数量指数 (1921~25年=100) 1868~1936	名古屋高商

コクヨ 62 (35×32)

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INTERIM REPORT

ON

ESTIMATION OF LONG-RUN CAPITAL STOCK SERIES

IN PRE-WAR JAPAN

September 28, 1962

Shigeru Ishiwata

CONTENTS

Introduction

This paper is a part of the preliminary work for the estimation of long-run capital stock series in pre-war Japan which has been undertaken under the supervision of Professor Ohkawa and the leadership of Mr. Massaki. The main purpose of this work is, as I understand, to obtain an outline of capital stock in the long-run. As our research goes on, we have realised that we are apt to get into the forest to see only a tree or two without observing the forest as a whole. So this work would be worth while to be attempted as a preliminary one, though it mainly consists of routine works to put figures in a column into a row.

In spite of this preliminary character, it has not completely been finished yet. At the beginning of this study we decided to adopt the so-called "benchmark year method" and to take 1930 as our benchmark year, for the National Wealth Survey for 1930 (NW30) is the latest one which gives us its method and scope rather in detail in the pre-war period, though it is generally said that the benchmark year should be a "normal" one from political and economic points of view. But we found, that Producers' Durable Equipment (PDE) and Public Works such as Road and Bridge, Harbor and Riparian must be completly revised for making NW30 more suitable for our estimation, and P I Method has been adopted for that purpose.

In the following chapters some discussions will be made on the method of estimation for each item above. Excluded items in this report are Buildings, Railways, Water Works and Electricity and Gas Supply (Its machinery is included in PDE) in the classification of the national wealth survey. Consumers' holdings of durable commodities, works of art and other collectors' item and foreign balance in the national wealth data have been excluded from our estimation, for our concern is only for reproducible tangible assets directly or indirectly related to production.

Figure I : Net Capital Stock(Producers' Durable
Equipment-A and B Series- and Ships)

Million Yen

A Series —·—·—
B Series ————
Ships   ------
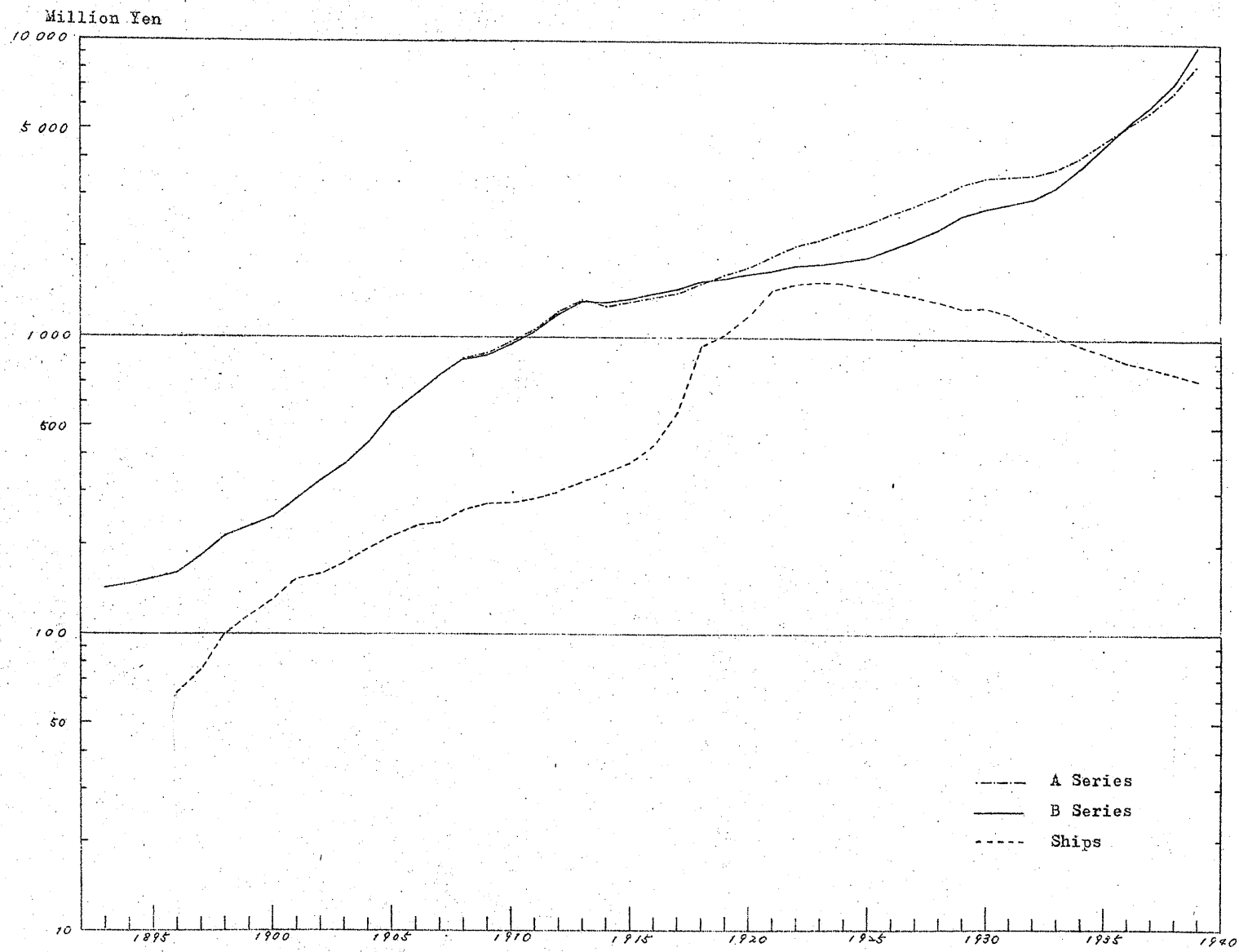
Figure II : Gross Capital Stock(Producers' Durable Equipment -A and B Series- and Ships)

Million Yen

A Series
B Series
Ships
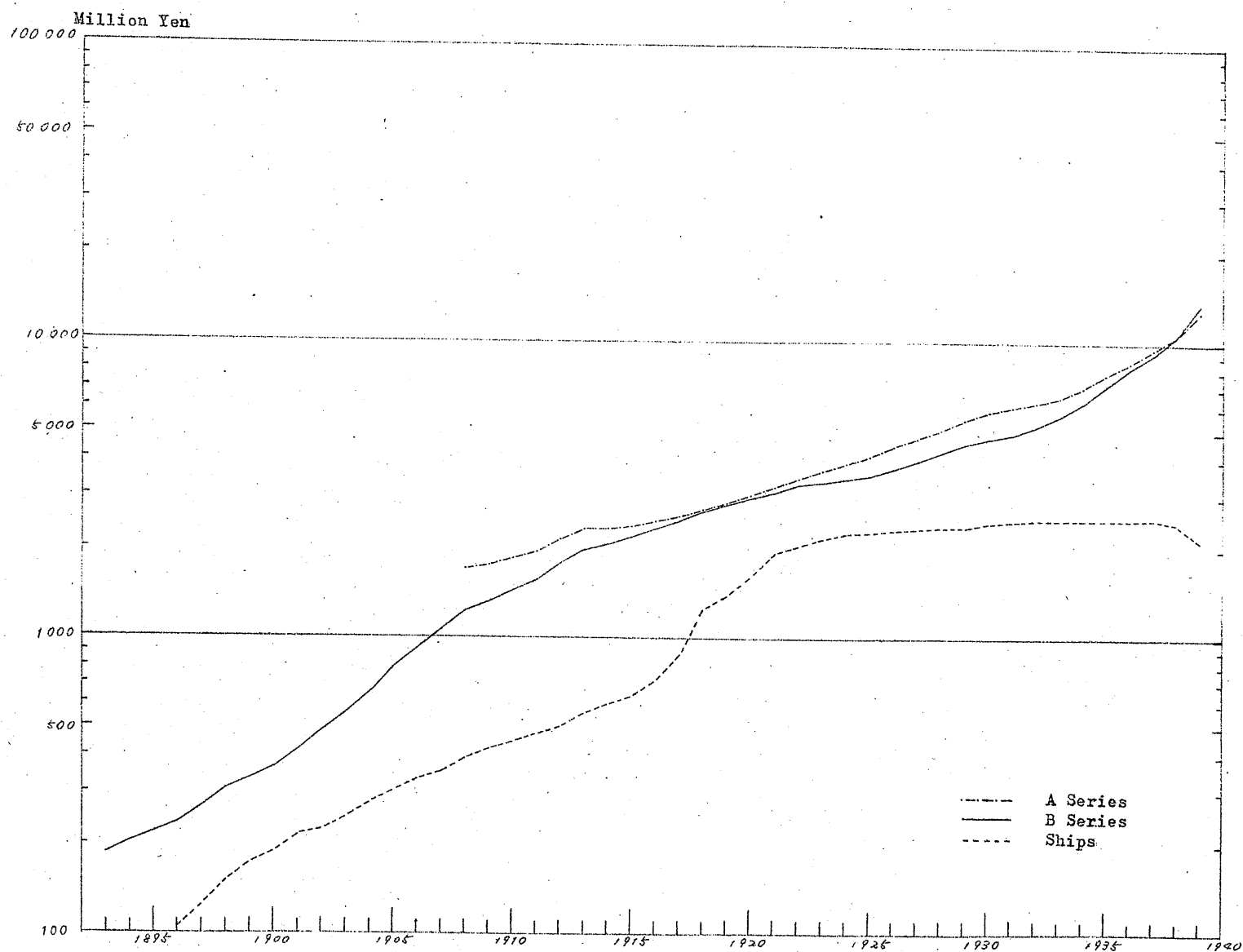
Figure III : Gross and Net Capital Stock(Producers' Durable
Equipment -A and B Series-)

Million Yen

- v -
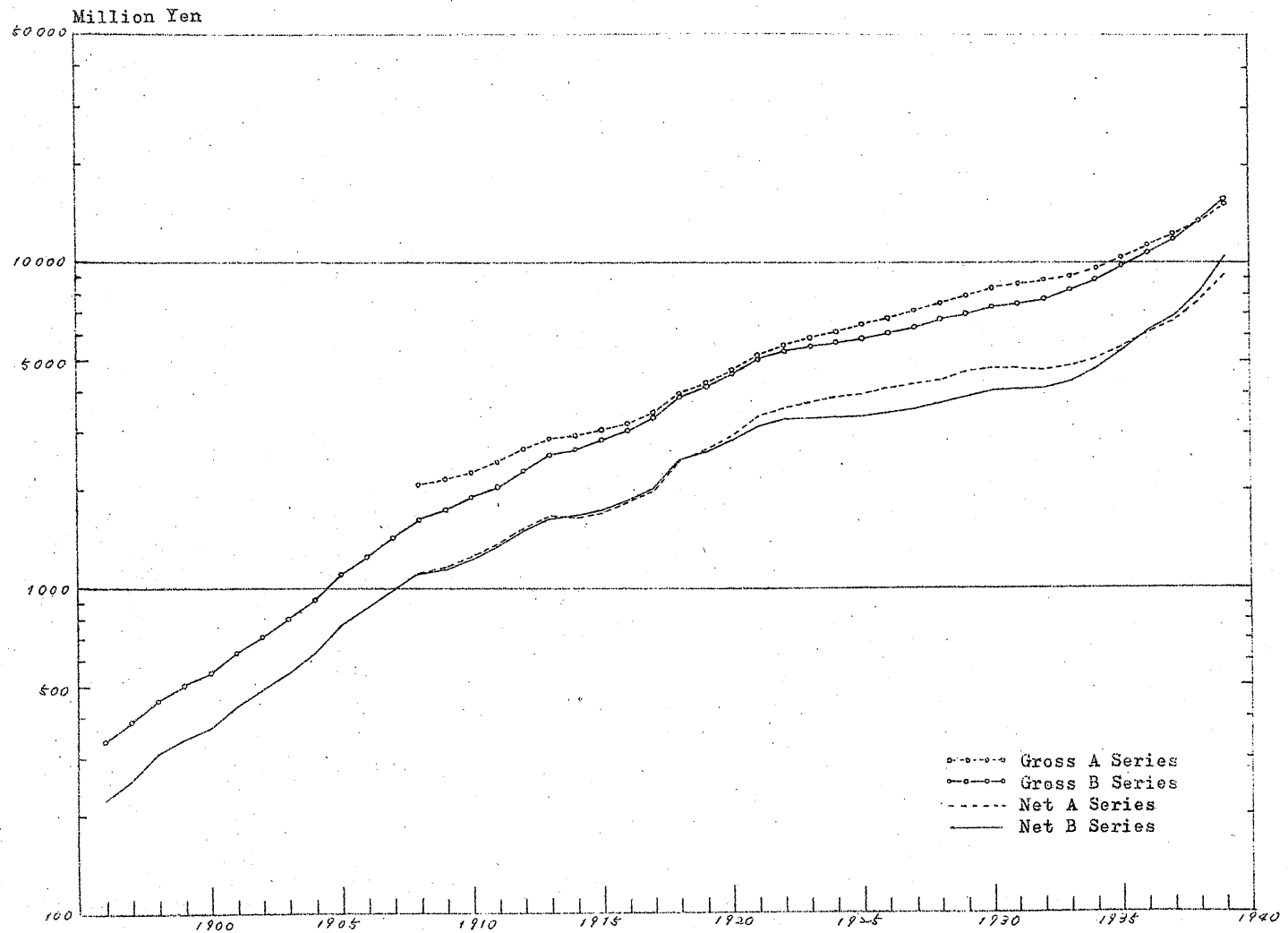
Figure IV : Net Capital Stock by Items
(Producers' Durable Equipment)

Million Yen

Legend:
o--o--o--o Total
———————— Machinery & Equipment
-------- Rolling Stock
o—o—o—o Tools & Instruments
—·—·—·— Automobile & Other Vehicles
×—×—×—× Repairs
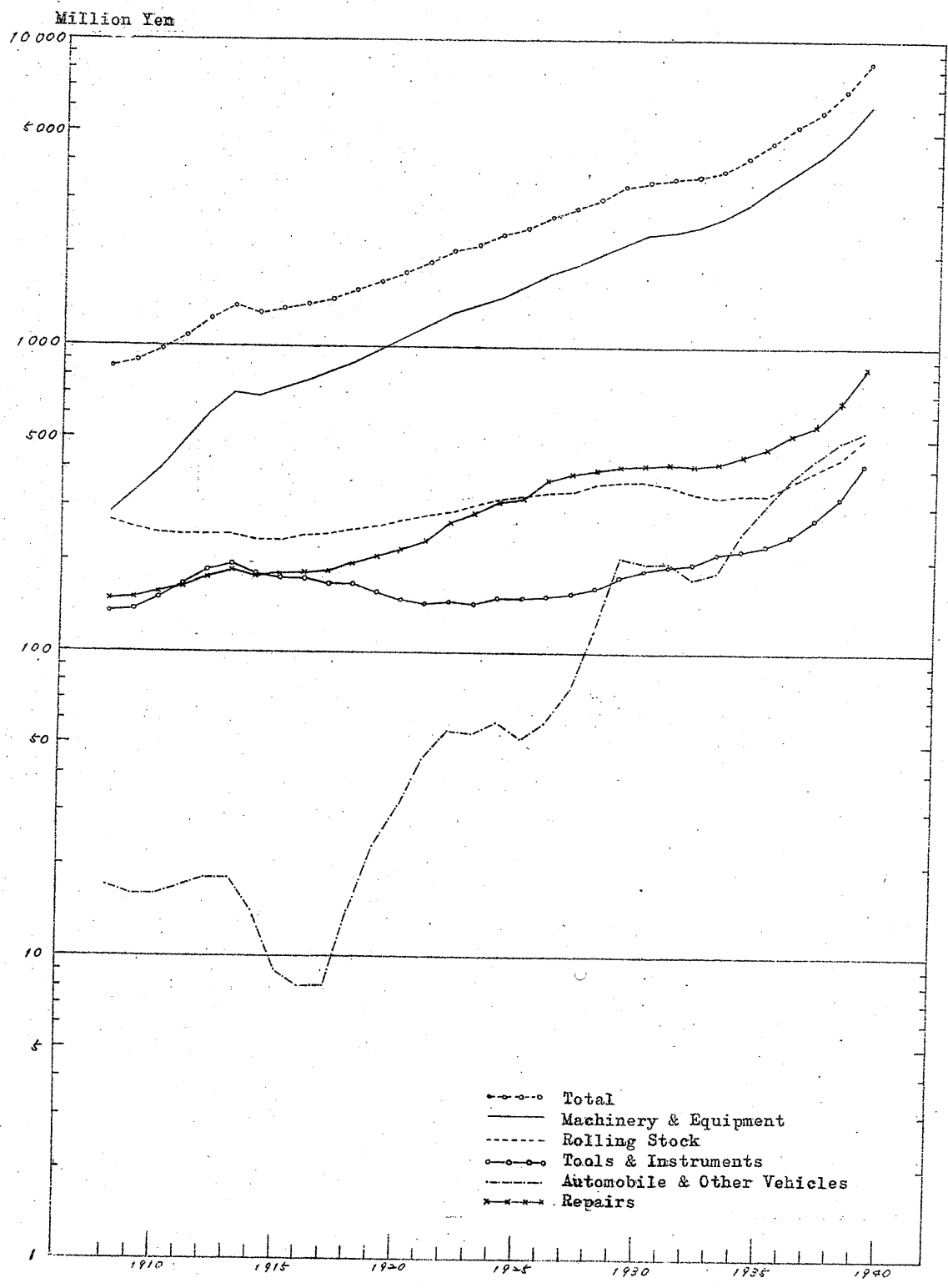
Figure V : Net Capital Stock by Items(Public Works)

Million Yen

Road & Bridge
Harbor
Riparian
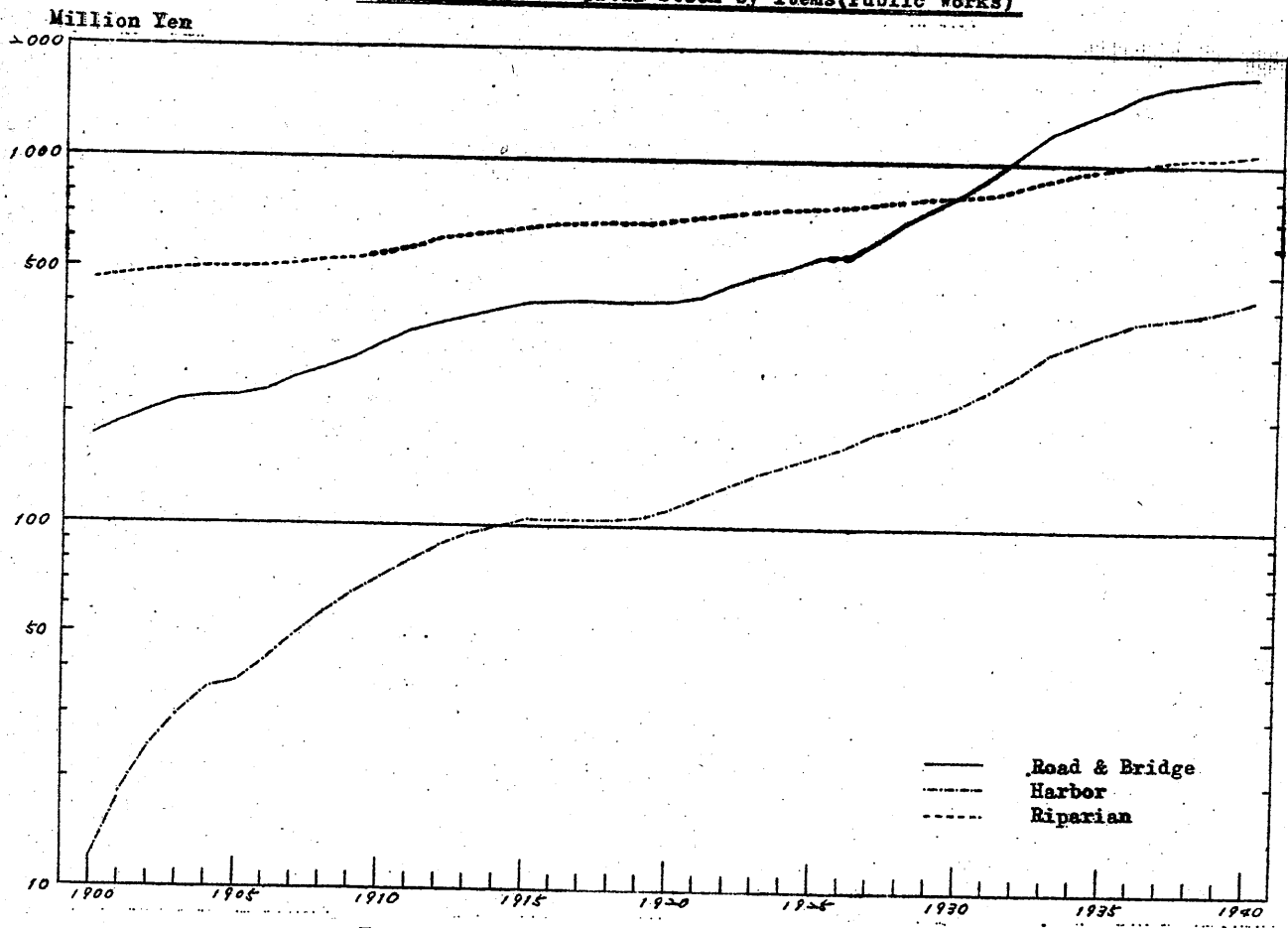
Figure VI : Gross Capital Stock by Items(Public Works)

Million Yen

Road & Bridge
Harbor
Riparian

Figure VII : Gross and Net Capital Stock(Public Works)

Million Yen

Figure VII : Gross and Net Capital Stock(Public Works)
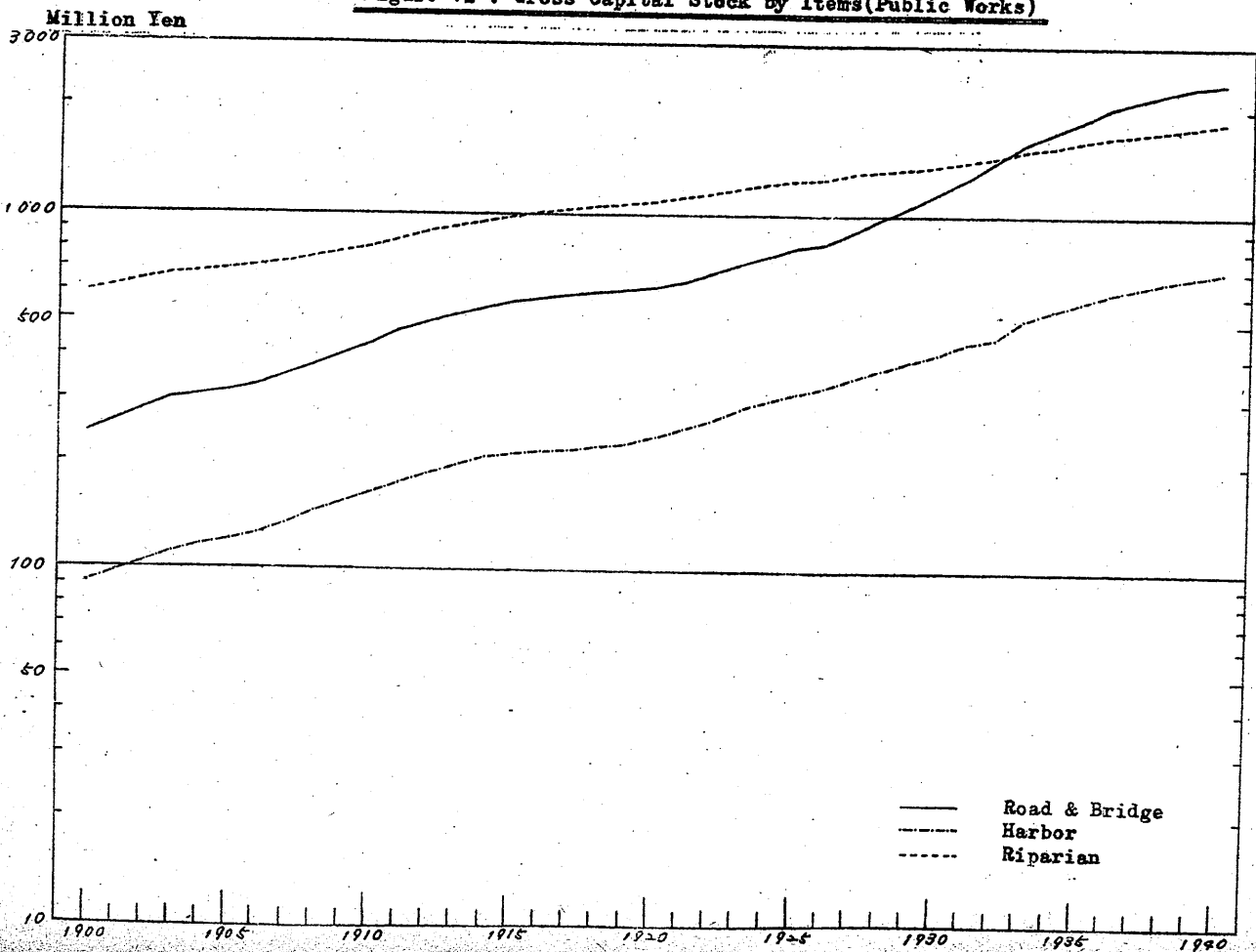
- - - - - Gross Capital Stock
——— Net Capital Stock
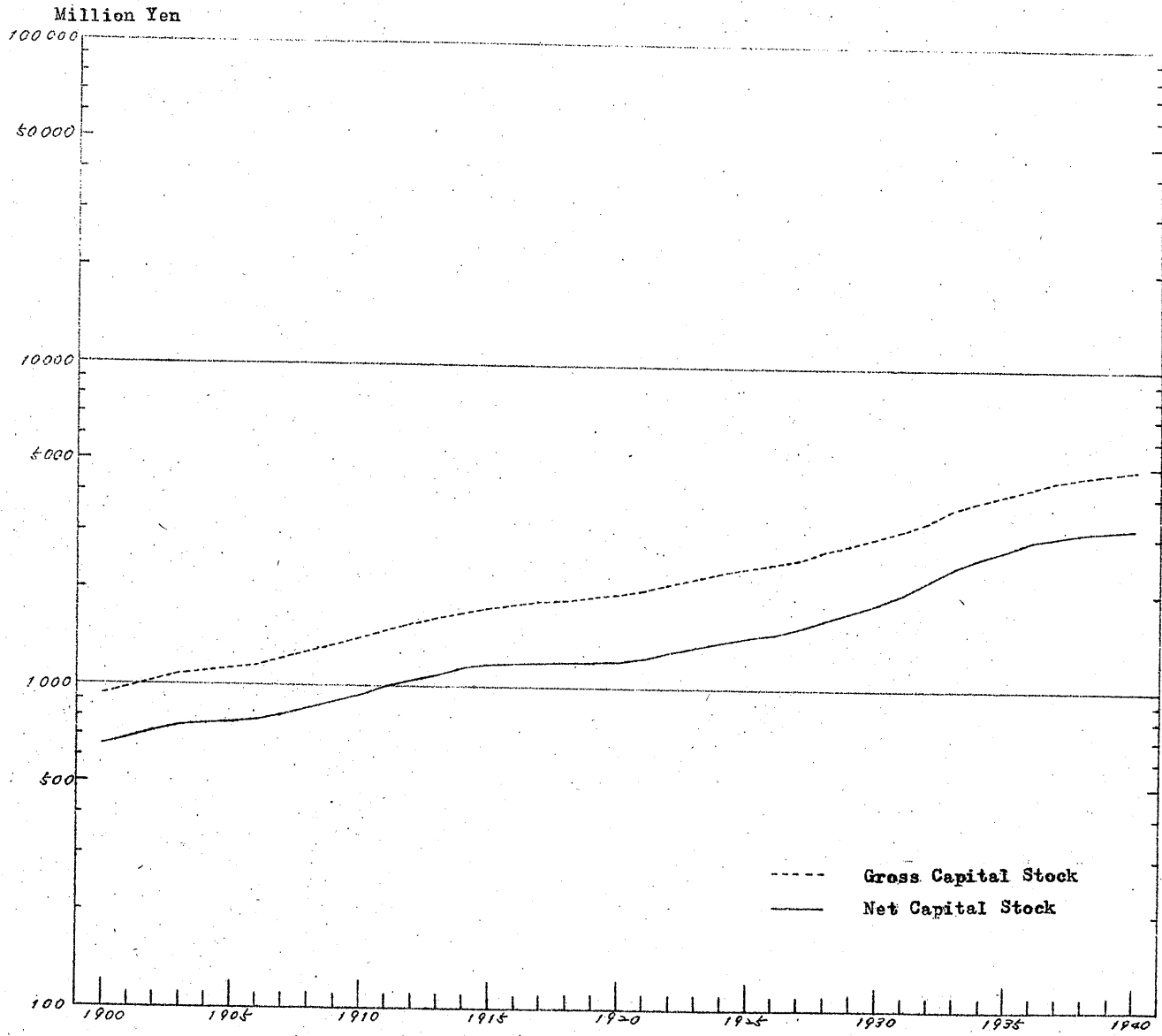
Figure VIII : Comparison between Koide Production Index
and GRJE's RNNP

(1914 = 100)

GRJE, Second Ind.,RNNP
Koide's Second Ind., Production Index
Koide's Machinery & Tools Ind., " "
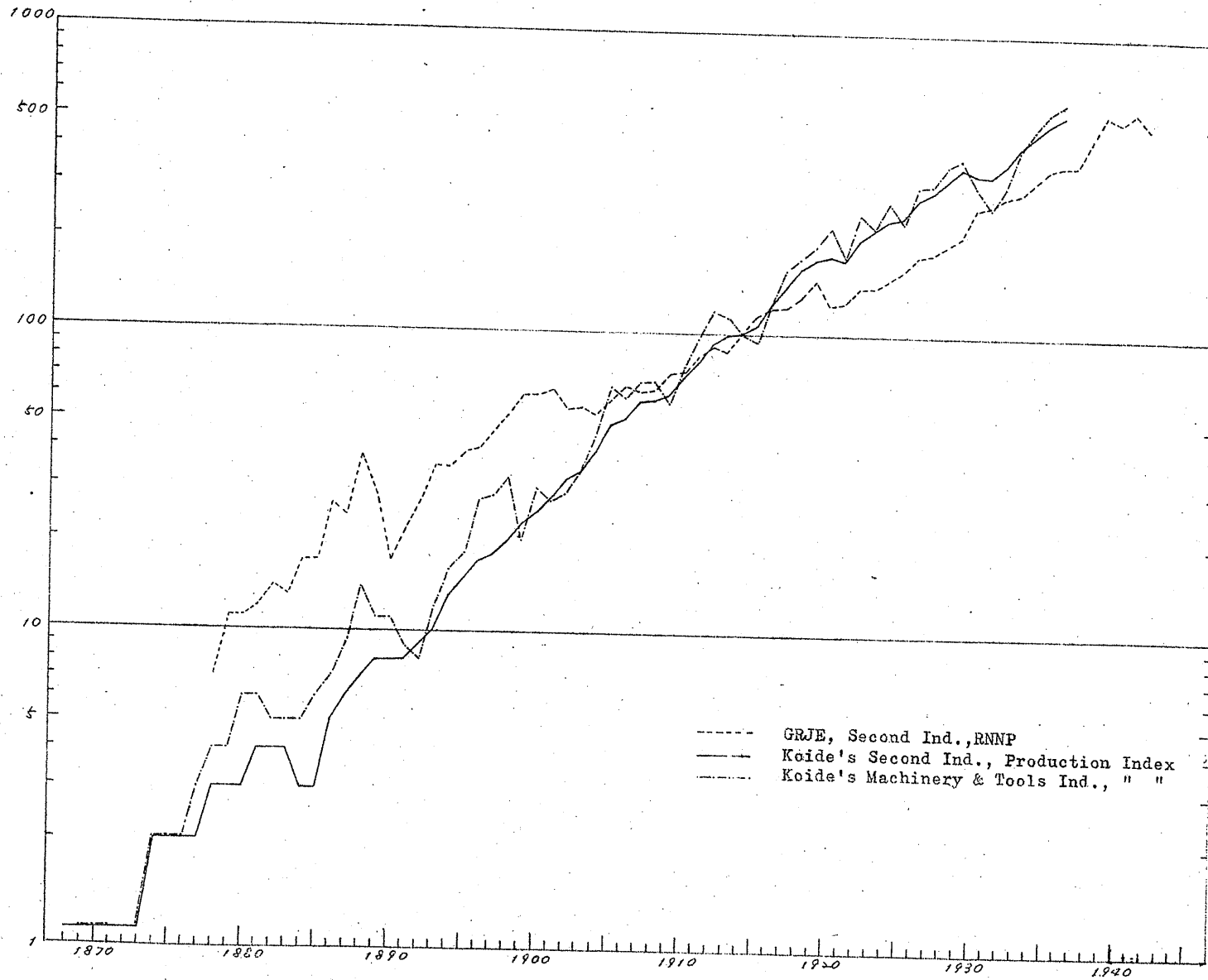
Figure IX : Estimates of Domestic Production of Producers' Durable Equipment

Million Yen

Legend:
- —— Rosovsky's series
- —·—·— 1930 base series
- - - - - Our series
- × Kōjō tōkeihyō figures (GRJE's non-agr. deflator)
- ○ Kōjō tōkeihyō figures (NW55 inflators)
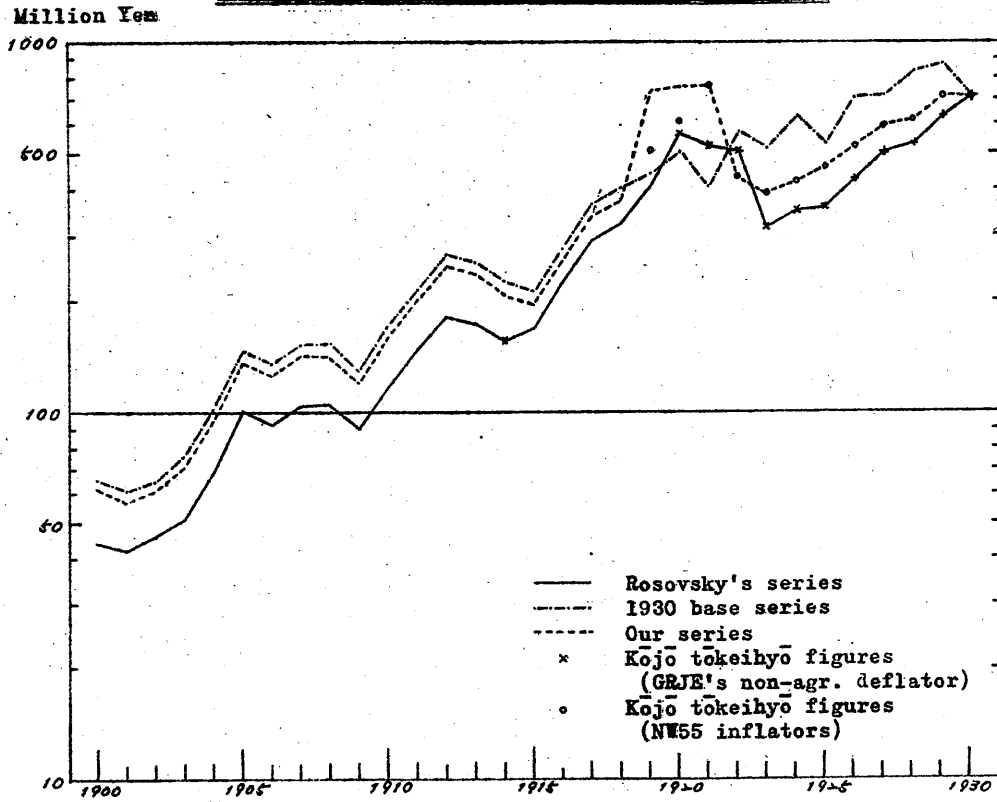
Figure X : Domestic Production of Ships (Nihon Teikoku Tōkeinenkan and Kōjō Tōkeihyō)

Thousand Gross Ton   **Million Yen**

Legend:
- - - - - - Kōjō tōkeihyō (1930 price)
- —·—·— Total tannage (NTT)
- —— Steam vessel (NTT)
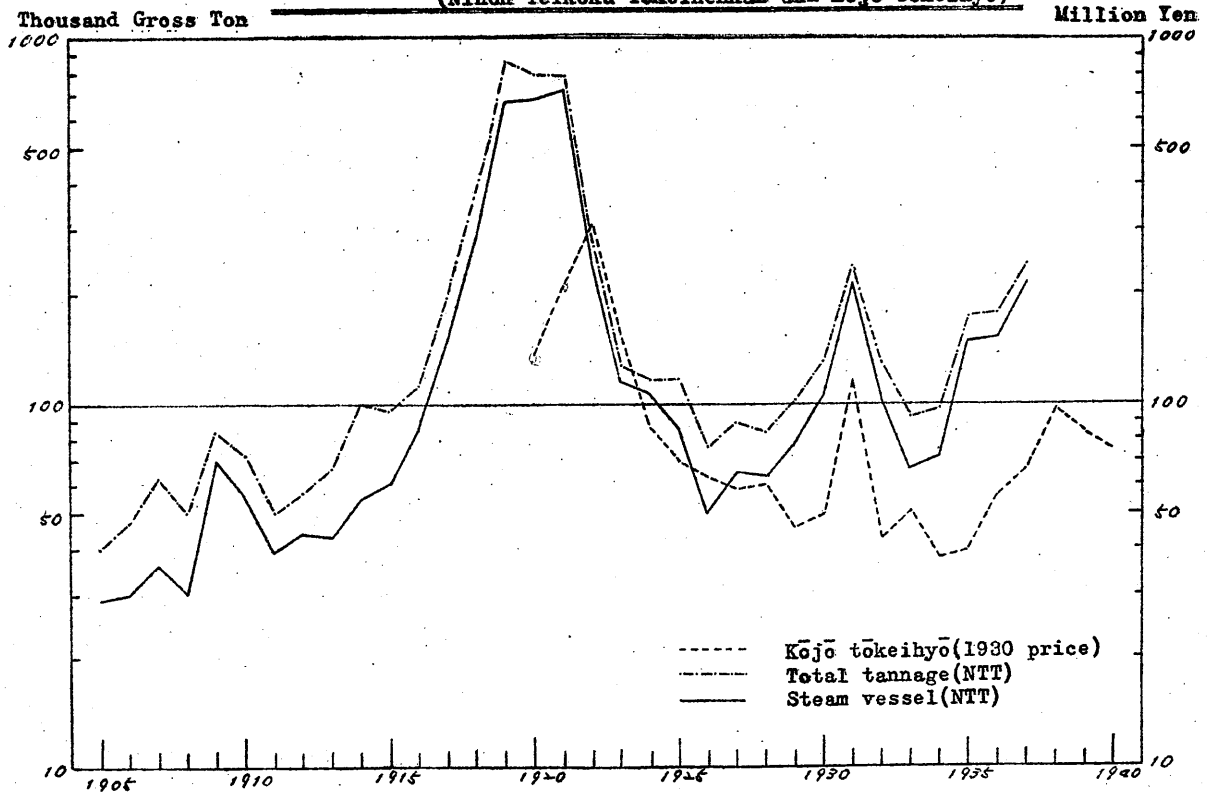
Figure XI : Domestic Production of Ships(Nation Wide and Mitsubishi
Nagasaki and Kawasaki Shipbuilding Companies)

Thousand Gross Ton

------ Nation Wide

——— Mitsubishi Nagasaki
         and Kawasaki

Table I   Net Capital Stock by Items (Producers' Durable   Unit: ¥ 1,000,000
Equipment –A Series–)   1930 Price

Year	Machinery & Equipment	Rolling Stock	Tools & Instruments	Automobile & Other Vehicles	Repairs	Total
1939	6,206	507	412	529	854	8,508
38	4,983	436	321	497	663	6,900
37	4,227	399	274	433	557	5,890
36	3,780	362	241	372	518	5,273
35	3,343	332	225	305	469	4,674
34	2,932	330	216	246	442	4,166
33	2,655	324	211	183	417	3,790
32	2,478	335	197	177	408	3,595
31	2,388	353	192	199	415	3,547
1930	2,326	365	186	198	410	3,485
29	2,188	364	178	204	405	3,339
28	2,014	352	162	119	397	3,044
27	1,873	335	156	76	383	2,823
26	1,745	333	152	59	366	2,655
25	1,607	326	150	52	319	2,454
24	1,475	319	150	59	310	2,313
23	1,369	303	144	54	283	2,153
22	1,295	289	147	55	265	2,051
21	1,190	281	144	45	231	1,891
1920	1,076	271	149	31	217	1,744
19	981	260	157	23	205	1,626
18	896	251	167	14	194	1,522
17	823	242	168	8	183	1,424
16	776	241	173	8	181	1,379
15	725	232	176	9	179	1,321
14	686	234	180	14	178	1,292
13	705	242	193	18	183	1,341
12	601	243	185	18	176	1,223
11	491	241	167	17	164	1,080
1910	397	244	150	16	155	967
09	336	253	138	16	150	893
08	286	268	134	17	149	854

Table II   Gross Capital Stock by Items(Producers' Durable
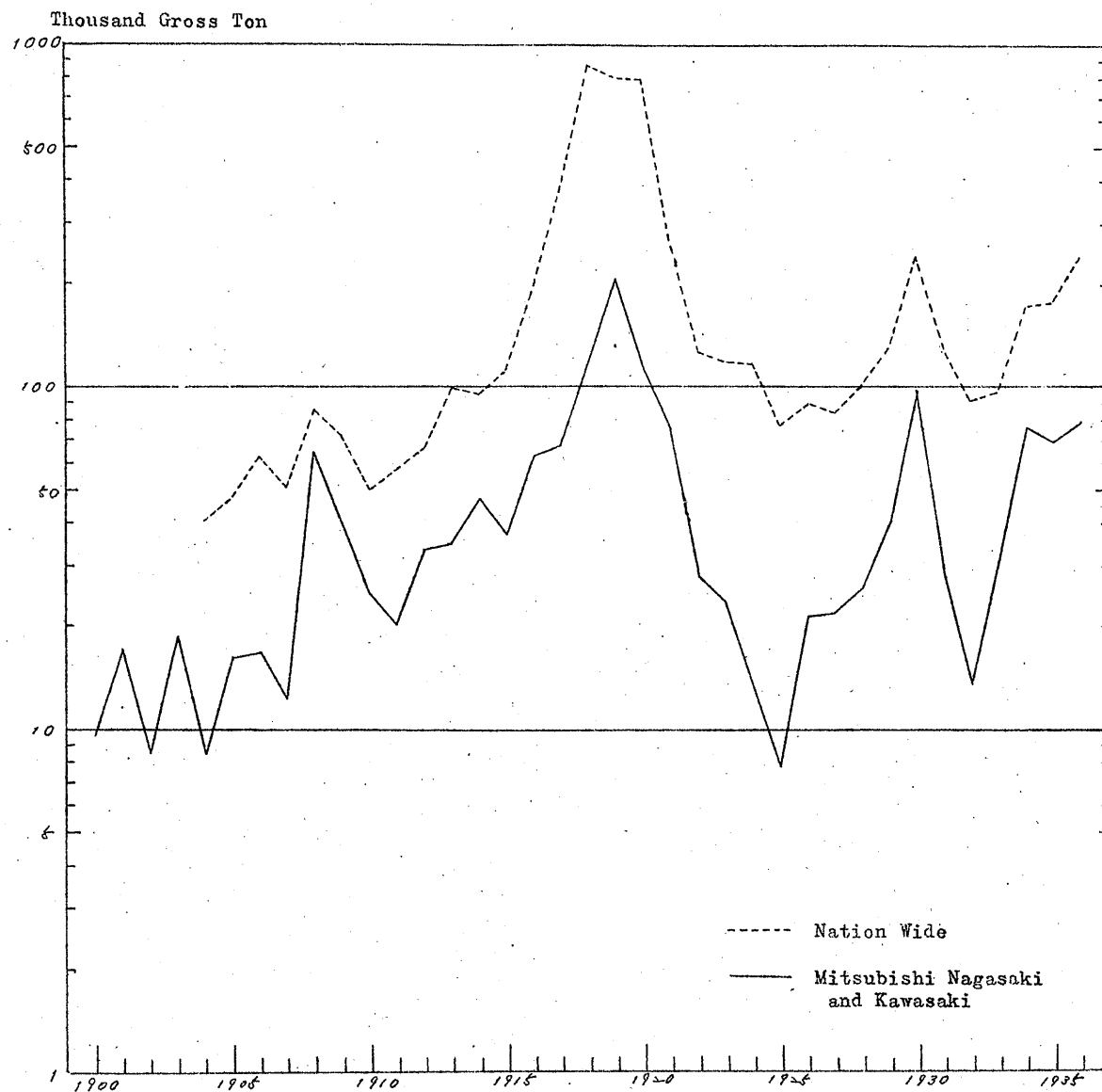
Equipment –A Series–)

Unit: ¥=1,000,000

1930 Price

Year	Machinery & Equipment	Rolling Stock	Tools & Instruments	Automobile & Other Vehicles	Repairs	Total
1939	8,859	889	673	1,086	1,503	13,010
38	7,402	809	561	938	1,268	10,978
37	6,429	756	502	798	1,156	9,641
36	5,799	704	453	670	1,083	8,709
35	5,193	658	421	620	997	7,889
34	4,583	637	397	540	953	7,110
33	4,247	621	386	443	904	6,601
32	4,022	624	366	399	884	6,295
31	3,868	629	357	371	860	6,085
1930	3,709	621	347	336	822	5,835
29	3,480	606	328	305	784	5,503
28	3,220	581	324	207	746	5,078
27	3,000	552	338	159	697	4,746
26	2,799	537	349	135	621	4,441
25	2,593	517	355	121	578	4,164
24	2,399	497	360	120	541	3,917
23	2,236	468	359	103	501	3,667
22	2,110	442	368	90	478	3,488
21	1,955	422	372	69	438	3,256
1920	1,795	400	384	48	414	3,041
19	1,660	378	399	40	389	2,866
18	1,538	357	416	34	367	2,712
17	1,433	337	425	30	344	2,569
16	1,357	325	436	30	332	2,480
15	1,277	314	447	32	318	2,388
14	1,212	307	460	36	305	2,320
13	1,206	303	481	38	298	2,326
12	1,077	291	481	35	277	2,161
11	945	277	472	30	215	1,939
1910	835	268	466	26	230	1,825
09	780	264	468	24	212	1,748
08	738	265	478	21	198	1,700

Table III   Capital Stock(Producers' Durable Equipment
-A Series- and Ships)

Unit: ¥ 1,000,000
1930 Price

Year	Ships		Producers' Durable Equip.	
	Net	Gross	Net	Gross
1939	728	2,149	9,236	15,159
38	773	2,482	7,673	13,460
37	813	2,555	6,703	12,196
36	843	2,548	6,116	11,257
35	900	2,536	5,574	10,425
34	962	2,522	5,128	9,632
33	1,044	2,529	4,834	9,130
32	1,129	2,524	4,724	8,819
31	1,206	2,509	4,753	8,594
1930	1,287	2,486	4,772	8,321
29	1,280	2,395	4,619	7,898
28	1,347	2,384	4,391	7,462
27	1,405	2,348	4,228	7,094
26	1,449	2,310	4,104	6,751
25	1,490	2,269	3,944	6,433
24	1,527	2,227	3,840	6,144
23	1,546	2,165	3,699	5,832
22	1,533	2,066	3,584	5,554
21	1,454	1,923	3,345	5,179
1920	1,187	1,598	2,931	4,639
19	1,026	1,393	2,652	4,259
18	931	1,264	2,453	3,976
17	562	869	1,986	3,438
16	436	713	1,815	3,193
15	378	634	1,699	3,022
14	349	595	1,641	2,915
13	327	549	1,668	2,875
12	301	500	1,524	2,661
11	288	468	1,368	2,407
1910	277	439	1,244	2,264
09	277	422	1,170	2,170
08	261	391	1,115	2,091
07	238	353		
06	231	331		
05	213	301		
04	194	275		
03	174	247		
02	159	225		
01	152	214		
1900	130	189		
99	116	171		
98	99	149		
97	75	122		
96	63	105		

Table IV Producers' Durable Equipment –B Series–

Unit: ¥ 1,000,000
1930 Price

Year	Net Capital Stock		Gross Capital Stock	
	Excluding Ships	Including Ships	Excluding Ships	Including Ships
1939	9,850	10,578	13,828	15,977
38	7,370	8,143	10,919	13,401
37	6,128	6,941	9,353	11,908
36	5,363	6,206	8,316	10,864
35	4,522	5,422	7,280	9,816
34	3,813	4,775	6,375	8,897
33	3,303	4,347	5,719	8,248
32	3,002	4,131	5,267	7,791
31	2,886	4,092	4,968	7,477
1930	2,772	4,059	4,783	7,269
29	2,607	3,887	4,591	6,986
28	2,358	3,705	4,283	6,667
27	2,173	3,578	4,011	6,359
26	2,021	3,470	3,739	6,049
25	1,896	3,386	3,572	5,841
24	1,828	3,355	3,461	5,688
23	1,786	3,332	3,353	5,518
22	1,773	3,306	3,300	5,366
21	1,692	3,146	3,134	5,057
1920	1,654	2,841	2,994	4,592
19	1,595	2,621	2,839	4,232
18	1,537	2,468	2,683	3,947
17	1,450	2,012	2,485	3,354
16	1,408	1,844	2,339	3,052
15	1,348	1,726	2,197	2,831
14	1,310	1,659	2,074	2,669
13	1,319	1,646	1,935	2,534
12	1,212	1,513	1,792	2,292
11	1,063	1,351	1,566	2,034
1910	956	1,233	1,456	1,895
09	883	1,160	1,315	1,737
08	856	1,117	1,224	1,615
07	751	989	1,069	1,422
06	643	874	917	1,248
05	560	773	796	1,097
04	444	638	647	922
03	377	551	552	799
02	331	490	482	707
01	285	437	416	630
1900	247	377	360	549
99	230	246	330	501
98	214	313	304	453
97	183	258	266	388
96	160	223	234	339
95	153		219	
94	147		202	
93	142		187	

Table V Capital Stock(Public Works)

Unit: ¥1,000,000
1930 Price

Year	Road & Bridge		Harbor		Riparian		Total	
	Net	Gross	Net	Gross	Net	Gross	Net	Gross
1940	1,751	2,393	415	709	1,081	1,840	3,247	4,942
39	1,731	2,333	404	685	1,061	1,806	3,196	4,824
38	1,694	2,257	393	662	1,044	1,767	3,131	4,686
37	1,639	2,165	384	641	1,029	1,733	3,052	4,539
36	1,566	2,056	373	618	1,004	1,687	2,943	4,361
35	1,426	1,884	349	582	978	1,643	2,753	4,109
34	1,317	1,745	327	551	948	1,594	2,592	3,890
33	1,208	1,612	303	517	914	1,543	2,425	3,672
32	1,083	1,463	269	475	867	1,484	2,219	3,422
31	932	1,295	240	438	825	1,427	1,997	3,160
1930	831	1,176	221	412	812	1,401	1,864	2,989
29	756	1,083	205	389	800	1,371	1,761	2,843
28	686	996	193	370	787	1,340	1,666	2,706
27	612	906	182	352	771	1,306	1,565	2,564
26	552	831	169	332	756	1,272	1,477	2,435
25	551	816	158	315	745	1,246	1,454	2,377
24	514	766	149	301	740	1,225	1,403	2,292
23	489	730	141	288	732	1,193	1,362	2,211
22	462	692	131	264	718	1,156	1,311	2,112
21	426	646	121	249	704	1,121	1,251	2,016
1920	412	622	112	237	688	1,094	1,212	1,953
19	410	611	106	227	677	1,067	1,193	1,905
18	408	599	103	221	676	1,052	1,187	1,872
17	408	591	103	217	668	1,028	1,179	1,836
16	408	581	103	214	664	1,003	1,175	1,798
15	404	568	104	211	657	980	1,165	1,759
14	392	547	99	203	644	952	1,135	1,702
13	374	520	95	196	621	919	1,090	1,635
12	358	495	88	185	607	892	1,053	1,572
11	341	470	80	175	578	848	999	1,493
1910	316	437	72	164	550	807	938	1,408
09	288	402	65	155	536	781	889	1,338
08	269	377	57	145	527	758	853	1,280
07	252	354	49	135	513	733	814	1,222
06	232	328	42	126	505	712	779	1,166
05	224	315	37	120	502	697	763	1,132
04	222	307	35	117	501	684	758	1,108
03	219	299	30	111	499	670	748	1,030
02	205	281	24	104	488	647	717	1,032
01	190	260	18	97	475	623	683	980
1900	174	240	12	91	463	600	649	931

I. General Outline of Estimation

   A. Purpose and Period

This research is aimed to obtain long-run capital stock series in pre-war Japan from 1940 as far back as possible, say the turn of century, in terms of 1930 price.

   B. Scope

In terms of NW30 classification the following items are to be included in our estimation based on the criterion "reproducible tangible assets."

> Buildings,
> Railways,
> Bridges,
> Harbors and Canals,
> Water Works,
> Telegram and Telephone Equipment,[*]
> Electricity and Gas Supply Equipment,[*]
> Industrial Machinery and Tools,[*]
> Transportation Equipment,[*] and
> Ships.[*]
>
> [*] Included in PDE in this study except structure in Electricity and Gas Supply Equipment.

   In accordance with Kuznets' concept, we have tried to estimate capital stock both in peace-time and in war-time concepts, though the attempts were not always successful.

   C. Date of Evaluation

Each item is to be evaluated at the end of year, for the amount of production for PDE (international trade adjusted figures) were taken at the end of year, but as in the case of Public Works capital expenditures are on fiscal year basis. We neglectt this point, for such an adjustment would not change the result heavily and its arbitrary nature could not be avoided, whatever method might be adopted if its source would not be available.

   D. Depreciation

Straight-line depreciation method is adopted in this study, though this method does not seem to be a usual practice in business accountings in post-war Japan. The possible scrap values of assets at the end of their useful life is also disregarded.

   E. P I Method

P I Method stands for Perpetual Inventory Method advacated by Raymond W. Goldsmith. The principle of this method is the cumulation of depreciated capital expenditure or of depreciated supply of capital goods, adjusted for changes in costs or prices, to obtain the amount of annual capital stock. It can be expressed in the following formula:

$$K_t = K_{t-1} + I_t - \frac{1}{n} \sum_{t=t-n}^{t-1} I_t$$

where K_t, I_t and n denote capital stock for t-th year, real investment for t-th year and asset's useful lifetime respectively.

   For the P I the following three points are of great importance to obtain good results:

   (1) Annual capital expenditures are available for longer period than their useful lifetime;

   (2) Appropriate compilement of deflators is possible; and

   (3) Assets' lifetime is carefully decided.

II. Method of Estimation

In the following sections more detailed discussions will be made on each item. First, PDE will be taken up, and secondly, Ships, though involved in this category, will be discussed separately. Finally, we will discuss on Public Works such as Road & Bridge, Harbor and Riparian. The main problem here is to decide what and how much are to be treated as capit| expenditures in the total ones.

A. P D E -excluding Ships-

1. List of PDE by their lifetime

1st group (20 years)

1) Machinery & Equipment

2) Rolling Stock

3) Ships

2nd Group (15 years)

1) Tools & Instruments and Others(The last item consists of flywheels, gears, wheels, shafts, bearings & other parts and Production of Midget Industry)

3rd group (6 years)

1) Automobile and Other Vehicles

4th group (10 years)

1) Finishing & Repair Fees

2) Non-military Repairs by Government

5th group

1) Weapons & arms

2) Others in "Others"(from Mr. Rosovsky's classification of PDE)

2. P D E Series

a. From Kōjō tōkeihyō PDE series are available for 1909, 1914 and from 1919 to 1940. As 1909 figures are generally believed to be underestimated, we only use the rate of composition of each item.

b. For the rest years many estimations were made by connecting Kōjō tōkeihyō with Koide Index, and finally we decided to adopt such an estimate as linging 1930 figure from Kōjō tōkeihyō with Koide Index. The ratio between Kōjō tōkeihyō figures and figures derived from Koide Index from 1926 to 1930 is 0.824, but as mentioned in the next section Ships for 1914, 1919 and 1920 are underestimated in Kōjō tōkeihyō the new estimates are adopted. In this case, however, the above ratio for 1914 rises to 0.931 and the final result is obtained by multiplying 0.931 by the series which are derived from linking Koide Index with 1930 Kōjō tōkeihyō figures. The comparison of the new series with Rosovsky's is as follows:

(1) Before 1918 the new series are always higher than Rosovsky's due mainly to the new estimate of Ships;

(2) For 1919 and 1920 the same relation is true, but the difference is partly due to inflators adopted as well as the new estimate of Ships; and

(3) From 1921 to 1930 the differences between the two series are only due to inflators. Mr. Rosovsky uses GRJE's non-agricultural product deflator, while in this study inflators for 1955 National Wealth Survey (NW55), transformed into 1930 as a base year, are utilized in the following way.

(i) General Machinery Inflator

(a) Machinery & Equipment

(b) Automobile and Other Vehicles

        (c) Military Production by Private Industry

    (ii) Furniture & Fixture Inflator

        (e) Tools & Instruments and Others

        (f) Repairs (4-1) and 4-2))

        (g) Production of Midget Industry

    (iii) Ships Inflator

        (h) Ships

    (iv) Rolling Stock Inflator

        (i) Rolling Stock

   c. In order to get 1930 capital stock figure for a 20-year lifetime asset with the P I we should have annual production figures until 1909. Hence, subdivision of PDE is necessary and indispensable. The reason why Ships are separated from this category is due to their high weght and their independent possibilities of estimation.

    The annual rates of composition of these items in 1930 price are not stable for 1909, 1914 and 1919, and simple linear interporations were made, for it is impossible to estimate the rates for 1910-'13 and 1915-'18 with 100 per cent total and annual fluctuations among the rates of composition.

   d. International adjustment is made by adding imports from foreign countries, Korea and Taiwan to and subtracting exports to foreign countries, Korea and Taiwan from domestic

Annual Rate of Composition

	1909	1914	1919
Machinery & Equipment	44.0	53.8	49.6
Rolling Stock	5.6	9.6	13.2
Tools & Instruments and Others	21.2	13.6	9.0
Automobile & Other Vehicles	2.1	1.2	6.1
Repairs	13.7	10.5	11.6
Military Production	13.4	11.3	10.6

production, in order to adopt P I Method for estimating the capital stock of PDE. This procedure is called "Commodity Flow Analysis." Sources for this adjustment are as follows:

    (1) The Department of Finance (ed.), Nihon Gaikoku Boeki Nenpyo(Annual Return of the Foreign Trade of Japan);

    (2) Toyo Keizai Shinposha(ed.), Nihon Boeki Seiran(Foreign Trade of Japan -A Statistical Survey-), 1935;

    (3) Government General of Chosen(ed.), Chosen Boeki Nenpyo(Chosen -Table of Trade and Shipping); and

    (4) The Government of Taiwan(ed.), Taiwan Boeki Nenpyo(Annual Return of the Trade of Taiwan(Formosa)).

   Freight and distribution adjustment is made for all items but Government Production by multiplying 1.15 to them after international trade adjustment has been made.

   e. From the series obtained through the above procedures capital stocks by items would be derived, but their adequacy is very limitted only after their lifetime has passed since the first year of the series available, e.g., in our case capital stock of Machinery & Equipment and Rolling Stock are available only from 1930 to 1939 and those of Tools and Instruments, Automobile & Other Vehicles and Repairs from 1925, 1916 and 1920 to 1939 respectively. Net and Gross capital stock formulae can be written as

$$K_t^N = K_{t-1}^N + I_t - \frac{1}{n} \sum_{t=t-n}^{t-1} I_t$$

and

$$K_t^G = \sum_{t=t-n}^{t} I_t$$

where K_t^N and K_t^G denote net and gross capital stocks for t-th year.

Rearranging the above formulae we have

$$K_{t-1}^N = (1 + d_t)K_t^N - I_t$$

and

$$K_{t-1}^G = (1 + o_t)K_t^G - I_t$$

where $d_t = \frac{1}{n} \sum_{t=t-n}^{t-1} I_t/K_t^N$ and $o_t = I_{t-n-1}/K_t^G$. Ten-year average of d_t $(= d)$ and that of o_t

$(= o)$ have been calculated for each item as follows:

	d	o
Machinery & Equipment	0.07	0.02
Rolling Stock	0.09	0.03
Tools & Instruments	0.13	0.07
Automobile & Other Vehicles	0.38	0.10
Repairs	0.17	0.06

With these ratios capital stock series by items are available from the above formulae backward until 1908. Let us call these series "A Series" as for simplicity.

f. With Koide Index we could have PDE series since 1868, but due to lack of some other series PDE series as a whole, excluding Ships, are available since 1875, whcih means that we could have capital stock series with the P I since 1896, assuming a certain average life-time for PDE.

Adopting the amount of each item as weght we have got it for every five year since 1909 as follows:

Year	1909	1914	1919	1924	1929	1934
Weighted Average Lifetime	16.8	17.9	17.3	18.0	15.1	15.2

As arithmetical average of these lifetime is 16.7 years we take the assumption that the life-time of PDE is 17 years throughout the period. Capital stock series obtained in this way is called "B Series."

B. Ships

1. As for Ships only quantity data are available since 1870 from Nihon teikoku tōkei nenkan. We assume total domestic production, equivalent to Kōjō tōkeihyō figures in nature, is the purchase of new domestic production plus exports, though it may have a little upward bias, for exported ships are not always new.

Another difficulty arises from its coverage, which includes registered steam and sailing (tonnage) vessels only.

2. Method of estimation

   a. The lingkage of this quantity data to K̄ōjō tokehyō figures is the most difficult task to be done, for unit prices of steam and sailing vessels might be different and the weight of the two is not stable, e.g., upward trend for that of sailing vessel if we trace backwards in the time sequence.

   For simplicity such a formula is adopted to link these two series as follows:

$$A^*_t = B_t \times \frac{\sum\limits_{1928}^{1932} A_t}{\sum\limits_{1928}^{1932} B_t}$$

where A_t : inflated amount of ships in 1930 price from K̄ōjō tōkeihyō for t-th year,
             B_t : total tonnage of domestic production from Nion teikoku tōkei nenkan for t-th year, and
             A^*_t : estimated amount of ships in 1930 price for t-th year.

Steel vessel inflator in NW55 is used in this part.

   b. Two estimations are necessary for basic quantity data:

   (1) Estimate of domestic production of sailing vessel from 1928 to 1939 is simply derived from the 1924-27 average;

   (2) Estimate of exported ships' tonnage for 1886-92 and 1889-1901 are calculated multiplying numbers of vessels exported available by the 1902-06 average tonnage per vessel for steam and sailing vessels respectively.

   c. With the series derived above net and gross capital stock series for Ships are now available from 1896. K̄ōjō tōkeihyō figures in 1930 price for 1919 and 1920 are declining backwards, while, on the contrary, domestic production for the two years from Nihon teikoku tōkei nenkan are sharply rising backwards and this can be partly proved by the production of the two shipbuilding companies, e.g., Mitsubishi Nagasaki and Kawasaki. (Cf. Fig. XI)

   Thus we have decided to adopt these estimates in the place of K̄ōjō tōkeihyō figures for 1919 and 1920 as well as 1909 and 1914.

C. Publkc Works

   The basic approach in Public Works is the same as in PDE. Therefore, a simple statement of expenditure data and inflators might be sufficient enough in this section. This part is completely dependent upon Mr. Miyazaki's, "Inventory System ni yoru Kōkyō Sisan no Suikei (Estimation of Public Works by Inventory System)," Nihon no Kokufu Kōzō(The National Wealth Structure of Japan), I. Nakayama (ed.), Tōyō Keizai Shinpōsha, 1959.

   1. Road & Bridge

   NW30 omits Road as a reproducible tangible asset, and only evaluates as a part of Land. Bridge is, on the other hand, estimated by structures, but Mr. Miyazaki made an estimation for the two items together, basing upon the Ministry of Interior,30kai Doboku Tōkei(The 30th Public Works Statistics), which supplies the two items separately from 1901.

   a. Here we should have a discussion what would be capitalizable expenditures in Public Works. Mr. Miyazaki's point is that there is no problem for new construction and reconstruction to count as capitalizable ones, but expenditures for natural disaster reconstruction add more than what would be otherwise. By drawing the distribution map of capitalizable expenditures for Road & Bridge he assumes 20 per cent of expenditures for natural disaster reconstruction as a new addition to capital stock.

b. Doboku tokei gives us only total expenditures before 1900. Therefore, subdivision of total expenditures into 1) new construction and reconstruction 2) repairs and other fees and 3)natural disaster reconstruction is operated in the following way.

    1) New construction and reconstruction

        As on semi-logarithmic diagram total and the expenditures of this item move rather parallel, we have got the ratio between the two, e.i., 0.54 and estimated expenditures for this item is derived from multiplying total expenditures by 0.54.

    2) Repairs and other fees

        This item is obtained as a residual.

    3) Natural disaster reconstruction

        The semi-logarithmic equation is fitted for the data excluding the war periods as follows:

$$\log y = 0.000006 \ x^2 + 0.045777 \ x + 2.999284$$

where x is year (1900=0) and y denotes expenditures for natural disaster reconstruction. -

    c. A brief reference to the inflator is necessary. Mr. Miyazaki uses the deflator compiled by the Ministry of Construction, but it starts from 1901. New compilement of deflator (in this case inflator) for preceeding years to 1901 is so difficult that at this stage Paved Road inflator in NW55 is adopted for the time being. Though there is no definite difference between the two, the latter fluctuates a little greater than the former. Lifetime is assumed 50 years.

    2. Harbor and Riparian

    a. As for Harbor 20 per cent of expenditures for natural disaster reconstruction are assumed as a net addition to capital stock as in Road & Bridge, but before 1900 there is no classification of this sort. We assume Jigyohi(Expenditure for Harbor) belongs to new construction and reconstruction, basing on the fact that the ratio between expenditures for natural disaster reconstruction and ordinary expenditure is less than 0.1 per cent during the first decade of the twentieth century except a year.

        The inflator compiled by Mr. Miyazaki is adopted. Lifetime of the asset is also assumed 50 years, and this holds true to Riparian.

    b. The scope of expenditures for Riparian is river, sand arrestation and coast works directed by the central and local governments. The inflator compiled by the Ministry of Construction is adopted and 30 per cent of natural disaster reconstruction fees are counted as a new addition to capital stock.

    3. So far gross and net capital stocks of Road & Bridge, Harbor and Riparian are obtained from 1925, 1926 and 1920 to 1940 respectively. The same procedure, for simplicity, as in PDE is taken. The ratios adopted are as follows:

	d	o
Road & Bridge	0.027	0.003
Harbor	0.037*	0.002
Riparian	0.032	0.006

        * Ten-year average is 0.034, but if this ratio is taken we have negative capital stock in 1900. So the maximum ratio among these ten years is adopted.

    Water Works is omitted in Miyazaki's estimation. We could get capital stock for this item using Emi-Rosovsky data, but in that case we might be forced to deal natural disaster reconstruction as an independent item unless we would make some device on it.