10-1984

Empirical Procedures

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C

Chapter IV : Empirical Procedures

Ch IV : Empirical Procedures

NIPA/SV PROCEDURE: **Employment, Wages + Variable Capital** 6/28/89

I **Latest Procedure** (6/28/89)

1. Employment (NIPA-based to match GVA, FD sources)

$\boxed{L}$ = PEP (NIPA) $\longrightarrow$ $\boxed{Lp} \equiv \left(\frac{Lp}{L}\right)_{BLS} \cdot L$ $\longrightarrow$ $\boxed{Lu} \equiv L - Lp$

– Note that PEP = FEE + SEP = full-time equiv. + self-employed persons, and that in creating this hybrid total, NIPA implicitly assumes SEP's are mostly full-time

∴ LP = LPFEE + LPSEP , LU = LUFEE + LUSEP

2. Wages and Variable Capital (NIPA-based)

(i) Correct concept for cost of labor-power is employee compensation = wages + salaries + employer contrib to soc. security. But data for EC only covers employees, whereas our employment data covers employees and self-employed.
So we cannot use EC as total cost of labor-power

Should use $EC' \equiv EC - COSS$ and $FEE' = FEE -$ No. of Corp. officers
where COSS = COS + supplements
But COSS ≅ 5% {

(ii) Instead, let $ec \equiv$ (EC)/FEE = cost of avg. full time employee.

✓ $\boxed{W} \equiv ec \cdot L$ = costs of F.E. employees + imputed wage equiv of SEP

* – This includes corp. officer's salaries and their supplements, which lead to a roughly 5% overestimate. ~~But~~ COS is only available 3 yrs. ~~back~~ ⇒ we ignore this.

(iii) Now ~~define~~ $ec_p = \left(\frac{Wp}{W}\right)_{BLS} \cdot ec$ → $\boxed{V} \equiv ec_p \cdot L_p$ } Both of these now include SEP's.
→ $\boxed{W_u} \equiv W - V$
→ $\boxed{ec_u} \equiv \frac{W_u}{L_u}$ (this is implicit in W_u)

(USE)

Data X Not available

* – This implicitly assumes that soc. sec. contributions are roughly same prop. of wp, w, which is true (see 10/26/84, pp 1–2)

II **COMMENTS ON PAST PROCEDURES** — this has no meaning for unit wages

1. 5/30/80 = VCAP419.WK1 : (i) Lp, L are same as here (ii) $ec_p = (Wp)_{BLS} \cdot f \cdot x$ (iii) $V = ec_p \cdot L_p$

~~where $f \equiv \frac{FPE}{FEE}$ = adj. to make $(Wp)_{BLS}$ conform to FEE as in employment data Lp, L.~~

$x \equiv \left(\frac{EC}{W}\right)_{NIPA}$ = " " " " " " EC concept in NIPA

– Procedure here is correct up to this point. But it then makes an error by defining $W_u \equiv EC - V$, which is wrong since EC only covers employees whereas $V \equiv wp(Lp) = wp(LPFEE + LPSEP)$ covers self-employed also

(*) – To correct this, we would have define $ec_u = (W_u)_{BLS} \cdot f \cdot x \Rightarrow W_u = ec_u \cdot L_u$. But then $(ec_p/ec_u) = (WP/Wu)_{BLS}$, which is equivalent to our simpler current procedure!

MIPA/SV Procedures : L, W, V 6/28/89

2. 10/26/84 :

- Establishes that $x \equiv \frac{EC}{W}$ is roughly the same for prod + non-production workers (pp 1-2)

~~establishes~~

- Establishes that removing COS (Comp Off. Salaries) and estimated Supplements leads to about 5% reduction in EC. ~~Also~~ COS data is only available with a 3 yr. lag.

Calculation of $S^* = S^*_\pi + S^*_L + S^*_e$

S^*_π = CORPROF + 2 + 3

(SECTION II)

(Millions of Current $US)

Line	COMPUTER NAME	TITLE	1971	1972	1973	1974	1975
1	DOM	DOMESTIC	77409	91311	111912	120395	119179
2	AGPI	– AGRICULTURE	181	459	882	434	766
3	FIRE	– FIRE	15447	16617	16553	15690	12425
4	BUSERV	– MISC BUSINESS SERV	599	754	1266	791	1401
5	PROF	– PROFESSIONAL SERV	547	834	1121	1234	1510
6	CORPROF 2	CORPORATE PROFITS BEFORE TAX	60635	72647	92090	102246	103077
	INVAL	NON-AGRICULTURAL CORPORATE BUSINESS	-5029	-6597	-19902	-39959	-11569
	INVAL 2	– OTHER	-62	-27	-214	-980	-361
	INVAL II	INVENTORY VALUATION ADJUSTMENT	-4967	-6570	-19748	-38979	-11208
		INTEREST PAID	27748	30008	38563	50182	50833
		– INTEREST RECEIVED	-7798	-8652	-12362	-16497	-16088
14	NET (I)	NET INTEREST PAID	19950	21356	26201	33685	34745
		RENT PAID	23768	26173	29833	33501	35916
		– RENT RECEIVED	-6956	-7732	-8493	-9364	-9756
18	NET (R)	NET RENT PAID	16812	18441	21340	24137	26160
	OFFIC	CORPORATE OFFICER'S SALARIES	29952	34149	39236	44568	48659
	WORK OF	NON-AGRI. CORP.	122382	140023	159119	165657	201433

Calculation of $S^* = S^*_\pi + S^*_t + S^*_e$ (Millions of Current $ US)

$S^*_\pi = 1 + PROPROF + 3$

COMPUTER NAME	TITLE	1 1971	2	3 1972	4	5 1973	6	7 1974	8	9 1975
PROPINC	PROPRIETORS/PARTNERS	52291		55767		62321		65775		67363
PROPAG	AGRICULTURE	746		754		1016		1125		1074
PROFIRE	FIRE	4407		4631		2944		2031		2342
PROPMED	PROF. SERV. MEDICAL	10603		10395		10531		10741		11755
PROPLAW	PROF SERV. LAW	5323		5801		6438		6898		7085
PROPINC2	INCOME OF PROPRIETORS/PARTNERS	31212		34186		41392		44980		45107
PROPINV2	NON AGRT., NON-CORP. INVENTORY VALUATION ADJ.	-443		-746		-1972		-3657		-1208
PROPIN	— OTHER	-18		-6		-101		-531		-120
PROPINV1	INVENTORY VALUATION ADJUSTMENT	-425		-740		-1871		-3126		-1088
	INTEREST PAID, PROP.	1569		1779		2009		2329		2644
	INTEREST PAID, PART.	748		857		1086		1640		1932
	INTEREST RECEIVED, PROP.	220		253		279		321		313
	INTEREST RECEIVED, PART.	105		122		151		226		229
PROPNET1	NET INTEREST PAID PROPRIETORS/PARTNERS	1992		2261		2665		3422		4034
should include royalties paid, which are probably net										
should include it.	RENT PAID, PROP.	4647		4886		5598		5934		6244
	RENT PAID PART.	1793		1892		1989		2283		2577
	RENT RECEIVED, PROP	705		764		1219		944		1129
	RENT RECEIVED, PART	272		296		433		363		466
PROPNET2	NET RENT PAID PROPRIETORS/PARTNERS	5463		5718		5935		6910		7226
WEQ —	WAGE EQUIVALENT	19177		21314		23358		26641		28881
PROPROF	NON-AGRICULTURAL PROPRIETORS/PARTNERS	19065		20111		24763		25545		26398

Calculation of $S^* = S^*_\pi + S^*_t + S^*_e$ (Millions of Current $ US)

$S^*_\pi = 1 + 2 + DEPADJ$

COMPUTER NAME	TITLE	1971	1972	1973	1974	1975
DEPCORP2	CORP CAPITAL ALLOWANCE	60867	67864	73676	81532	89403
DEPAG	– AGRICULTURE	534	580	758	934	1092
DEPFIRE	– FIRE	4893	5528	6118	6735	7261
BUSERVDE	– BUSINESS SERVICES	1259	1361	1709	1818	1941
DEPROF	– PROF. SERVICES	415	539	635	712	938
DEPCORP	CORP. DEPRECIATION ALLOW	53766	59856	64456	71333	78171
DEPROP2	PROPRIETORS/PARTNERS CAPITAL ALLOWANCE	15096	16810	34818	38448	41830
DEPROPAG	– AGRICULTURE	5099	5306	5184	5517	5977
DEPROPFI	– FIRE	3048	3736	20982	23165	24946
DEPROP	NON-CORPORATE DEPRECIATION ALLOWANCE	6949	7768	8652	9766	10907
ACTDEP2	ACTUAL DEPRECIATION ALL INDUSTRIES	77947	83567	91455	104228	
ACTDEP3	GOVERNMENT OWNED PRIVATELY OPERATED	1029	1014	1026	1075	
ACTDEP4	– FINANCIAL CORP.	2358	2723	3140	3678	
ACTDEP5	– AGRICULTURAL CORP	389	408	438	515	
ACTDEP6	– AGRI. NON-CORP.	5654	5889	6279	7298	
	SUBTOTAL DEDUCTIONS ACTUAL DEPRECIATION	8401	9020	9857	11491	
ACTDEP1	– ACTUAL DEPRECIATION	70575	75561	82624	93812	
DEPADJ	DEPRECIATION ADJUSTMENT	-9860	-7937	-9516	-12713	
SPI	CORPROF + PROPROF + DEPADJ	131587	152197	174366	178489	
ST	INDIRECT BUSINESS TAXES PROD. + TRADE	73500	78800	87800	94700	102600
SE[1]	WAGES of unproductive WORKERS IN PROD + TRADE	169932	182116	189284	210495	227534
SSTAR	Lines 24+26+28 (p. 3)	375019	413113	451450	483684	

1 [illegible]

Calculation of V^* = variable capital and $(Wu)_{PT} = S^*_e$

All units are in US$; Lines 21-2[illegible]

COMPUTER NAME	TITLE	1971	1972	1973	1974	1975
ECMAN	EMPLOYEE COMPENSATION MANUFACTURE	185060	203306	230375	250099	252360
ECMIN	E.C. MINING	6989	7797	8554	10392	12824
ECCONS	E.C. CONSTRUCTION	39464	43005	49361	52446	50624
ECTRANS1	E.C. TRANSPORTATION	29485	31916	36296	39565	40551
ECTRANS2	E.C. COMMUNICATIONS	12695	14614	16173	17815	19663
ECTRANS3	E.C. PUBLIC UTILITIES	8460	9336	10281	11292	12389
	SUBTOTAL	282093	309974	351040	381609	388411
ECSERV1	EMPLOYEE COMPENSATION ALL SERVICES	83250	92861	105673	118053	130590
ECSERV2	PRIVATE HOUSEHOLDS	5179	5349	4799	4556	4575
ECSERV3	MISC. BUSINESS SERVICES	12279	13647	16585	18698	19711
ECSERV4	LEGAL SERVICES	2148	2554	3150	3745	4371
ECSERV5	PROF. (Engineering) MISC. BUSINESS SERV.	7260	8139	8503	9938	10645
ECSERV6	Educational Services	7045	7817	9350	9974	10535
ECSERV7	NON-PROFIT Services	10043	10676	12815	13917	15523
ECSERV8	MEDICAL SERVICES	21378	25459	29474	34606	40908
	TOTAL DEDUCTIONS	65330	73641	84676	95234	106268
ECSERVP	TOTAL PRODUCTIVE SERV. (Lines 9 – 17)	17920	19220	20997	22819	24322
ECP	EMPLOYEE COMPENSATION PRODUCTIVE SECTORS (lines 7 + 18)	300013	329194	372037	404428	412733
COSMAN	CORP OFFICERS SALARIES MANUFACTURE	8026	8671	9711	10770	11526
COSMIN	C.O.S. MINING	269	301	321	412	480
COSCONS	COS CONSTRUCTION	3394	3772	4232	4670	4982
COSTRANS	COS TRANSPORTATION COMMUN., PUB. UTIL.	1432	1555	1734	1985	1992
COSSERVP	COS PRODUCTIVE SERV.	1499	1606	1841	2049	2147
COSP	COS PRODUCTIVE SECTORS	14620	15905	17839	19886	21127
COSTRADE	COS TRADE	10462	11826	13241	15215	16126
COSSERV	TOTAL COS IN SERVICES	6330	7959	9973	11466	13517
ECTRADE	Employee Compensation Trade	105463	115361	115384	127440	136108

(handwritten margin note beside 1971 TOTAL COS IN SERVICES: "[illegible] Share of this 80?")

Calculation V^* = variable capital
and $(W_u)_{PT} = S^*_e$

COMPUTER NAME	TITLE	1971	1972	1973	1974	1975
WMAN	ECMAN - COSMAN	176984	194635	220664	239329	240830
WMIN	ECMIN - COSMIN	6720	7496	8233	9980	12344
WCONS	ECONS - COSCONS	36070	39233	45129	49776	45642
WTRANS	(ECTRANS1 + ECTRANS2 + ECTRANS3) - COSTRANS	49198	54311	61016	66689	70610
WSERV	ECSERVP - COSSERVP	16421	17614	19156	20770	22175
WP	WAGE INCOME, PRODUCTIVE SECTORS	285393	313289	354198	384542	391601
WPWMAN	W_P/W MANUFACTURE	.684	.695	.702	.695	.678
WPWMIN	W_P/W MINING	.711	.721	.722	.725	.724
WPWCONS	W_P/W CONSTRUCTION	.889	.898	.912	.899	.874
WPWTRANS	W_P/W TRANS, COMM, PUB U	.792	.798	.803	.789	.766
WPWSERV	W_P/W SERVICES	.828	.831	.838	.825	.805
WPMAN	WPWMAN · WMAN	121057	135271	154906	166334	163283
WPMIN	WPWMIN · WMIN	4778	5405	5944	7236	8937
WPCONS	WPWCONS · WCONS	32066	36055	41158	42951	39891
WPTRANS	WPWTRANS · WTRANS	38965	43340	48996	52616	54089
WPSERV	WPWSERV · WSERV	13597	14637	16053	17135	17851
VSTAR	Wages of PRODUCTIVE WKRS	210463	234708	267057	286272	284049
WUP	WAGES, UNPROD WORKERS IN PROD SECTORS (lines 6-19, p5)	74930	78581	87141	98270	107552
WUT	wages, unprod workers in TRADE, (lines 29-27, p. 4)	95002	103535	102143	112225	119982
SE	WAGES UNprod Workers IN Prod + TRADE	169932	182116	189284	210495	227534
SSTAR	(lines 24+26, p3) + (line 23, p.5)	375019	413113	451450	483684	
SOVERV	$S^*/V^* = \frac{(\text{line 25, p.5})}{(\text{line 19, p.5})}$	1.78	1.76	1.69	1.69	

	SE	WUF	WUT	ECTRADE	COSTRADE
1929	13370		8417	9374	957
1930	12457		7878	8766	888
1931	10559		6859	7634	775
1932	7966		5340	5956	616
1933	6831		4731	5331	600
1934	7906		5475	6159	684
1935	8159		5938	6683	745
1936	9024		6478	7341	863
1937	10221		7567	8442	875
1938	10085		7558	8340	782
1939	12318		7907	8729	822
1940	13366		8472	9374	902
1941	15898		9690	10773	1083
1942	18455		10256	11349	1093
1943	21133		11189	12289	1100
1944	23171		12335	13426	1091
1945	24436		13952	15166	1214
1946	29182		18534	20222	1688
1947	32802		21562	23644	2082
1948	36749	14388	22361	24738	2377
1949	38351	15648	22703	25027	2324
1950	40602	16502	24100	26765	2665
1951	46125	19460	26665	29445	2780
1952	50055	21789	28266	31017	2751
1953	54095	23941	30154	32959	2805
1954	56935	25994	30941	33811	2870
1955	60613	27845	32768	36161	3393
1956	67100	31546	35554	39144	3590
1957	72007	34624	37383	41240	3857
1958	73145	34997	38148	42100	3952
1959	79719	38565	41154	45405	4251
1960	85224	41352	43872	48440	4568
1961	87234	42563	44671	49557	4886
1962	92247	44836	47411	52642	5231
1963	95212	44884	50328	55736	5408
1964	102919	49150	53769	59701	5932
1965	110740	52921	57819	64225	6406
1966	122969	59781	63188	70131	6943
1967	133245	65493	67752	75216	7464
1968	146247	71754	74493	82556 ✓	8063
1969	161188	79497	81691	90928 ✓	9237
1970	173205	84792	88413	97954 ✓	9541
1971	183641	88640	95001	105463 ✓	10462
1972	199041	95506	103535	115361 ✓	11826

	COSP	COSMAN	COSMIN	COSCONS	COSTRANS	COSSERV
1919	1844	822	50	59	66	75
1920	2264	997	86	84	91	95
1921	2017	878	63	84	82	95
1922	2155	911	64	84	126	123
1923	2282	960	62	93	135	134
1924	2297	970	56	106	104	147
1925	2393	1004	56	118	105	162
1926	2491	1039	55	130	105	178
1927	2588	1073	55	143	106	193
1928	2685	1107	55	155	107	209
1929	2831	1171	56	163	108	218
1930	2667	1095	50	158	104	215
1931	2287	935	45	129	96	192
1932	1796	734	38	88	85	155
1933	1703	706	37	67	80	144
1934	1825	753	41	69	87	163
1935	1974	812	42	76	95	179
1936	2326	951	48	101	103	220
1937	2452	1004	50	110	104	230
1938	2211	912	47	96	105	186
1939	2327	965	47	100	110	187
1940	2585	1076	50	112	123	198
1941	3168	1341	54	137	137	212
1942	3587	1531	54	154	147	224
1943	3685	1583	52	144	148	227
1944	3706	1599	51	128	154	226
1945	4009	1734	51	130	166	245
1946	4812	2073	56	178	187	301
1947	5466	2321	69	249	216	359
1948	5898	2469	88	321	238	401
1949	5864	2422	90	356	249	415
1950	6548	2711	98	404	278	444
1951	7097	2936	101	436	304	485
1952	7377	3018	105	478	325	538
1953	7645	3104	108	521	346	570
1954	7832	3173	110	548	347	591
1955	8753	3525	122	615	401	687
1956	9121	3588	133	728	432	785
1957	9673	3741	140	829	469	893
1958	10185	3927	146	913	474	944
1959	10969	4173	138	1005	538	1080
1960	11737	4438	155	1067	600	1194
1961	12458	4621	166	1207	627	1382
1962	13697	5060	172	1347	723	1507
1963	14379	5226	186	1482	750	1695
1964	14813	5479	203	1629	793	1433
1965	16767	5949	184	1898	845	2126
1966	18260	6464	214	2025	922	2385

1967	19315	6660	196	2281	1015	2699
1968	20479	6961	211	2440	1091	3026
1969	23320	7773	244	2741	1239	3794
1970	25230	7828	272	3174	1313	5087
1971	27206	8026	269	3394	1431	6329
1972	30626	8670	300	3772	1555	7959
1973						
1974						

COSSORV

DATA SUMMARY: S/V Empirical

6/79

1. S^*	SSTAR
S_π^*	SPI
S_t^* ✓	ST
S_e^*	SE
2. V^*	VSTAR
3. $(W_v)_{PT} = S_e^*$	SE
4. S^*/V^*	SOVERV
5. $L^* \equiv S^* + V^*$	LSTAR
6. K (Current $, BEA)	CAPST

[illegible] GDP — [illegible] includes: [illegible], TRADE!

$S^* \equiv S_\pi^* + S_t^* + S_e^*$ — SSTAR

$S_\pi^* = 1. + 2. + 3.$ — SPI

1. <u>Non-Agric Corporations</u> — <u>CORPROF</u>

(i) Corp. Profits Before Tax — CORPROF1I

Domestic : <u>NIPA</u> 6-19, 2 ; 1929–1974 — DOM

– Agric : " " , 3 ; " — AGRI

– FIRE : " " , 53, 1929–1947 ; 51, 1948–1974 — FIRE

– Misc Bus. Svces : " " , 64, 65 : 1929–1972 — BUSERV

– Prof. Svces : " " , 69 : 1929–1972 — PROF

(Misc. Svces = Health, Legal, Educ. + Misc. Professional)

(ii) Invent. Val. Adjustment — INVAL1II

Non Agric Corp. Bus : <u>NIPA</u>, 6-16, 1 [illegible] — INVAL

– Other : " " , 14 — INVAL2

* (iii) Net Int. Paid : Mage, B-IV, (c) 1900–1958 + Shaikh 1959–1972 — NET1

* (iv) Net Rent Paid : Mage, B-IV, (d) 1900–1958 + Shaikh 1959–1972 — NETR

(v) Corp. Officers Salaries : Mage B-IV (b) 1900–1958 + Shaikh 1959–1972 — OFFIC

[illegible]

COMP INV?

2. Non Agric Prop/Partners

PROPROF

(I) Income of Prop/Partners (1929-1972) — PROPINC2 I

Prop/Partners, NIPA, 6-14, 2, 1929-1974 — PROPINC

— Agric, " " 3, " — PROPAG

— FIRE, " ", 15, " — PROPFIRE

— Prof. Svces, MEDICAL, NIPA, 6-14, 17, 1929-1974 — PROPMED

— Prof " , LAW, " " 18 " — PROPLAW

(II) Invent. Val. Adjust (1929-1972) — PROPINVAL2 II

Non Agric, Non Corp, NIPA 6-16, 15, 1929-1974 — PROPINVAL

— Other " " ", 24, " — PROPINVAL2

(III) Net Int. Paid: Mage, B-V, (E) 1900-1958 + Shaikh 1959-1978 — PROPNET1

(IV) Net Rent Paid: Mage B-V, (E) 1900-1958 + Shaikh 1959-1978 — PROPNETR

(V) — Wage Equiv: — WEQ

Mage B-V(E), 1900-1958 — WEQMAGE

Shaikh, 1949-1978 — WEQSHAIKH

3. Depreciation Adjustment — DEPADJ

/ (I) Corp. Deprec. Allowances (1929-1972) — DEPCORP3I

Corp. Capital Allowances, NIPA, 6.24, 1, 1929-1974	DEPCORP
– Agric , " 2 , "	DEPAG
– FIRE , " , 52,50 , " paper lists 64,65	DEPFIRE
– Bus. Services , " , 63,64 , 1929-1972	BUSERVDEP
– Prof. Svces , , 68 , 1929-1972	DEPROF

/ (II) Non-Corp. Deprec. Allowances — DEPPROP3II

Prop/Partners, NIPA, 6.15, 2 , 1929-1974	DEPPROP
– Agric 3 , "	DEPPROPAG
– FIRE 16 , "	DEPPROPFIRE

(14) – Actual Depreciation (Current $, 1925-1974) — ACTDEP

All Industries BEA, 88, C3, [Straight line Deprec Current Cost] · 85F	ACTDEP88C3
Govt. Owned Privately Operated, BEA, 270, Col 3	ACTDEP270C3
– Financial Corp. , " , 112, Col 3 ,	ACTDEP112C3
– Agric Corp , " , 103 , "	ACTDEP103C3
– Agric Non-Corp , " , 124, 3	ACTDEP124C3

S_t^* — 1900-1953, Mage, 270 (8) + 1954-1973, NIPA: 1929-1974, ~~SCB (April 1967)~~, Table 6.1, pp 178-180; ~~Table 1, 1947-1965; subsequent years in July SCB, Table 6.22~~ ~~1978 July SCB, Table 6.4~~ (GNP & Components by Industry) — ST

$S_e^* = (W_v)_{pr} = W_T + (W_p)_u$: See Wages and Variable Capital — SE ✓

Generate totals

V^*

$(W_u)_{PT} = S^*_e$

VSTAR	
SE	
ECP	

1. $(EC)_p$ = Employee Compensation, Productive Sectors.

(i) Manufact.: NIPA, 6.5, line 13, 1929-1974	ECMAN
(ii) Mining: " " 6 "	EC MIN
(iii) Construction: " " 12	ECCONS
(iv) Transp, Communic, Public Utilities	ECTRANS no total
( ) Transportation, NIPA, 6.5, 36, 1929-1974	ECTRANS1
( ) Communications, 44	ECTRANS2
( ) Public Utilities, 47	ECTRANS3
(v) Services & NIPA, 6.5, 1929-1974	ECSERVP
(a) All Services, lines 60, 59	ECSERV
(b) - Private Households, 63, 72	ECSERV1
(c) - Business Services, 65, 62	ECSERV2
(d) - Legal " , 70, 68	ECSERV3
(e) - Prof. (Engineering), 71, 71	ECSERV4
(f) - Educ. Svces, 72, 69	ECSERV5
(g) - Non-profit Svces, 73, 70	ECSERV6
(h) - Medical Svces, 69, 67	ECSERV7

2. $(COS)_p$ = Corp. Officers' Salaries, Prod. Sects, 1929-1972

	COSPSP no total = OFFIC (see S_{PT}^*)
(i) Corp. Officers' Salaries, Manuf.	COSMAN
(ii) " " , Mining	COSMIN
(iii) " " , Construction (should be prof. services only)	COSCONS
(iv) " " , Transportation, Commun, Utilities	COSTRANS
(v) " " , Services & Pr	COSSERV
(vi) Trade FTRE	COSTRADE
(vii)	COSFIRE

Add

Generate totals

V^*

$(W_U)_{PT} = S^*_e$

VSTAR	
SE	

1. $(EC)_p$ = Employee Compensation, Production Sectors

(i) Manufact.: NIPA, 6.5, line 13, 1929-1974	ECMAN
(ii) Mining: " " 6 "	EC MIN
(iii) Construction: " " 12	ECCONS
(iv) Transp, Commun, Public Utilities	ECTRANS no total
( ) Transportation, NIPA, 6.5, 36, 1929-1974	ECTRANS1
( ) Communications, 44	ECTRANS2
( ) Public Utilities, 47	ECTRANS3
(v) Services & NIPA, 6.5, 1929-1974	ECSERVP
(a) All Services, lines 60, 59	ECSERV
(b) - Private Households, 63, 72	ECSERV1
(c) - Business Services, 65, 62	ECSERV2
(d) - Legal " , 70, 68	ECSERV3
(e) - Prof. (Engineering), 71, 71	ECSERV4
(f) - Educ. Svcs, 72, 69	ECSERV5
(g) - Non-profit Svcs, 73, 70	ECSERV6
(h) - Medical Svcs, 69, 67	ECSERV7

2. $(COS)_p$ = Corp. Officers' Salaries, Prod. Sect, 1929-1972

COSBSP no totals = OFFIC? (See S_{PT}^*)	
(i) Corp. officers' salaries, Manf.	COSMAN
(ii) " " , Mining	COSMIN
(iii) " " , Construction	COSCONS
(iv) " " , Transportation, Comm, Utilities	COSTRANS
(v) " " , Services	COSSERV ✓ OK
(vi) Trade	COSTRADE
(vii) FIRE	

check

V.2

verify this — Peter's description seems ambiguous about calculation procedure

(1948–1972 only)

3. $(W_I)_P$ = Wage Productive Sectors Employee Income $\equiv (EC - COS)_P$, 1929–1974. — W_{IP} Total

(i) ECMAN – COSMAN — WMAN

(ii) ECMIN – COSMIN — WMIN

(iii) ECTRANS1 + ECTRANS2 + ECTRANS3 – COSTRANS — WTRANS

(iv) ECONS – COSCONS — WCONS

(v) ~~ECSERV = $\sum_{j=1}^{7}$ ECSERVj – COSSERV~~ (1948–1972) — WSERV

= ECSERVP – COSSERVP ↓ can't subtract

≅ ECSERVP – COSSERV · (ECSERVP / ECSERV) (COS) services

The actual calculations in printout are wrong, off, since they are ECSERV – COSSERV (see WPSERV also)

4. $\left(\frac{W_P}{W}\right)$ = Wages of Productive Workers / (Payroll – Corp. officers' salaries)

(i) $\left(\frac{W_P}{W}\right)_{MANUF}$: see sheets, V*, Manuf., 1919–1972 — WPWMAN

(ii) $\left(\frac{W_P}{W}\right)_{MINING}$: – – , V*, Mining, 1919–1974 — WPWMIN

(iii) $\left(\frac{W_P}{W}\right)_{CONSTRUCTION}$: – – , V*, Constr., 1919–1974 — WPW CONS

(iv) $\left(\frac{W_P}{W}\right)_{TRANSP, COMMUNIC, UTILITIES}$: – – , V*, Transp, etc., 1919–1974 — WPW TRANS

(v) $\left(\frac{W_P}{W}\right)_{SERVICES}$: – – , –, Services, 1919–1974 — WPWSERV

What is W now? Is it adjusted for COSSERP or COSSERV?

5. V^* = variable capital = wages of productive workers — VSTAR

(i) $V^*_{MAN} \equiv (WMAN)_{MAN} \cdot \left(\frac{W_p}{W}\right)_{MAN}$ = WPWMAN • WMAN — WPMAN

(ii) $V^*_{MIN} \equiv (WMIN)_{MIN} \cdot \left(\frac{W_p}{W}\right)_{MIN}$ — WPMIN

(iii) $V^*_{CONSTR} \equiv (WCONS)_{CONSTR} \cdot \left(\frac{W_p}{W}\right)_{CONSTR}$ — WPCONS

(iv) $V^*_{TRANS} \equiv (WTRANS)_{TRANS} \cdot \left(\frac{W_p}{W}\right)_{TRAN}$ — WPTRANS

(v) $V^*_{SERV} \equiv (WSERVP)_{SERV} \cdot \left(\frac{W_p}{W}\right)_{SERV}$ — WPSERV

This data is wrong too because WSERV is wrong

6. $(W_U)_{PT} = S^*_e$ = Wages of Unprod Workers in Prod. & Trading Sectors — SE

1948-1? only, since WSERV only ok for the period

(i) $(W_U)_P$ = (WIP) $- V^*$ = WIP − VSTAR — WUP

(ii) $(W_U)_T$ — WUT

a) $(EC)_{Trade}$ — ECTRADE

b) $-(EOS)_{Trade}$ — COSTRADE

1948, WSERV ↓ by −8000 } $(W_U)_P$ = WUP ↓ by −1000
V^* ↓ by −7000

∴ SE = WUP+WUT ↓ by −1000

∴ S^* ↓ by −1000 and V^* ↓ by −7000

Maye uses unpublished worksheets from NBER

Productive and Total Worker-Hours and Wages

6/79

	1919 – 1946	1947 – 1974
1. MANUFACTURING (see sheets 6/5/78)		
	L	L
	L_p	L_p
	W (every two years)	W
	W_p (")	W_p
	L_p/L	L_p/L
	W_p/W	W_p/W
2. MINING (sheets 6/8/78)		
	L	L
	–	L_p
	$[W]$ (1919, 1939 only)	$[W]$ (39, 54, 58, 63 only)
	$[W_p]$ (")	$[W_p]$ (")
Interpolated between benchmark years using 1919-1946 MANUF. data and 1947-50 mining data avg. (See sheets)	$[L_p/L]$ (interpolated)	L_p/L
Interpolated between benchmark yrs. using (L_p/L)?	$[W_p/W]$ (interpolated between census yrs.)	$[W_p/W]$ (interpolated between census yrs.)
3. CONSTRUCTION (Sheets 6/9/78)		
	L	L
	–	L_p
	–	–
	–	–
	–	L_p/L
Interpolated between benchmark years using L_p/L	–	$[W_p/W]$ (interpolated between census yrs)

Productions and Total Worker-Hours and Wages 6/79

	1919–1946	1947–1974
4. TRANSP + COMMUNIC + UTILITIES (Sheets 6/10/78)		
	L	L
	—	[L_p] (1964–1974 only)
	—	—
	—	—
		[L_p/L] (64–74 only)
	—	—
5. SERVICES (Sheets 6/10/78)		
	L	L
	—	[L_p] (64–74 only)
	—	—
	—	—
	—	[L_p/L] (64–74 only)
	—	—

6/11/79 Called NBER 617 868-3900

~~[Bob Allison: he will pass on request for data L, L_p, W, W_p to two groups (labor, productivity) & get back to me by a week]~~

Don Stalow will check with boss (11/28/79)

Wage only get "employee man-hours" (i.e. L) from NBER. He then splits this into L_p/L via W/W estimates (p.210, Kop)

UPDATING S/V Data

Basic Categories: S_π^*, S_e^*, S_t^*, V^*

I. S_π^* (Sources and Method: SCB, July 1976, 1978, 1980. Method see S/V paper, Appendix A.1)

	1973	1974	1975	1976	1977	1978	1979	1980
1. Non Agric. Corp	154149 ✓	161180 ✓	189323	237056	261510			
(i) Corp. Profits Before Tax ✓	88819	100138	97369	124234	136513	157224		
(ii) Invent. Val Adjust ✓	-18259	-37215	-12079	-14421	-14822	-24872		
(iii) Net Int. Paid	26201	33685	34091					
(iv) Net Rent Paid	18149	20004	22235 est.					
(v) Corp Offic. Salaries	39239	44568	47707 est.					
(iii)+(iv)+(v)	83589	98257	104033	127243	139819			
2. Non Agric Prop/Partners	-8134 ✓	-14151 ✓	-16760	-17645	-16637			
(i) Income of Prop/Partners ✓	37720	39625	40585	45363	50376	56972		
(ii) Invent. Val Adjust ✓	-1693	-3397	-1058	-1139	-1172	-1976		
(iii) Net Int. Paid	2706 (.43 of net rent)	3477 (.524)	4103 (.628)	4467 (.656)	5779			
(iv) Net Rent Paid	6292	6638	6532	6805	7654			
(v) Minus Wage Equivalent	-53159	-60494	-66922	-73141	-79274			
3. Depreciation Adjustment	-9935 ✓	-14730 ✓	-26762	-29957	-28178			
(i) Corp. Deprec. Allowance ✓	64,415	69,978	78,049	85,302	96,127	105,537		
(ii) Non-Corp. Deprec. Allowance ✓	8,275	9,104	10,689	11,541	13,095	14,354		
(iii) Minus Actual Depreciation ✓	-82,625 ✓	-93,812 ✓	-115,500	-126,800	-137,400	-150,060		
4. $S_\pi^* = 1 + 2 + 3$	136080 ✓	132299 ✓	145801	189454	216694			

Thus $\pi < 0$!

Ratio of $\frac{(iii)+(iv)+(v)}{(i)}$ rises steadily

1973	1974	1975
.941	.981	1.07

Use 1974-75 ratios, [illegible] trend appears to be peaking ≈ 1.024

→ linear trend

.755 of net rent

Estimating Variable Capital, 1975-1978 4/80

1. For productive sectors: MAN, MIN, CONSTR, TRANSP/COMM UTIL, SERV

we calculate

(I) EC_i (II) COS_i

(III) $W_i \equiv EC_i - COS_i$ (IV) $\left(\frac{W_p}{W}\right)_i$ [Census, BLS data]

(IV) $(W_p)_i \equiv \left(\frac{W_p}{W}\right)_i \cdot W_i$

(V) $(W_u)_p^{Total} = \Sigma W_i - \Sigma (W_p)_i$

(VI) $W_u^{Total} \equiv (W_u)_p + W_{Trade} = S_e^*$

2. Since COS is not available after 1973 (1974 at latest), I must estimate it (or estimate ratio $ECOS_i/EC_i$, since $W_i = EC_i \left[1 - \frac{COS_i}{EC_i}\right]$). I do this by using 1968-1973 average to estimate W_i for 1974-1978.

(I) COS data for 1968-1972 is from printout, 6/79 and 1973 is from Stat. of Income. EC 1968-1974 from ↑.

(II) EC for 1975-1978 is from July 1979 SCB

(III) COS data for 1974-1978 is est. as indicated above

Est. Variable Capital

4/80

MANUFACTURING

	EC	COS	W	(Wp/W)	Wp
1968	165106	6961			
1969	178807	7773			
1970	180723	7828	.043001		
1971	185010	8026			121128
1972	203306	8670		.6953	135311
1973	229244		219367	.6445	141382
1974	248558		237870	.6317	150262
1975	251405		240594	.6093	146594
1976	285766		273478	.6202	169611
1977	322896		309011	.6261	193472
1978	364279		348645	(.6261)*	218268*
1979					

MINING

	EC	COS	W	Wp/W	Wp
	5612	211			
	6222	244			
	6719	272	.03887		
	6989	269			4852
	7797	300			5473
	8643		8037	.733	5891
	10407		10002	.734	7341
	13161		12649	.734	9284
	14945		14364	.735	10558
	17337		16663	.735	12247
	20216		19478	.725	14122

$\frac{Wp}{W} \equiv \left(\frac{wp}{w}\right)\left(\frac{Lp}{L}\right) \equiv \left(\frac{Wp}{W}\right)^{t}_{MAN} \left(\frac{Lp}{L}\right)^{t}_{CONSTR}$; $\left(\frac{wp}{w}\right)_{MAN}$; $(Wp)_{CONS}$; $\left(\frac{wp}{w}\right)_{MAN} \cdot W_{CONSTR} = \left[\frac{\left(\frac{Wp}{W}\right)^{t}_{MAN}}{\left(\frac{Lp}{L}\right)^{t}_{MAN}}\right]\left(\frac{Lp}{L}\right)^{t}_{CONSTR} \cdot (W)^{t}_{CONSTR}$

CONSTR

	EC	CO's	W	$\left(\frac{wp}{w}\right)_{MAN}$ use	$\left(\frac{Lp}{L}\right)_{CONS}$	$(W_p)_{CONS}$
1968	30201	2440				
1969	34216	2741				
70	36318	3174	.085			
71	39464	3394				28242
72	43005	3772				30568
73	48395	44295*	.876*	.825		32011**
74	51488	47126	.869	.817		33381
75	50793	46490	.856	.797		31717
76	55041	50378	.909	.787		36040
77	61094	56010	.872	.784		38291
78	71567	65504	.871	.792		45187
79						

TRANSP/COMMUN/PUBLIC UTIL.

	EC	COS	W	$\left(\frac{wp}{w}\right)_{MAN}$	$\left(\frac{Lp}{L}\right)_{TRANS}$	Wp
	38845	1091				
	42907	1239				
	46868	1313	.0282			
	50630	1431				40193
	55866	1555				44366
	62831	61060	.876	* .865		46268**
	68394	66466	.867	* .864		49789
	72608	70561	.856	* .857		51763
	81434	79138	.909	* .855		61506
	91384	88807	.872	* .850		65824
	103672	100749	.871	* .841		73800

Estimating Variable Capital

4/80

	(SERV)PROD						TRADE			FIRE		
	(EC)P	COS	WN	$(\frac{W_P}{W})_{MON}$	$(\frac{L_P}{L})_{SVC}$	W_P	EC	COS	W	EC	COS	W
1968	14779	3026	48321		.919		82556	8063	74493	25749	4443	
69	16121	3794	54034		.912		90928	9237	81691	28615	5009	
70	17083	5087	58217		.907		97954	9541	88413	31068	5293	
71	17920	6329	62840		.904	62840	105463	10462	95001	34453	6037	
72	19220	7959	69355		.903	69355	115361	11826	103535	38128	6720	
73	21297	104468	79773	.876 *	.903	68103	128700		115855	42391	7264	
74	23211	116754	89154	.867	.902	69721	142510		128287	46536	7690	
75	24243	131356	100304	.856	.898	77102	152956		137691	49870	8974*	
76	27070	148201	113167	.909	.896	92170	170229		153240	55072	9468*	
77	29955	167394	127823	.872	.894	99647	188448		169640	61813	10627*	
78	34585	191759	146429	.871	.890	113510	213484		192178	70866	12183*	

* See Constr. + Transp. for details

ECSERV (COS column, 1973–78) — W

.0998 — .9002 — .192

↓ ECSERVP

By definition,

(WSERV) = ECSERVP ← productive services only
− COSSERV

But actual data is generated by ECSERV − COSSERV, where ECSERV = all services

This is a mistake in computer program. I have followed the same mistake into 73–78 to get consistent results.

Thus

	ECSERV	WSERV
1968	61534	48321
1969	69482	54034
1970	76273	58217
1971	83250	62840
1972	92861	69355
	383400	292767

.7636

This ratio .7636 is used for 1973–78

Estimating Variable Capital

	WPMAN	WPMIN	WPCONS	WPTRANS	WPSERV	WP
1972	135311	5473	30568	44366	69355	285073 ✓01
1973	161382	5891	32011	46288	63103	288658 02
1974	150262	7341	33381	49789	69721	310494 03
1975	146594	9284	31717	51763	77102	316460 04
1976	169611	10558	36040	61506	92170	369885 05
1977	193472	12247	38291	65824	99647	409481 06
1978	218268	14122	45187	73800	113510	464887 07

In each year $(W_U)_p \equiv \Sigma W_\gamma - \Sigma(WP)_\gamma = W - WP$

	W	WP (see above)	$(W_U)_p$	W_T =	$(S_e)^* = (W_U)_p + W_T$
1972		01	91506	107535	199041
73	412532	02	123877	115855	239732
74	450618	03	140124	128287	268411
75	470598	04	154138	137691	291829
76	530525	05	160640	153240	313880
77	598314	06	188833	169640	358473
78	680775	07	215888	192178	408066

A. Shaikh 10/26/84

REVISED PROCEDURE FOR CALCULATING VARIABLE CAPITAL

1. The basic idea in calculating variable capital is to estimate the cost of hiring productive labor power

(i) The cost to the capitalist of hiring one unit of labor power is the gross labor cost, including employer contributions to social security and/or private pension plans. This is known in NIPA categories as Employee Compensation (EC). Conceptually,

Employee Compensation = Gross Wages and Salaries
+
Supplements to Wages and Salaries

where

Supplements to Wages and Salaries

= Employer Contributions to Soc. Security
+
Employer Contrib. to Private Pension Plans
("Other Labor Income")

(ii) The number of production and non-supervisory workers in the productive sectors is directly available from the Employment and Training Report of the President. Let this be LP.

(iii) Also available from the Employment and Training Report of the President is the Gross Wage per production and non-supervisory worker (GWP). This is only lacking the employer contributions to social security and/or private pension plans. Such data is not generally available for all production workers, though it recently available for manufacturing, for 1966-1977 only, from the Handbook of Labor Statistics, Bulletin 2070, December 1980, Tables 132-133.

From the above source, it is easy to see that Supplements to Wages and Salaries per worker are roughly proportional to the gross wage per worker, for different categories of workers in a given sector of production. Keeping in mind that in Manufacturing the category of "Non-Office Worker" is the same as production workers (footnote 5, Table 132, p. 318), we see that for example in 1968 the ratios of Supplements/Gross Wages and Salaries were

	Nonoffice	All Workers	Nonoffice/All
Manuf.	.131	.126	1.039
Nonmanuf.	.114	.107	1.061

More generally, we can calculate the ratio of Nonoffice/All worker ratios of Supplements/Gross Wages, for all available years 1966-1977. Let

X = Supplements/Gross Wages, Nonoffice Workers
Supplements/Gross Wages, All Workers

Then, for Manufacturing and Nonmanufacturing, 1966-1977, X is

	1966	1968	1970	1972	1974	1976	1977
Manuf.		1.04					
Nonmanuf.		1.06					

(iv) The fact that Supplements are roughly proportional to Gross Wages for different occupations in a given sector implies that we can estimate the production worker supplements from the gross wages of production workers and the average ratio of Supplements to Gross Wages and Salaries for all workers in a particular branch of production. The latter ratios are easily available, at a detailed industry level, in NIPA Tables ....

2. Sample Calculation, Manufacturing, 1968

No. of Prod. Workers = LPMAN = 14514 [1] (Thousands)

Avg. Annual Gross Wage per Prod. Worker = GWPMAN

= Avg. Gross Weekly Wage per Prod. Worker [2] x 52 = 6370.5 ($)

Avg. Ratio of Wage Supplmnts to Gross Wages & Salaries = WSGW [3]
= 19.38/145.82 = .133

Therefore,

Employee Compensation per Prod. Worker = ECPMAN = GWPMAN (1 + WSGW)
= 6370.5 x 0.133 = 7217.18

Total Variable Capital = VMAN = LPMAN x ECPMAN = 104.75 (Bill. $)

---

[1] Employment and Training Report of the President, 19.., Table C.2, p.
[2] ibid, Table C.3
[3] NIPA:1929-1976
Total Supplmnts = Employer Contrib. to Soc. Sec. (Table , line)
+ Other Labor Income (Table , line)

Gross Wages and Salaries = Wages and Salaries (Table , line)

3. The above mode of calculation can be compared to the one used up to now in the printout of data set "Derived Nipa", July 8, 1983 (Kathy Kazanas)

Employee Compensation, Manuf. = ECMAN = 165201 (NIPA, Table)

Corporate Officer's Salaries = COSMAN = 6961

Employee Compensation of Workers = WMAN = ECMAN - COSMAN = 158240

(Note: this measure of EC of workers is slightly overstated, because even though we have taken out Corp. Offic. Salaries, we have not taken out the Supplements (Employer Contributions to Private Pension Funds, etc.) to Corp. Offic. Salaries. On the conservative estimate that Corp. Officers receive the same proportion of their total compensation as Supplements as does the average employee (=.133 from the first method, in 2 above), the estimated total compensation of Corp. Officers would be COS(1.133) = ECCO = 6961 x 1.133 = 7887, so that the corrected WMAN = 165201 - 7887 = 157314. This is only slightly different from the unadjusted figure of 158240)

Prod. Wkr Wages/All Wkr Wages = WPWMAN (Census of Manuf.)

$$= \frac{\text{Payroll of Prod. Workers}}{\text{Total Payroll - Corp. Off. Salries}}$$

$$= .696458$$

(Note: Total Payroll includes Corporate Officer's Salaries, as explained in the definitions in the Census of Manufactures. Therefore the denominator in the above ratio is adjusted for this)

Variable Capital in Manuf. (1968) = WPMAN = WMAN x WPWMAN

= 110.21 (Bill. $)

If this is corrected for the initial oversight concerning the supplements to COS, then

Variable Capital in Manuf. (1968) = 157314 x .696458 = 109.56

By way of comparison, the results from the previous procedure were

Variable Capital in Manuf. (1968) = VMAN = 104.750

The difference of the corrected WPMAN = 109.56 from VMAN, as a % of VMAN is

(WPMAN - VMAN)/VMAN = 4.6 %

5. Though the two methods give roughly similar results, the first method is much simpler and more efficient principally because good data is directly available for numbers and gross wages of production workers, for all productive sectors, in the Employment and Training Report of the President. The only approximation process involved here is that of approximating the supplements to the gross wages of production workers, and since this magnitude is only roughly 10% of the gross wage, errors in estimating the supplements have only a small effect on the total estimate of production worker employee compensation. Thus the estimates of variable capital derived in this method are likely to be fairly robust to the approximations used in estimating supplements. We have also seen that the approximation method itself is quite accurate, since we have direct estimates supplements of the total manufacturing and nonmanufacturing sectors, from 1966-1977.

On the other hand, in the method we have used until now, the estimates of COS are from IRS data, which is frequently unavailable for the most recent 3 years. More importantly, this method is quite sensitive to the sectoral estimates of the ratio of production worker wages to all wages. Here, the problem is that whereas relatively good Census data is available on this for manufacturing, it is not so good for mining, construction, etc., and is positively skimpy or nonexistent for services -- specially in years prior to 1966. Thus a whole chain of interpolations and approximations were devised and tested. Though the differing results were reasonably close, their variations have a greater effect on estimates of variable capital than in the first method, precisely because this ratio is used to directly convert WMAN into WPMAN. The estimates of variable capital are therefore less robust in the face of variations in the approximation methods, and these approximation methods are themselves less reliable (and much more involved).

For the above reasons, the first method is the method of choice.

NIPA/SV : COS and Wage Measures

6/[illegible]/91

1. Adj. for COS

(I) In NIA book

(Appendix F-1) ① L_γ = Tot. labor hrs in Corp & UNINCorp sector ≡ Persons Engaged in Prod (PEP)

$= FEE + SEP$ = Full time equiv empl + Self empl. Persons

② ec_γ = avg EC. per Full time equiv employee (does not include SEP's)

$= EC_\gamma / FEE_\gamma$

③ $\boxed{W_\gamma} \equiv ec_\gamma \cdot L_\gamma = ec_\gamma \cdot FEE_\gamma + ec_\gamma \cdot SEP = \boxed{EC_\gamma + SEPWEQ}$

where WEQ = wage equiv of self-empl. persons

But EC includes COS. To be strictly symmetric, we should also split COS into Corp Officer WEQ and "Unearned Income". Thus:

$W = EC + SEPWEQ = [WEC + COS] + SEPWEQ$

WEQ of SEP; Workers' EC

$\boxed{W = WEC + (COWEQ + UNI) + SEPWEQ}$

COWEQ: WEQ of Corp off; UNI: Unearned Income; SEPWEQ: WEQ of SEP

COS

(II) Our ideal measure of Wages & Salaries for NIA book = W'

$W' = WEC + COWEQ + SEPWEQ$

WEC: EC of workers; COWEQ: WEQ of corp officers; SEPWEQ: WEQ of self empl.

If $K_R/W_{T_R} \tilde{=} \text{const}$, $g_{K_R} = g_{WR_p} + g_{L_p}$

Our L.S $= \frac{EC}{PI}$

we want $LS' = \frac{EC + WED - COS}{PI}$

we can est. $WED \equiv (EC) \cdot y$, where $y \equiv \frac{WED}{EC} = \frac{W-EC}{EC}$

from MIA book, G-1

COS can be taken directly from IRS

$$EC \equiv WWS + WOLI + COS + COSOLI$$

Estimate $COS \equiv WWS \cdot y$, $y \equiv \frac{COS}{WS - COS}$ from IRS Stat of Inc

If we assume that OLI % is same for workers + COS $= x$, then

$$EC = WWS(1+x) + COS(1+x) = WSS(1+x) + WWS y(1+x)$$
$$= WSS(1+x)[1+y] = WEC[1+y]$$

$$\rightarrow \boxed{WEC = \frac{EC}{1+y}} \qquad y \equiv \frac{COS}{WSS - COS}$$

IO DOCUMENTATION January 13, ~~2000~~ 1989 (?) (1)

I. Operations on the Real Estate Sector revised

1. Removing Imputed Rentals

A portion of the Real Estate (RE) column consists of imputations made for owner occupied housing sector. This consists of imputed intermediate inputs (m)imp and imputed gross value added (GVA)imp. The so-called intermediate input is simply a column vector of goods purchased by consumers for house repairs, which is actually part of personal consumption (PCE) but is now transferred to rental sector as the "intermediate input" of the imputed rental activities. The corresponding GVA of the imputed rental activities is wholly fictitious, and is added to the GVA of the Real Estate sector.

We need to reverse the above process. This means transferring the intermediate input (m)imp back into the PCE column, and removing (GVA)imp altogether from the GVA of the RE sector. Data for this is derived as follows. .

(i) For 1963, 1967, 1972, 1977, the column vector for the imputed rental sector is directly available from .....

Given the above column vector, the intermediate input component was transferred back to the PCE column, and the GVA component was subtracted from the Value Added row of the RE column. The adjusted tables already reflect this.

[Note: we should save the totals for (m)imp and (GVA)imp for each IO year, because these can be compared to the corresponding data in NIPA]

(ii) For 1958, 1947, (GVA)imp was calculated as the sum of non-farm and farm gross housing products (**NIPA:1929-82**, Table 8.9, lines 86, 94), and total (m)imp was calculated as the corresponding "Intermediate goods and services consumed" (ibid, lines 85, 93). Since we need the imputed intermediate input as a column vector, in order to subtract it out of the intermediate input portion of the RE column and add it to the PCE column, we applied the proportions of (m)imp in 1963 to the total (m)imp for 1958 and 1947.

It is interesting to note that IO and NIPA figures match quite closely, for ~~corresponding~~ years (~~sources as above~~). for instance, in 1972

	IO	NIPA	
(m)imp			
(GVA)imp	65.530	67.0	(Billions of current-$)

(1) ABR adj. arises because of discrepancy between IO and NIPA treatment of RE. (2)

IO DOCUMENTATION January 13, 2000

6/89

(2) ABR adjust is unnecessary in I-O tables, since that is the correct treatment for us
(3) In NIPA, ABR should be shifted from RE to users of rented equip & bldgs
But only a portion of this will show up in deprec of productive sectors —
So we cannot simply subtract it out, as we did

2. ABR of the (Non-Imputed) Real Estate Sector

The basic problem with the real estate sector depreciation arises from an inconsistency between the IO/NIPA treatments of the real estate ~~revenue flows and the IO/BIE treatment~~ sectors. ~~of the~~ corresponding stocks. Real estate revenue flows include revenue derived from buildings and equipment it rents out to other businesses and to consumers. In other words, the RE sector is counted as the recipient of this revenue because it is the **owner** of the buildings and equipment rented out to others. This implies that the amortization ABR of these rented out buildings and equipment is ~~a portion of~~ included in the overall RE sector depreciation. On this **ownership** basis, these rented out buildings and equipment would show up in the capital stock of the RE sector, not in the capital stock of the using (business or residential) sectors. This is the basis on which the BEA capital stock data is calculated (though it is not available at in IO detail).

The trouble is that the IO/BIE capital stock is predicated on a **use** basis, so that the rented out buildings and equipment shows in the capital stock of the sectors which use them, and the amortization of this rented out stock shows up in the depreciation of the using sectors. But, as we have seen, the IO/NIPA revenue flow data includes this same amortization in the RE sector. Since the use basis is generally appropriate, and since only the BIE capital stock is produced in IO detail, we must make the revenue flows consistent with a use basis. This means that we must remove the amortization of buildings and equiptment rented out (ABR) from the value added of the RE sector.

The following steps detail the calculation of ABR.

(i) The BEA capital stock data is on a **owner** basis, so that the corresponding total depreciation of the non-imputed real estate sector (DR') is the depreciation of all building and equipment owned by this sector (i.e. it is the sum of depreciation DR of stock used by this sector, and of amortization ABR of stock rented out to other sectors). Source data are from the BEA, **Fixed Reproducible Tangible Wealth, 1929-85**.

DR' = DR + ABR, and we calculate DR' as

DR' = Deprec of Fixed Priv. Nonres. Capital (Table A2, p. 97)

- Deprec of Fixed Private Resident. Capital (Table A16, pp. 260-262: Total - Fed - State - Owner occupied nonfarm - Owner occupied farm)

File: IODoc.

(3)

For 1972: DR'= 7.796 - (26.007 - 0.144 - 0.372 - 17.222 - 0.954)
= 15.111 bill-$.

(ii) To complete this calculation, we need to estimate DR, which is the depreciation of the buildings and equipment used by the RE for its own use. This can be calculated from the BIE capital stock data, which we noted earlier is on a use basis (so that its depreciation corresponds to the capital used by each sector). [Citation for BIE stock data]

For 1972: DR = 1.150 (bill)

Given DR from the BIE data, and DR' earlier from the BEA data, we can calculate ABR as

For 1972: ABR = DR' - DR = 15.111 - 1.150 = 13.961 (bill)

3. Splitting the Real Estate Sector into GR and BR portions.

The goal here is to split the nonimputed RE sector into a Land Rent and Sale (GR) sector and a Building and Equipment Rent and Sale (BR) sector, because the former will be counted in the Royalty sector and the latter in the Total Trade sector. (See Appendix A for a description of the revenue categories of the real estate sector in IO tables).

We have no direct estimates of either component. But it is worth noting that according to Mary W. Hook of the BEA, the rule of thumb in residential real estate is that land accounts for roughly 1/3 of total revenues. We will see that our calculations yield a somewhat smaller proportion (about 1/4), so that they can be viewed as conservative estimates. A list of sources and telephone contacts is appended at the end of this section.

We begin by noting that because of various redefinitions from other sectors to the real estate and rental sector in IO tables (see Appendix A), the IO and NIPA measures of Real Estate value added differ significantly, and the difference arises essentially from the nonimputed portion. This means that all NIPA data will have to be scaled to IO levels, rather than being used directly. The data below illustrates the problem.

Real Estate Gross Value Added, 1972, Bill-$.

	NIPA	IO
Total	126.1	141.56
Imputed	67	65.53
Nonimputed	59.1	76.03

In what follows, we will consider the total revenue ("gross output" in IO terminology) of the real estate sector to consist of ground rent and land sale (GR) and building and equipment rental and sale: GORE = GR + BR. In turn, GR will be split into two parts: GR = GR1 + GR2, where GR1 = direct payments of royalties and land rent, and GR2 = estimated land rent portion of the total rents paid by tenants of residential and nonresidential buildings.

GORE = GR + BR = 99.014 (from our adjusted tables, bill-$)

GR = GR1 + GR2

(i) GR1 = direct payments of royalties and land rent.

GR1'= farm land rental and royalty payments is calculated directly from NIPA, and this is scaled to IO levels through the ratio of IO/NIPA value added to generate GR1.

1972

Table 8.6: Rental Income of Persons (**NIPA 1929-1982**) (bill-$)

Farms owned by non-operator landlords (mostly land rent, according to Hook, BEA)	2.3
Royalties	1.6
GR1'	3.9

We have already shown the IO and NIPA figures for the value added of the nonimputed real estate sector (see table before this). Their ratio is applied to GR1' to scale it to IO levels.

GR1 ≡ GR1'·(GVAIO/GVANIPA) = (3.9)·(76.03/59.1) = 5.02

(ii) GR2 = land rent component of total rents paid.

There is no direct data for this component. However, Denise McBride of the BEA referred us to data on the proportion of land costs in residential house sales, as shown in The Statistical Yearbook of the U.S. Dept. of Housing and Urban Development, Table 27 (Characteristics of 1-Family Home Transactions), 1979, p. 133. This proportion between land costs and total sale price of new and existing homes can be taken as a proxy for the ratio of land rents to total rents, on the grounds that building and land prices are reflections of their respective rental values. GR2 is then calculated as the product of this

(5)

proportion g2 and that portion of total rental sector revenue which was not previously captured in GR1 above.

1972

New Homes		Existing Homes	
Total Sale Price	24,788	Total Sale Price	19,769
Total Site Price	5,420	Total Site Price	4,306
Site/Sale Price	0.2187	Site/Sale Price	0.2178

All Homes	
Total Sale Price	44,557
Total Site Price	9,706

g2 = Avg. Site/Sale 0.218

GR2 ≡ g2·(GORE - GR1) = 0.218(99.014 - 5.02) = 20.49 bill-$

(iii) Combining the estimates for GR1 and GR2, we get an estimate for GR and for g ≡ GR/GORE.

1972

GR ≡ GR1 + GR2 = 5.02 + 20.49 = 25.51 bill-$

g ≡ GR/GORE = 25.51/99.014 = .2573
= estimated prop. of land rent in the total revenue of the real estate sector.

Telephone Contacts

	Agency/Division	Telephone
Mary W. Hook	BEA/Rental Income	(202) 523-0813
Denise McBride	"	" 523-0812
Wayne Brubaker	Natl Assoc Realtors/Research	" 383-1008
John Gorman	BEA/Cap Stock and Deprec	" 523-0803
Senora Anderson	HUD/Stat Yearbook	" 755-6626

APPENDIX A: THE REAL ESTATE IN INPUT-OUTPUT TABLES

Source: Definitions and Conventions of the 1972 Input-Output Study, BEA, Jul 80

The "gross output" of the nonimputed real estate sector consists of all rents, royalties and commissions from real estate activity, even when not engaged in by real estate firms (i.e. even if engaged in by other businesses, persons, or by government). This includes "the real estate activity of operative builders", which is redefined from construction to real estate, and the "Royalty receipts of writers"(p. 67, and p. A-22)

1. All rents on building/equipment and on land.

2. All royalty payments

3. Commissions on all rentals and royalties above. In our terminology, these are either gross trading margins on rental or sale of buildings, or royalty payments on rental or sale of land. In IO terminology, these are "Net receipts of real estate firms from property management and from sales of property".(A-22)

Summary I-O Tables 8x11 (6/22/89)

1947	PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ----> Govt	Hsehld	ROW	<---------- FINAL DEMAND ----------> CON	I	X-M	G	GROSS PRODUCT	
PRODUCTION	163117.4	15491.2	3010.7	-	-	-	110254.8	~~20943.1~~ 18764.6	8438.4	9104.4	~~330360.0~~ 327881.5 (-ABR)	330360.0
TOTAL TRADE	15705.2	4471.3	990.5	-	-	-	42639.6	2569.2	1444.6	499.8	68320.1	68320.1
ROYALTIES	6183.3	3040.1	2726.1	-	-	-	5721.4	45.7	53.3	143.5	17913.4	17913.4
DUMMY SECTORS Govt Ind	-	-	-	-	-	-	-	-	-	16220.6	16220.6	16220.6
Hsehld Ind	-	-	-	-	-	-	2348.0	-	-	-	2348.0	2348.0
ROW Ind	-	-	-	-	-	-	-718.0	-	1592.0	-50.0	824.0	824.0
VALUE ADDED (W/IVA)	145354.2	~~45317.5~~ 49839.0	11186.1	16220.6	2348.0	824.0	-	-1527.9	-	-	VA 219722.5	FD 219722.5
GROSS OUTPUT	330360.1	~~68320.1~~ 65841.6	17913.4	16220.6	2348.0	824.0	160245.9	22030.1	11528.3	25918.2	GO 435986.2	655708.7 = GO+GFD
	330360.1	~~68320.1~~ (-ABR)	17913.4		2348.0		160245.9	22030.1	11528.3	25918.2	GP 435986.2	

ABR Adjustment

1. Subtract ABR from (GROD, I) and (VA, Tot Trade) → Reduces GP_P by ABR; Reduces GO_{TT} by ABR; Reduces I by ABR → FD ↓ by ABR; or Reduces VA_{BR} by ABR → VA ↓ by ABR
   — But now $GO_P > GP_P$ and $GO_{tt} < GP_{tt}$

2. Rebalance Tables

7/1/89 This must be done before BR is aggregated up to tot trade

(i) Shift a sum = ABR from total trade now to prod now. This will
   a) Raise GP_P by ABR, so now $GO_P = GP_P$
   b) Lower GP_{tt} by ABR, so now $GO_{tt} = GP_{tt}$ ✓
   c) leave VA = FD, both down by ABR in previous step
(ii) Since we have no other info. on margins of BR sector, we use margins of ~~total~~ before trade (~~including~~ BR) to unbundle BR

(M.R.

1958	PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ---->			<--------- FINAL DEMAND ---------->				GROSS OUTPUT	
				Govt	Hsehld	ROW	CON	I	X-M	G		
PRODUCTION	274137.6	24792.1	7403.5	-	-	-	188816.9	36215.0	-3795.6	51134.2	578703.7	578703.7
TOTAL TRADE	32332.9	7625.5	3273.3	-	-	-	69783.2	4037.5	2216.2	1195.7	120464.2	120464.2
ROYALTIES	16506.2	7247.4	7785.8	-	-	-	14046.9	103.7	295.6	1043.3	47029.0	47029.0
DUMMY SECTORS Govt Ind	-	-	-	-	-	-	-	-	-	40693.8	40693.8	
DUMMY SECTORS Hsehld Ind	-	-	-	-	-	-	3503.0	-	-	-	3503.0	3503.0
DUMMY SECTORS ROW Ind	-	_	-	-	-	-	-1152.8	-	3489.8	-307.0	2030.0	
VALUE ADDED (W/IVA)	255726.9	80799.3	28566.4	40693.8	3503.0	2030.0	-	-622.0	-	-	410697.5	410697.5
GROSS OUTPUT	578703.7	120464.2	47029.0	40693.8	3503.0	2030.0	274997.2	39734.2	2206.0	93760.1	792423.7	1203121.2
	578703.7	120464.2	47029.0	40693.8	3503.0	2030.0	274997.2	39734.2	2206.0	93760.1	792423.7	

1963		PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ---->			<-------- FINAL DEMAND ---------->				GROSS OUTPUT	
					Govt	Hsehld	ROW	CON	I	X-M	G		
PRODUCTION		345475.4	28535.6	10712.1	-	-	-	242326.2	52613.6	-2712.7	61868.8	738819.0	738819.0
TOTAL TRADE		38938.8	11115.7	4148.0	-	-	-	89775.2	5429.3	2851.4	1242.5	153501.0	153501.0
ROYALTIES		21665.1	8203.0	10476.8	-	-	-	21067.4	119.8	389.3	3380.6	65302.0	65302.0
DUMMY SECTORS	Govt Ind	-	-	-	-	-	-	-	-	-	57348.8	57348.8	57348.8
	Hsehld Ind	-	-	-	-	-	-	3824.0	-	-	-	3824.0	3824.0
	ROW Ind	-	-	-	-	-	-	-1381.9	-	5284.0	-643.1	3259.0	3259.0
VALUE ADDED (w/IVA)		332739.7	105645.7	39965.2	57348.8	3824.0	3259.0	-	-1004.0	-	-	541779.3	541778.4
GROSS OUTPUT		738819.0	153500.1	65302.1	57348.8	3824.0	3259.0	355610.9	57158.7	5812.0	123197.6	1022053.0	1022053.8
		738819.0	153500.1	65302.1	57348.8	3824.0	3259.0	355610.9	57158.7	5812.0	123197.6	1022053.8	

1967	PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ---->			<-------- FINAL DEMAND ---------->				GROSS OUTPUT	
				Govt	Hsehld	ROW	CON	I	X-M	G		
PRODUCTION	437069.2	38120.3	15252.6	-	-	-	298998.1	87022.4	-7378.6	87564.7	956648.7	956648.7
TOTAL TRADE	52309.9	15497.7	6075.7	-	-	-	119316.8	7230.4	4314.2	2322.9	207067.6	207067.6
ROYALTIES	32979.7	12181.8	16221.7	-	-	-	31125.4	208.1	771.2	5009.3	98497.1	98497.1
DUMMY SECTORS Govt Ind	-	-	-	-	-	-	-	-	-	85083.0	85083.0	
DUMMY SECTORS Hsehld Ind	-	-	-	-	-	-	4701.0	-	-	-	4701.0	4701.0
DUMMY SECTORS ROW Ind	-	_	-	-	-	-	-2047.4	-	7425.3	-860.9	4517.0	
VALUE ADDED (W/IVA)	434291.1	141267.3	60946.7	85083.0	4701.0	4517.0	-	-3686.0	-	-	727119.9	727120.0
GROSS OUTPUT	956649.8	207067.1	98496.8	85083.0	4701.0	4517.0	452094.0	90774.9	5132.0	179119.0	1356514.6	1356514.6
	956649.8	207067.1	98496.8	85083.0	4701.0	4517.0	452094.0	90774.9	5132.0	179119.0	1356514.5	

1972		PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ---->			<-------- FINAL DEMAND ---------->				GROSS PRODUCT	
					Govt	Hsehld	ROW	CON	I	X-M	G		
PRODUCTION		619148.1	54809.2	22725.3	-	-	-	468702.7	127993.8	-22509.0	101767.3	1372637.4	1372637.4
TOTAL TRADE		78676.1	22853.4	9696.4	-	-	-	181973.3	10837.9	7046.5	2982.2	314065.8	314065.8
ROYALTIES		54094.4	17524.9	28891.4	-	-	-	50171.5	249.3	1411.4	10872.7	163215.6	163215.6
DUMMY SECTORS	Govt Ind	-	-	-	-	-	-	-	-	-	137400.0	137400.0	137400.0
	Hsehld Ind	-	-	-	-	-	-	5349.0	-	-	-	5349.0	5349.0
	ROW Ind	-	-	-	-	-	-	-3524.4	-	10645.8	-203.3	6918.1	6918.1
VALUE ADDED (w/IVA)		620719.3	218878.0	101902.4	137400.0	5349.0	6918.1		-15182.0			1075984.7	1075984.7
GROSS OUTPUT		1372637.9	314065.5	163215.4	137400.0	5349.0	6918.1	702672.1	123899.0	-3405.3	252819.0	1999585.9	1999586.0
		1372637.9	314065.5	163215.4	137400.0	5349.0	6918.1	702672.1	123899.0	-3405.3	252819.0	1999586.0	

1977		PRODUCTION	TOT TRADE	ROYALTIES	<---- DUMMY SECTORS ---->			<-------- FINAL DEMAND ---------->				GROSS PRODUCT	
					Govt	Hsehld	ROW	CON	I	X-M	G		
PRODUCTION		1178165.0	97257.3	44041.6	-	-	-	771824.0	216650.2	-52853.3	154507.3	2409592.0	2409592.0
TOTAL TRADE		130444.1	37337.5	17270.6	-	-	-	288053.6	19788.0	13640.5	2362.0	508896.4	508896.4
ROYALTIES		99881.2	29973.2	54499.5	-	-	-	80449.3	521.7	3215.9	23180.9	291721.6	291721.6
DUMMY SECTORS	Govt Ind	-	-	-	-	-	-	-	-	-	241465.1	241465.1	241465.1
	Hsehld Ind	-	-	-	-	-	-	5930.0	-	-	-	5930.0	5930.0
	ROW Ind	-	-	-	-	-	-	-7233.0	-	32015.6	-697.8	24084.8	24084.8
VALUE ADDED (W/IVA)		999264.8	345598.3	178308.4	214465.1	5930.0	24084.8	-	2021.6	-	-	(VA) 1794841.6	(FD) 1769673.0
GROSS OUTPUT		2407755.1	510166.3	294120.0	214465.1	5930.0	24084.8	1139023.9	238981.5	-3981.4	420817.5	(GO) 3456521.4	(GP) 3481690.0
		2407755.1	510166.3	294120.0	214465.1	5930.0	24084.8	1139023.9	238981.5	-3981.4	420817.5	3481690.0	

1947

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
76.Scrap	0	0	0	0	0	0	0	0
77.Govern	0	0	0	0	0	9389.021	6831.614	16220.63
78.Rest o	-718	0	0	1837	-245	-50	0	824
79.Househ	2348	0	0	0	0	0	0	2348
80.Invent	0	0	-763.965	0	0	0	0	-763.965
81.Value	0	0	0	0	0	0	0	226467.2
82.Totals	165443.8	24038.79	-461.993	19865.01	-8336.70	13375.89	12542.37	667670.2
	165443.8	24038.79	-461.992	19865.01	-8336.70	13375.89	12542.37	667670.2

1958

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
77.Govern	0	0	0	0	0	20355.76	20338.07	40693.84
78.Rest o	-1152.79	0	0	4019.799	-530	-307	0	2029.999
79.Househ	3503	0	0	0	0	0	0	3503
80.Invent	0	0	-311	0	0	0	0	-311
81.Value	0	0	0	0	0	397.611	0	423529.5
82.Totals	286111.5	42545.24	-1490.99	23483.11	-21277.1	53593.70	40563.99	1227765.
	286111.5	42545.24	-1490.99	23483.11	-21277.1	53593.70	40564.00	1227765.

1963

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
77.Govern	0	0	0	0	0	24932.83	32415.96	57348.79
78.Rest o	-1381.89	0	0	6208	-924	-643.1	0	3259.000
79.Househ	3824	0	0	0	0	0	0	3824
80.Invent	0	0	-502	0	0	0	0	-502
81.Value	0	0	0	0	0	0	0	556980.2
82.Totals	371015.7	51626.75	5328.997	32450.01	-26638.0	64115.39	59082.22	1593231.
	371015.7	51626.75	5328.997	32450.02	-26638.0	64115.39	59082.22	1593231.

1967

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
77.Govern	0	0	0	0	0	35891.09	49191.90	85083.00
78.Rest o	-2047.39	0	0	9188.299	-1763	-860.9	0	4516.999
79.Househ	4701	0	0	0	0	0	0	4701
80.Invent	0	0	-1843	0	0	0	0	-1843
81.Value	0	0	0	0	0	0	0	750775.9
82.Totals	473898.9	82591.89	10034.00	45923.39	-40791.4	90804.00	88314.99	2127260.
	473898.9	82591.89	10034.00	45923.39	-40791.4	90804.00	88314.99	2127260.

1972

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
77.Govern	0	0	0	0	0	50100.00	87300.00	137400.0
78.Rest o	-3524.39	0	0	14167	-3521.2	-203.3	0	6918.100
79.Househ	5349	0	0	0	0	0	0	5349
80.Invent	0	0	-7591	0	0	0	0	-7591
81.Value	0	0	0	0	0	0	0.0001	1117235.
82.Totals	736353.4	121118.8	10349.69	72793.49	-76198.7	102125.9	150692.9	3142890.
	736353.4	121118.8	10349.69	72793.49	-76198.7	102125.9	150692.9	3142890.

1977

	PCE	INV	CBI	EXPORT	IMPORT	STATE	FED GOVT.	TOTALS
77.Govern	0	0	0	0	0	66318.58	148146.5	214465.1
78.Rest o	-7233	0	0	41133	-9117.39	-697.8	0	24084.80
79.Househ	5930	0	0	0	0	0	0	5930
80.Invent	0	0	-8297.89	0	0	0	0	-8297.89
81.Value	0	0	0	0	0	0	0.0002	1829463.
82.Totals	1190381.	205251.3	23007.59	182747.8	-186729.	143446.2	250371.2	5326809.
	1190381.	205251.3	23007.59	182747.8	-186729.	143446.2	250371.2	5326809.

DUMMY INDUSTRIES

Household

~~Govt~~

ROW

(They only have entries in FD)

[For insertion in 6x9 tables, Paul Conway]

From: "Input-Output Tables, 82x88, LOTUS", 11/88

(Paul Conway)

6/21/89

HH ~~Govt~~ Fed Column entry in VA row was wrong in 1977 table

Old	Correct
5864	5930

— Fix in 82x88 table

	PRODUCTION	TOT TRADE	ROYALTIES	<--- DUMMY SECTORS ---->			<------ GROSS FINAL DEMAND -------->				GROSS PRODUCT
				Govt	Hsehld	ROW	CON	I	X-M	G	
PRODUCTION	xx	xx	xx	-	-	-	xx	xx	xx	xx	GPp
	Mp'	Mtt'	Mry'								TP*
TOTAL TRADE	xx	xx	xx	-	-	-	xx	xx	xx	xx	GPtt
ROYALTIES	RYp	RYtt	RYry	-	-	-	RYcon	RYi	RYx-m	RYg	GPry
DUMMY SECTORS Govt Ind	-	-	-	-	-	-	-	-	-	Wg	
DUMMY SECTORS Hsehld Ind	-	-	-	-	-	-	HHcon	-	-	-	GPdy
DUMMY SECTORS ROW Ind	-	_	-	-	-	-	ROWcon	-	ROWx-m	ROWg	
GROSS VALUE ADDED	VAp	VAtt	VAry	<-------- VAdy --------->			IVA				
GROSS OUTPUT	GOp	GOtt	GOry	<-------- GOdy --------->							
	<------- TV* ------->										

Value Rate & Money Rate of S.V. 10/12/89

1. Ara Khanyan's data indicate that ~~value~~ money rate of S.V. is roughly 92-93% of value rate, and that this deviation is mostly due to different ~~rates~~ trading margins.

$$\frac{S^*}{V^*} \cong (.93)\left(\frac{S}{V}\right)$$

2. Since $V \equiv \hat{\lambda}_c \hat{C}_w$ and $V^* \equiv \hat{p}_c \hat{C}_w$; and $\frac{V}{VA\$} = \frac{1}{1+S/V}$ and $\frac{V^*}{VA^*} = \frac{1}{1+S^*/V^*}$, we can write

① $$\frac{V^*/VA^*}{V/L_p} = \frac{(1+S/V)}{(1+S^*/V^*)} = \left(\frac{V^*}{V}\right)\Big/\left(\frac{VA^*}{L_p}\right) = \frac{(\hat{p}_c \hat{C}_w / \hat{\lambda}_c \hat{C}_w)}{(\hat{p}_y \hat{Y} / \hat{\lambda}_y \hat{Y})}$$

② $$\therefore \frac{(1+S/V)}{(1+S^*/V^*)} \cong \frac{(p_c/\lambda_c)}{(p_y/\lambda_y)}$$

(I) The ratio (V^*/V) can be thought of as the avg. price-value deviation of workers consumer goods (Dept II A) and the ratio $\left(\frac{VA^*}{L_p}\right)$ can be thought of as the average price-value deviation of net output.

(II) Thus if $\bar{p}_c/\bar{\lambda}_c \cong \bar{p}_y/\bar{\lambda}_y$, then $S/V \cong S^*/V^*$, so no separate adjustment is necessary.
(This is the basis of the Foley/Lipietz "trick" of redefining $V = \frac{V^*}{(VA^*/L_p)}$ so that $S' \equiv L_p - V = \frac{S^*}{(VA^*/L_p)}$)

(III) Aglietta does not assume this. He assumes only that $\bar{\lambda}_c/\bar{\lambda}_y \cong$ constant → this allows him to approximate trend of (S/V), but not the level, since he has to use index no's.

i.e. $$\frac{1+(\bar{S}/V)}{1+(\bar{S}^*/V^*)} \cong \frac{\bar{V}'}{\bar{w}'} = \left(\frac{\bar{p}_c \bar{C}_w}{\bar{p}_y \bar{Y}}\right)\Big/\left(\frac{\bar{\lambda}_y \bar{Y}}{\bar{\lambda}_c \bar{C}_w}\right) \cong \alpha\left(\bar{p}_c/\bar{p}_y\right) \text{ if } \bar{\lambda}_c/\bar{\lambda}_y \cong \alpha$$

$\left(\frac{\bar{S}}{V}\right) \cong \alpha \frac{\bar{p}_c}{\bar{p}_y}\left(\frac{VA^*}{V^*}\right) = \alpha\left(\frac{V^*R}{VA^*R}\right)$

(iv) could also approximate p_c/λ_c and p_y/λ_y through "Marx's prices of production", with allowance for gross trading margins.

E. G. $p'_{MX} \equiv (c_m + c_d + v) + r\,C_f$ = Marx's producer price

$p_{MX} \equiv p'_{MX} + GTM_v$ = Marxian purchaser price (GTM_v = value trading margin)

$p_{MX} - \lambda = (c+v) + r C_f + GTM - (c+v+s) =$

ABR should be shifted to using sectors. Thus a portion of ABR should be part of Dp → affects S' But this is automatically done

7/3/89

Notes on ABR adjustments

ABR ≡ Amortization of Buildings Rented out by the Real Estate Sector to others for business and residential use.

1. A firm which rents durable commodities to others (e.g. cars) is selling these commodities piecemeal.

- The total revenue from the renting-out of a car over its lifetime must be compared to the purchase cost of the car to the firm, just as the total revenue from the sale of a stapler must cover its purchase cost to the stationary store.

2. The ABR adjustment arises from the recognition that the treatment of equipment rented out should parallel that of any other traded commodity.

- The gross trading margin of the stationary store, which is its IO "gross output", does not include the cost of the stapler, because to do so would involve double counting. In the same way, the gross trading margin of the car rental firm should not include any part of the purchase cost of the car which is rented out.

- This means that even the input-output measures of gross output and gross product (the column and row sums) of the car rental sector should not include the amortization of the car's purchase costs. Naturally, neither the gross value added of this industry, nor its gross investment, should include the amortization of cars rented-out by this sector.

- The exclusion of the amortization of cars from the gross trading margin of the car-rental sector does not imply that this sum has no existence. On the contrary, it is a legitimate part of the costs of the sector which uses the car, where it appears as part of the depreciation of a capital asset (in a business) or of a durable good (in personal consumption), etc. This would make its treatment consistent with that of any other traded good, such as a stapler, sold to businesses or to consumers. It is for this very reason that such costs cannot be also counted in the trading margin of the selling sectors.

3. Actual NIPA and IO measures of the rental sector do not exclude the amortization of buildings and equipment rented out to other sectors. Thus they subsume ABR under overall depreciation in rental sector gross value added, and under overall retirements (which are definitionally equal in magnitude to overall

depreciation) in rental sector gross investment. This means that the rental sector gross output and gross value added are overstated by ABR, as are its gross output and gross investment.

4. The overstatement of rental sector magnitudes ends with (net) value added on the value side, and (net) investment on the product side. This is because these two magnitudes are derived by subtracting overall depreciation from gross value added, and retirements from gross investment, respectively. If we were only concerned with such net measures, we could avoid estimating ABR. But since the gross output of the trade sector GO_{tt} plays a crucial role in our estimate of total value TV^*, and since the building and equipment sector (BR) is a significant portion of the total trade sector, we must estimate ABR directly.

5. The following steps detail the calculation of ABR (see 1/13/89, IO DOCUMENTATION, section 2) attached below,

(i) The BEA capital stock data is on a **owner** basis, so that the corresponding total depreciation of the non-imputed real estate sector (DR') is the depreciation of all building and equipment owned by this sector (i.e. it is the sum of depreciation DR of stock used by this sector, and of amortization ABR of stock rented out to other sectors). Source data are from the BEA, **Fixed Reproducible Tangible Wealth, 1929-85**.

DR' = DR + ABR, and we calculate DR' as

DR' = Deprec of Fixed Priv. Nonres. Capital (Table A2, p. 97)

- Deprec of Fixed Private Resident. Capital (Table A16, pp. 260-262: Total - Fed - State - Owner occupied nonfarm - Owner occupied farm)

For 1972: DR' = 7.796 - (26.007 - 0.144 - 0.372 - 17.222 - 0.954)
= 15.111 bill-$.

(ii) To complete this calculation, we need to estimate DR, which is the depreciation of the buildings and equipment used by the RE for its own use. This can be calculated from the BIE capital stock data, which we noted earlier is on a use basis (so that its depreciation corresponds to the capital used by each sector). [Citation for BIE stock data]

For 1972: DR = 1.150 (bill)

Given DR from the BIE data, and DR' earlier from the BEA data, we can calculate ABR as

For 1972: ABR = DR' - DR = 15.111 - 1.150 = 13.961 (bill)

6. Having calculated ABR, we must use it in both IO and NIPA-based estimates of marxian measures:

i. In the summary IO tables, the building rental sector's gross value added row must be reduced by ABR, and a similar adjustment must be made in the total trade row (which includes BR) of the gross investment column.

ii. In the NIPA-based estimates, ABR must be subtracted from GVA_{br} on the value side, and from I_G on the product side.

But then, when moving to net measures, we must be careful to only subtract the remaining element of BR depreciation -- i.e. only the BR depreciation after deduction of ABR.

1. M's and D's were Normalized by GVA of paying industry (e.g. $Xt \equiv \frac{Mtt}{GVAtt}$);

2. But RY's were Normalized by GVA of receiving industry (e.g. $Xt1 \equiv \frac{RYtt}{GVA(RY)}$, $X_{x-m1} = \frac{RY_{x-m1}}{GVA_{(RY)}}$)
— This was done because otherwise we would have to use column sums in FD for RY_c, RY_i, RY_{x-m}, RY_g, and some of these such as x-m & i

EXTR419 5/30/89

6/27/89

3. ROW has to be split up

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
MPIO	178.8225											306.471		
GVAPIO	145.3509											255.723		
XP	1.230281	1.227	1.224	1.222	1.219	1.216	1.213	1.210	1.207	1.204	1.201	1.198	1.190	1.181
GVAPNIPA (move data)	140.8	161.7	154.4	174	200.7	209.2	221.5	216	237.9	251.7	261.9	257	281.5	291
MP' (copy MPIO's as a new data row)	173.2236	198.4685	189.0617	212.5582	244.5940	254.3475	268.6609	261.3648	287.1757	303.1057	314.6309	308.0005	334.9322	343.7232
RYPIO	6.183308											16.50619		
GVARYIO	11.1861											28.56639		
XP1	0.552767	0.555044	0.557321	0.559599	0.561876	0.564154	0.566431	0.568708	0.570986	0.573263	0.575541	0.577818	0.570674	0.563530
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RYP'	6.534512	7.514830	8.212872	9.063131	10.10271	11.20116	12.52298	13.56960	14.72590	16.18776	17.60552	19.04445	20.80041	21.88840
MTTIO	19.9625											32.41751		
GVATTIO	49.80557											89.89465		
XT	0.400808	0.397154	0.393500	0.389847	0.386193	0.382539	0.378885	0.375231	0.371578	0.367924	0.364270	0.360616	0.356467	0.352317
GVATTNIPA (move data)	49.70003	54.58735	54.27287	58.33174	64.02938	66.45190	68.53243	70.30302	76.51250	81.11209	85.58216	87.65546	95.36877	98.24347
MTT'	19.92019	21.67962	21.35642	22.74046	24.72772	25.42047	25.96596	26.37993	28.43037	29.84311	31.17505	31.61002	33.99583	34.61291
RYTTIO	3.040083	3.429132	3.505992	3.872033	4.364223	4.647637	4.915149	5.167287	5.759890	6.250543	6.747360	7.247387	7.492087	7.515366
GVARYIO	11.1861											28.56639		
XT1	0.271773	0.270130	0.268487	0.266845	0.265202	0.263559	0.261916	0.260274	0.258631	0.256988	0.255346	0.253703	0.244013	0.234323
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RYtt'	3.212756	3.657337	3.956521	4.321756	4.768420	5.232923	5.790607	6.210240	6.670181	7.256822	7.810912	8.361863	8.894006	9.101499
RYCIO	5.721446											14.04691		
GVARYIO	11.1861											28.56639		
XC	0.511478	0.509682	0.507887	0.506091	0.504296	0.502501	0.500705	0.498910	0.497114	0.495319	0.493523	0.491728	0.498811	0.505894
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RYC'	6.046417	6.900671	7.484389	8.196539	9.067406	9.977057	11.06988	11.90418	12.82073	13.98678	15.09666	16.20699	18.18109	19.64973
RYIIO	0.045663											0.103730		
GVARYIO	11.1861											28.56639		
XI	0.004082	0.004041	0.004000	0.003959	0.003918	0.003877	0.003836	0.003795	0.003754	0.003713	0.003672	0.003631	0.003504	0.003377
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RYI'	0.048257	0.054714	0.058948	0.064122	0.070450	0.076981	0.084812	0.090554	0.096821	0.104853	0.112330	0.119681	0.127734	0.131196
RYGIO	0.143473											1.043319		
GVARYIO	11.1861											28.56639		

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
XG	0.012826	0.014980	0.017134	0.019288	0.021442	0.023597	0.025751	0.027905	0.030059	0.032214	0.034368	0.036522	0.046135	0.055749
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RYG'	0.151622	0.202819	0.252499	0.312395	0.385550	0.468517	0.569327	0.665839	0.775253	0.909659	1.051311	1.203756	1.681595	2.165376
RY(X-M)IO	0.053320											0.295629		
GVARYIO	11.1861											28.56639		
X(X-M)	0.004766	0.005274	0.005781	0.006289	0.006796	0.007304	0.007811	0.008318	0.008826	0.009333	0.009841	0.010348	0.010227	0.010105
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
RY(X-M)'	0.056349	0.071407	0.085200	0.101857	0.122204	0.145020	0.172701	0.198494	0.227637	0.263570	0.301043	0.341090	0.372763	0.392502
DPIO	8.1908											19.8184		
GVAPIO	145.3509											255.723		
XDP	0.056351	0.058274	0.060196	0.062119	0.064041	0.065964	0.067886	0.069809	0.071731	0.073654	0.075576	0.077499	0.076179	0.074859
GVAPNIPA														
DP'	7.934348	9.422970	9.294401	10.80877	12.85320	13.79975	15.03694	15.07882	17.06501	18.53881	19.79358	19.91734	21.44445	21.78399
DTTIO	0.9833											2.6243		
GVATTIO	49.80557											89.89465		
XDTT	0.019742	0.020601	0.021461	0.022320	0.023179	0.024038	0.024897	0.025756	0.026615	0.027474	0.028333	0.029193	0.029176	0.029159
GVATTNIPA														
DTT'	0.981216	1.124602	1.164750	1.301971	1.484152	1.597394	1.706284	1.810766	2.036434	2.228540	2.424880	2.558931	2.782513	2.864744
DRYIO	0.4089											0.8952		
GVARYIO ✓	11.1861											28.56639		
XDRY	0.036554	0.036080	0.035605	0.035131	0.034657	0.034183	0.033708	0.033234	0.032760	0.032286	0.031811	0.031337	0.030678	0.030019
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
DRY'	0.432125	0.488493	0.524698	0.568981	0.623148	0.678697	0.745252	0.792988	0.844897	0.911689	0.973107	1.032860	1.118191	1.165994
g=GR/(GO)re	0.274678	0.273700	0.272723	0.271746	0.270769	0.269792	0.268814	0.267837	0.266860	0.265883	0.264906	0.263929	0.267882	0.271835
MRYIO	4.001168											10.67677		
GVARYIO ✓	11.1861											28.56639		
XMR	0.357691	0.359151	0.360611	0.362071	0.363531	0.364991	0.366452	0.367912	0.369372	0.370832	0.372292	0.373752	0.373367	0.372981
GVARYNIPA	11.82145	13.53914	14.73631	16.19575	17.98030	19.85479	22.10856	23.86037	25.79029	28.23790	30.58952	32.95922	36.44881	38.84152
MR'(1978-87 as residual MR'=Sum(RYj)-GVARYNI	4.228429	4.862602	5.314084	5.864021	6.536412	7.246840	8.101728	8.778523	9.526221	10.47153	11.38825	12.31860	13.60879	14.48718

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Checking balance condition														
M'ry+GVARYNIPA=	16.04988	18.40175	20.05040	22.05977	24.51672	27.10163	30.21029	32.63890	35.31651	38.70943	41.97777	45.27782	50.05761	53.32871
RY'p+RY'tt+RY'c+RY'i+RY'(x-m)+RY'g	16.04991	18.40178	20.05043	22.05980	24.51674	27.10166	30.21031	32.63892	35.31653	38.70945	41.97778	45.27783	50.05761	53.32871

NIPA based adjustments for the period beyond were done by the following procedure:

1. Up to 1977, data was interpolated between years (1947,1958,1963,1967,1972,1977) using relevant ratios for each variable.

2. For 1978-1987, I-O variables were estimated by:
   a) For all variables except MRY', for 1978-pting the 1977 value of each variable's relevant ratio.
   and using these ratios along with NIPA data te the variable.
   b) For MRY', we use the balancing condition it as a residual
   MRY' = SUM (RYj) - GVARYNIPA

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
MPIO			384.414				489.379					697.824		
GVAPIO			332.745				434.291					620.719		
XP	1.173	1.164	1.155	1.148	1.141	1.134	1.127	1.126	1.126	1.125	1.125	1.124	1.161	1.198
GVAPNIPA (move data)	296.4	319.1	337.3	359.1	392.1	426.6	444.3	484	521	535.4	573.2	635.4	721.1	773.2
MP' (copy MPIO's as a new data row)	347.5427	371.4047	389.6760	412.3083	447.4106	483.7447	500.6572	545.1387	586.5389	602.4691	644.7032	714.3285	837.3980	926.5555
RYPIO			21.6651				32.97967					54.09436		
GVARYIO			39.96517				60.94666					101.9023		
XP1	0.556387	0.549243	0.542099	0.541855	0.541611	0.541367	0.541123	0.539067	0.537012	0.534956	0.532900	0.530845	0.536708	0.542571
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RYP'	23.03336	24.07486	25.30656	27.38874	30.06774	33.59789	37.18285	40.60341	44.92629	48.35380	52.92369	58.15488	65.08451	71.71387
MTTIO			39.65128				53.61801					77.66265		
GVATTIO			116.6663				157.6268					244.123		
XT	0.348168	0.344018	0.339869	0.339941	0.340013	0.340085	0.340157	0.335752	0.331346	0.326940	0.322534	0.318129	0.324644	0.331159
GVATTNIPA (move data)	101.2095	108.3485	113.5564	123.5502	132.4332	142.5710	152.6960	167.6808	181.6266	192.0794	209.9446	230.0882	256.5557	277.6315
MTT'	35.23792	37.27394	38.59435	41.99985	45.02910	48.48638	51.94076	56.29922	60.18135	62.79858	67.71448	73.19778	83.28934	91.94030
RYTTIO	7.533589	7.841602	8.203048	8.902368	9.773200	10.76977	12.18176	12.77447	13.63730	14.21104	15.30208	17.52492	18.74130	20.63137
GVARYIO			39.96517				60.94666					101.9023		
XT1	0.224634	0.214944	0.205254	0.203910	0.202565	0.201220	0.199875	0.194296	0.188716	0.183136	0.177557	0.171977	0.171201	0.170425
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RYtt'	9.299431	9.421622	9.581815	10.30688	11.24548	12.48797	13.73429	14.63468	15.78797	16.55342	17.63364	18.84040	20.76092	22.52579
RYCIO			21.06742				31.1254					50.17152		
GVARYIO			39.96517				60.94666					101.9023		
XC	0.512978	0.520061	0.527144	0.523033	0.518921	0.514810	0.510699	0.507029	0.503359	0.499689	0.496019	0.492349	0.484115	0.475881
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RYC'	21.23631	22.79574	24.60842	26.43734	28.80811	31.94972	35.09226	38.19020	42.11088	45.16603	49.26087	53.93757	58.70679	62.89926
RYIIO			0.119798				0.208059					0.249293		
GVARYIO			39.96517				60.94666					101.9023		
XI	0.003251	0.003124	0.002997	0.003101	0.003205	0.003309	0.003413	0.003220	0.003026	0.002833	0.002639	0.002446	0.002542	0.002638
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RYI'	0.134586	0.136946	0.139933	0.156775	0.177964	0.205406	0.234576	0.242559	0.253224	0.256102	0.262172	0.268006	0.308287	0.348685
RYGIO			3.380598				5.00931					10.87273		
GVARYIO			39.96517				60.94666					101.9023		

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
XG	0.065362	0.074975	0.084588	0.083989	0.083390	0.082790	0.082191	0.087092	0.091994	0.096895	0.101796	0.106697	0.111358	0.116020
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RYG'	2.705871	3.286381	3.948808	4.245345	4.629432	5.138100	5.647735	6.559968	7.696196	8.758193	10.10965	11.68887	13.50406	15.33488
RY(X-M)IO			0.389251				0.771182					1.41135		
GVARYIO			39.96517				60.94666					101.9023		
X(X-M)	0.009983	0.009861	0.009739	0.010468	0.011196	0.011924	0.012653	0.012892	0.013132	0.013371	0.013610	0.013850	0.014687	0.015524
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
RY(X-M)'	0.413294	0.432260	0.454676	0.529126	0.621582	0.740078	0.869467	0.971099	1.098623	1.208615	1.351712	1.517291	1.781048	2.051896
DPIO			23.5912				28.8111					43.2481		
GVAPIO			332.745				434.291					620.719		
XDP	0.073538	0.072218	0.070898	0.069759	0.068619	0.067480	0.066340	0.067007	0.067673	0.068340	0.069007	0.069674	0.072665	0.075656
GVAPNIPA														
DP'	21.79694	23.04501	23.91411	25.05049	26.90573	28.78698	29.47508	32.43149	35.25813	36.58960	39.55506	44.27096	52.39883	58.49730
DTTIO			3.3961				3.8982					6.0713		
GVATTIO			116.6663				157.6268					244.123		
XDTT	0.029142	0.029126	0.029109	0.028014	0.026920	0.025825	0.024730	0.024758	0.024786	0.024814	0.024841	0.024869	0.025528	0.026186
GVATTNIPA														
DTT'	2.949542	3.155785	3.305574	3.461234	3.565109	3.681940	3.776258	4.151513	4.501848	4.766284	5.215441	5.722257	6.549354	7.270105
DRYIO			1.1207				1.53495					2.92818		
GVARYIO			39.96517				60.94666					101.9023		
XDRY	0.029360	0.028701	0.028041	0.027327	0.026613	0.025899	0.025185	0.025895	0.026605	0.027315	0.028025	0.028735	0.030215	0.031695
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
DRY'	1.215454	1.258046	1.309067	1.381312	1.477459	1.607342	1.730576	1.950461	2.225779	2.468969	2.783247	3.147979	3.664116	4.189369
g=GR/(GO)re	0.275789	0.279742	0.283696	0.284928	0.286161	0.287394	0.288627	0.290297	0.291967	0.293638	0.295308	0.296979	0.295114	0.293249
MRYIO			14.86007				21.32837					32.42166		
GVARYIO			39.96517				60.94666					101.9023		
XMR	0.372596	0.372210	0.371825	0.366356	0.360888	0.355419	0.349951	0.343593	0.337236	0.330879	0.324521	0.318164	0.323302	0.328440
GVARYNIPA	41.39809	43.83279	46.68251	50.54621	55.51533	62.06115	68.71417	75.32152	83.65971	90.38827	99.31244	109.5514	121.2660	132.1741
MR'(1978-87 as residual MR'=Sum(RYj)-GVARYNI	15.42478	16.31504	17.35774	18.51795	20.03484	22.05777	24.04662	25.88001	28.21311	29.90758	32.22903	34.85534	39.20560	43.41132

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Checking balance condition														
M'ry+GVARYNIPA=	56.82288	60.14783	64.04025	69.06417	75.55018	84.11892	92.76080	101.2015	111.8728	120.2958	131.5414	144.4068	160.4716	175.5854
RY'p+RY'tt+RY'c+RY'i+RY'(x-m)+RY'g	56.82287	60.14782	64.04023	69.06422	75.55032	84.11918	92.76119	101.2019	111.8731	120.2961	131.5417	144.4070	160.1456	174.8744

NIPA based adjustments for the period beyond
1. Up to 1977, data was interpolated between

2. For 1978-1987, I-O variables were estimat
 a) For all variables except MRY', for 1978-
and using these ratios along with NIPA data
 b) For MRY', we use the balancing condition
 MRY' = SUM (RYj) - GVARYNIPA

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
MPIO			1308.609											
GVAPIO			999.305											
XP	1.235	1.272	1.310	1.310	1.310	1.310	1.310	1.310	1.310	1.310	1.310	1.310	1.309519	
GVAPNIPA (move data)	828.7	933.1	1044.1	1180.5	1306.2	1413.7	1587.1	1614.8	1707.2	1907	1999.7	2034.7	2144.8	
MP' (copy MPIO's as a new data row)	1023.775	1187.331	1367.268	1545.887	1710.493	1851.267	2078.337	2114.611	2235.611	2497.252	2618.645	2664.478	2808.656	
RYPIO			99.88122											
GVARYIO			178.3083											
XP1	0.548434	0.554297	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	0.560160	
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RYP'	78.68883	89.44822	106.4281	125.4366	143.4514	160.9228	182.0016	192.0453	224.3161	247.2435	284.6286	328.6236	366.1431	
MTTIO			134.5948											
GVATTIO			383.7839											
XT	0.337674	0.344189	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	0.350704	
GVATTNIPA (move data)	305.7704	336.1277	374.4779	421.62	467.13	490.28	554.04	581.09	627.48	708.84	764.28	811.74	864.26	
MTT'	103.2508	115.6916	131.3311	147.8640	163.8246	171.9434	194.3044	203.7909	220.0601	248.5934	268.0365	284.6809	303.1000	
RYTTIO	23.10843	25.82699	29.973	33.45950	37.65980	40.14397	46.06280	49.04399	54.07622	62.34956	68.58648	74.29044	80.63545	
GVARYIO			178.3083											
XT1	0.169648	0.168872	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	0.168096	
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RYtt'	24.34107	27.25138	31.93763	37.64184	43.04783	48.29076	54.61623	57.63020	67.31424	74.19443	85.41319	98.61548	109.8745	
RYCIO			80.44928											
GVARYIO			178.3083											
XC	0.467648	0.459414	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.451180	0.0752
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RYC'	67.09771	74.13677	85.72247	101.0329	115.5428	129.6152	146.5931	154.6828	180.6753	199.1421	229.2539	264.6897	294.9098	
RYIIO			0.521656											
GVARYIO			178.3083											
XI	0.002733	0.002829	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.002925	0.0012
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RYI'	0.392259	0.456643	0.555849	0.655127	0.749214	0.840463	0.950553	1.003008	1.171552	1.291296	1.486550	1.716326	1.912281	
RYGIO			23.18089											
GVARYIO			178.3083											

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
XG	0.120681	0.125343	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.130004	0.205
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RYG'	17.31530	20.22691	24.70032	29.11191	33.29286	37.34770	42.23977	44.57075	52.06032	57.38140	66.05791	76.26846	84.97617	0
RY(X-M)IO			3.215867											
GVARYIO			178.3083											
X(X-M)	0.016361	0.017198	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.018035	0.0257
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
RY(X-M)'	2.347499	2.775337	3.426656	4.038674	4.618693	5.181218	5.859891	6.183267	7.222288	7.960478	9.164163	10.58066	11.78867	0
DPIO			84.5702											
GVAPIO			999.305											
XDP	0.078647	0.081638	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.084629	0.1175
GVAPNIPA														
DP'	65.17483	76.17646	88.36115	99.90455	110.5424	119.6400	134.3147	136.6589	144.4786	161.3875	169.2326	172.1946	181.5123	
DTTIO			10.8076											
GVATTIO			383.7839											
XDTT	0.026844	0.027502	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.028160	0.0354
GVATTNIPA														
DTT'	8.208199	9.244347	10.54553	11.87308	13.15467	13.80659	15.60212	16.36386	17.67023	19.96138	21.52261	22.85911	24.33811	0
DRYIO			6.4435											
GVARYIO			178.3083											
XDRY	0.033176	0.034656	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.036136	0.0495
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
DRY'	4.760086	5.592601	6.865850	8.092124	9.254285	10.38139	11.74122	12.38915	14.47100	15.95008	18.36185	21.20004	23.62048	
g=GR/(GO)re	0.291385	0.289520	0.287656											
MRYIO			61.31218											
GVARYIO			178.3083											
XMR	0.333578	0.338716	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.343854	0.3802
GVARYNIPA	143.4790	161.3723	189.9958	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64	
MR'(1978-87 as residual MR'=Sum(RYj)-GVARYNI	47.86154	54.65950	65.33099	73.98716	84.61292	94.91820	107.3512	113.2753	132.3099	145.8333	167.8844	193.8342	215.9646	

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Checking balance condition														
M'ry+GVARYNIPA=	191.3406	216.0318	255.3268	297.9171	340.7029	382.1982	432.2612	456.1153	532.7599	587.2133	676.0044	780.4942	869.6046	
RY'p+RY'tt+RY'c+RY'i+RY'(x-m)+RY'g	190.1826	214.2952	252.7710	297.9171	340.7029	382.1982	432.2612	456.1153	532.7599	587.2133	676.0044	780.4942	869.6046	

NIPA based adjustments for the period beyond
1. Up to 1977, data was interpolated between

2. For 1978-1987, I-O variables were estimat
a) For all variables except MRY', for 1978-
and using these ratios along with NIPA data
b) For MRY', we use the balancing condition
MRY' = SUM (RYj) - GVARYNIPA

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
TV* = GOp + GOtt + S.D.	395.19	446.31	432.06	481.82	551.62	573.65	605.57	596.53	653.21	687.31	717.50	711.57	773.99	795.77
TP* = U* + C* + I* + G* + (X-M)*	395.09	446.21	431.96	481.62	551.62	573.95	605.37	596.63	652.91	687.21	717.30	711.67	774.29	795.67
TV*/TP*	1.0003	1.0002	1.0002	1.0004	1.0000	0.9995	1.0003	0.9998	1.0005	1.0001	1.0003	0.9999	0.9996	1.0001
GVA* = TV* - Mp	222.0	247.8	243.0	269.3	307.0	319.3	336.9	335.2	366.0	384.2	402.9	403.6	439.1	452.0
D* = Dp + Dtt	8.9	10.5	10.5	12.1	14.3	15.4	16.7	16.9	19.1	20.8	22.2	22.5	24.2	24.6
VA* = GVA* - D*	213.1	237.3	232.5	257.1	292.7	303.9	320.2	318.3	346.9	363.4	380.7	381.1	414.8	427.4
Variable Capital	ERR	88.25	85.16	93.57	106.69	112.22	119.04	113.93	123.05	131.94	135.92	131.33	143.35	148.08
S*	ERR	149.04	147.38	163.58	186.00	191.69	201.13	204.34	223.89	231.50	244.73	249.77	271.48	279.31
S*/V*	ERR	1.69	1.73	1.75	1.74	1.71	1.69	1.79	1.82	1.75	1.80	1.90	1.89	1.89
GFP* = TP* - Mp	221.87	247.74	242.90	269.06	307.03	319.61	336.71	335.26	365.74	384.10	402.67	403.67	439.36	451.95
IR* = D* = Dp + Dtt (IR*=Repl I	8.9	10.5	10.5	12.1	14.3	15.4	16.7	16.9	19.1	20.8	22.2	22.5	24.2	24.6
FP* = GFP* - IR*	212.95	237.19	232.44	256.95	292.69	304.21	319.97	318.37	346.64	363.33	380.46	381.20	415.13	427.30
Surplus Product	ERR	148.94	147.28	163.38	186.00	191.99	200.93	204.44	223.59	231.40	244.53	249.87	271.78	279.21
s/v	ERR	1.69	1.73	1.75	1.74	1.71	1.69	1.79	1.82	1.75	1.80	1.90	1.90	1.89

TV=GOp + GOtt + S.D.
GOp= Mp + RYP'+ GVAp
GOtt= MTT'+ RYTT' + GVAtt

			1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
601	4	Agriculture, forestry, and fishe	20.8	24.0	19.5	20.8	23.9	23.2	21.4	20.8	20.0	19.8	19.6	22.1	20.4	21.7
601	7	Mining	6.8	9.4	8.1	9.3	10.2	10.2	10.7	11.0	12.5	13.6	13.7	12.6	12.5	12.8
601	12	Construction	9.1	11.5	11.5	13.2	15.6	16.9	17.5	17.7	19.1	21.3	22.2	21.8	23.7	24.3
601	13	Manufacturing	66.2	74.7	72.2	84.0	99.0	103.3	112.5	106.7	121.3	127.2	131.8	124.3	141.8	144.4
601	37	Transportation and public utilit	21.0	23.7	23.9	26.6	30.2	32.2	34.2	33.8	36.8	39.6	41.7	41.9	45.1	47.3
		Services (Productive)	14.30	15.60	16.10	17.10	18.40	19.30	20.80	21.70	24.00	26.10	28.10	29.50	32.10	34.30
601	61	Hotels and other lodging place	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.5	2.5	2.7	2.8
601	62	Personal services	2.8	3.1	3.2	3.4	3.6	3.7	3.9	4.0	4.2	4.6	4.9	5.0	5.2	5.4
601	64	Auto repair, services, and gar	0.9	1.0	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.9	2.1	2.2	2.4	2.7
601	65	Miscellaneous repair services	0.7	0.8	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.2	1.3	1.2	1.2	1.3
601	66	Motion pictures	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.2	1.1	1.1	1.1
601	67	Amusement and recreation servi	1.2	1.3	1.3	1.3	1.3	1.4	1.6	1.6	1.7	1.9	2.0	2.1	2.4	2.7
		Total Amusement (motion&am.&re	2.60	2.60	2.60	2.60	2.60	2.60	2.80	2.90	3.00	3.20	3.20	3.20	3.50	3.80
601	68	Health services	3.6	4.1	4.3	4.7	5.2	5.7	6.2	6.4	7.7	8.2	9.0	9.9	11.0	11.5
601	70	Educational services	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.6	1.7	1.9	2.0	2.2
601	71	Social services and membership	1.4	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.9	3.1	3.4	3.6	4.1	4.6
601	72	Miscellaneous professional ser	0.9	1.1	1.1	1.2	1.5	1.8	2.0	2.1	2.4	2.9	3.4	3.5	3.8	4.0
601	73	Private households = Hshld Ind	2.4	2.4	2.4	2.6	2.7	2.6	2.7	2.6	3.1	3.3	3.3	3.5	3.6	3.8

I-A

Procedure to check balance of two sides of accounts	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
GOry=Mry+GVAry	16.05	18.40	20.05	22.06	24.52	27.10	30.21	32.64	35.32	38.71	41.98	45.28	50.06	53.33
GPry=RYp+Rytt+RYc+RYi+RY(x-m)+RYg	16.05	18.40	20.05	22.06	24.52	27.10	30.21	32.64	35.32	38.71	41.98	45.28	50.06	53.33
GOry/GPry	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mry	4.23	4.86	5.31	5.86	6.54	7.25	8.10	8.78	9.53	10.47	11.39	12.32	13.61	14.49
GVAry	11.82	13.54	14.74	16.20	17.98	19.85	22.11	23.86	25.79	28.24	30.59	32.96	36.45	38.84
RY(x-m)	0.06	0.07	0.09	0.10	0.12	0.15	0.17	0.20	0.23	0.26	0.30	0.34	0.37	0.39
RYg	0.15	0.20	0.25	0.31	0.39	0.47	0.57	0.67	0.78	0.91	1.05	1.20	1.68	2.17
RYi	0.05	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.10	0.11	0.12	0.13	0.13
RYc	6.05	6.90	7.48	8.20	9.07	9.98	11.07	11.90	12.82	13.99	15.10	16.21	18.18	19.65
RYtt	3.21	3.66	3.96	4.32	4.77	5.23	5.79	6.21	6.67	7.26	7.81	8.36	8.89	9.10
RYp	6.53	7.51	8.21	9.06	10.10	11.20	12.52	13.57	14.73	16.19	17.61	19.04	20.80	21.89
GVAp+GVAtt+GVAry+GVAir+S.D.+ABR+HH+G	217.60	243.60	240.30	267.20	305.80	319.80	339.30	339.40	371.40	391.10	411.40	413.90	450.80	467.40
C+I+G'+(X-M)	217.50	243.50	240.20	267.00	305.80	320.10	339.10	339.50	371.10	391.00	411.20	414.00	451.10	467.30
	2478.51	2773.50	2890.81	3072.50	3490.31	3693.30	3859.00	4036.60	4297.20	4650.00	4928.31	5085.31	5282.41	5515.00
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
f=(RYp/GVAp)est	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08
x=[(M+RY)tt/GVAtt]	0.47	0.46	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.44
GVA" = GNP-GVAir-HH-Wg-ROW	209.00	233.60	229.50	254.90	291.50	303.90	321.20	319.60	349.10	367.00	384.90	386.10	420.90	434.40
GVA'=GVAp(1+f)+[GVAt+gGVArr'(nonimp)	218.74	244.29	239.34	265.23	302.91	315.02	332.21	330.07	360.49	378.51	396.68	396.88	431.87	444.67
GVA*	221.97	247.84	243.00	269.26	307.03	319.31	336.91	335.16	366.04	384.20	402.87	403.57	439.06	452.05
GNP	235.20	261.60	260.40	288.30	333.40	351.60	371.60	372.50	405.90	428.20	451.00	456.80	495.80	515.30
GVA'/GVA*	0.99	0.99	0.98	0.99	0.99	0.99	0.99	0.98	0.98	0.99	0.98	0.98	0.98	0.98
GNP/GVA*	1.06	1.06	1.07	1.07	1.09	1.10	1.10	1.11	1.11	1.11	1.12	1.13	1.13	1.14
GVA"/GVA*	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96

606 1 Total FT and PT Employees	51407.00	50437.00	52506.00	56499.00	57790.00	59011.00	57484.00	59184.00	60955.00	61424.00	59961.00	61715.00	62817.00	

G7: Lp/L	ERR	0.63	0.60	0.60	0.57	0.55	0.55	0.53	0.52	0.51	0.50	0.48	0.48	0.47
G6: ECp/EC=v*/EC	ERR	0.62	0.60	0.60	0.59	0.57	0.57	0.54	0.54	0.54	0.53	0.51	0.51	0.50
G5: s*/TV*	ERR	0.33	0.34	0.34	0.34	0.33	0.33	0.34	0.34	0.34	0.34	0.35	0.35	0.35
G5: v*/TV*	ERR	0.20	0.20	0.19	0.19	0.20	0.20	0.19	0.19	0.19	0.19	0.18	0.19	0.19
G5: c*/TV*	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.43	0.43	0.43
G4: GVA"/GVA*	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96
G4: GNP/GVA*	1.06	1.06	1.07	1.07	1.09	1.10	1.10	1.11	1.11	1.11	1.12	1.13	1.13	1.14
G3: G/s*=(G'+Wg)/s*	ERR	0.22	0.26	0.24	0.32	0.40	0.41	0.37	0.34	0.34	0.36	0.38	0.36	0.36
G2: m/w=U*/EC	1.5	1.6	1.5	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3
G2: c*/v*	ERR	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
G1: c*+v*=Mp+v*	ERR	286.7	274.2	306.1	351.3	366.6	387.7	375.3	410.2	435.0	450.6	439.3	478.3	491.8

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Procedure to check balance of two sides of accounts														
GOry=Mry+GVAry	56.82	60.15	64.04	69.06	75.55	84.12	92.76	101.20	111.87	120.30	131.54	144.41	160.47	175.59
GPry=RYp+Rytt+RYc+RYi+RY(x-m)+RYg	56.82	60.15	64.04	69.06	75.55	84.12	92.76	101.20	111.87	120.30	131.54	144.41	160.15	174.87
GOry/GPry	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mry	15.42	16.32	17.36	18.52	20.03	22.06	24.05	25.88	28.21	29.91	32.23	34.86	39.21	43.41
GVAry	41.40	43.83	46.68	50.55	55.52	62.06	68.71	75.32	83.66	90.39	99.31	109.55	121.27	132.17
RY(x-m)	0.41	0.43	0.45	0.53	0.62	0.74	0.87	0.97	1.10	1.21	1.35	1.52	1.78	2.05
RYg	2.71	3.29	3.95	4.25	4.63	5.14	5.65	6.56	7.70	8.76	10.11	11.69	13.50	15.33
RYi	0.13	0.14	0.14	0.16	0.18	0.21	0.23	0.24	0.25	0.26	0.26	0.27	0.31	0.35
RYc	21.24	22.80	24.61	26.44	28.81	31.95	35.09	38.19	42.11	45.17	49.26	53.94	58.71	62.90
RYtt	9.30	9.42	9.58	10.31	11.25	12.49	13.73	14.63	15.79	16.55	17.63	18.84	20.76	22.53
RYp	23.03	24.07	25.31	27.39	30.07	33.60	37.18	40.60	44.93	48.35	52.92	58.15	65.08	71.71
GVAp+GVAtt+GVAry+GVAir+S.D.+ABR+HH+G	482.30	519.20	547.50	585.30	635.80	693.50	729.40	794.70	856.40	896.20	972.50	1070.20	1204.60	1304.20
C+I+G'+(X-M)	482.20	519.10	547.50	585.40	635.90	693.60	729.10	794.90	856.50	896.00	972.40	1070.20	1204.30	1304.00
	5692.40	5918.61	6161.00	6503.50	6951.40	7567.81	8189.81	8997.60	10213.61	11232.30	12542.91	13960.30	15778.21	18194.30
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
f=(RYp/GVAp)est	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
x=[(M+RY)tt/GVAtt]	0.44	0.43	0.42	0.42	0.42	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.41	0.41
GVA" = GNP-GVAir-HH-Wg-ROW	447.10	481.00	507.00	542.30	589.80	645.00	677.30	739.50	797.00	832.30	901.30	992.00	1114.90	1204.00
GVA'=GVAp(1+f)+[GVAt+gGVArr'(nonimp)	456.23	489.85	514.79	551.24	599.35	655.21	688.10	750.38	807.43	841.82	909.61	1000.28	1126.94	1220.51
GVA*	463.98	498.22	523.74	560.95	609.68	665.84	699.45	762.12	819.62	854.09	923.22	1014.08	1142.49	1235.31
GNP	533.80	574.60	606.90	649.80	705.10	772.00	816.40	892.70	963.90	1015.50	1102.70	1212.80	1359.30	1472.80
GVA'/GVA*	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99
GNP/GVA*	1.15	1.15	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.19	1.19
GVA"/GVA*	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.98	0.98	0.98	0.97
606 1 Total FT and PT Employees	63024.00	64724.00	65780.00	67447.00	69877.00	73718.00	75658.00	77831.00	80091.00	80003.00	79819.00	81856.00	85484.00	86866.00
G7: Lp/L	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.40	0.40	0.41	0.40
G6: ECp/EC=v*/EC	0.49	0.49	0.48	0.48	0.48	0.48	0.46	0.46	0.46	0.45	0.45	0.46	0.47	0.46
G5: s*/TV*	0.36	0.36	0.36	0.37	0.37	0.37	0.37	0.37	0.36	0.37	0.37	0.37	0.36	0.35
G5: v*/TV*	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19
G5: c*/TV*	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.42	0.43
G4: GVA"/GVA*	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.98	0.98	0.98	0.97
G4: GNP/GVA*	1.15	1.15	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.19	1.19
G3: G/s*=(G'+Wg)/s*	0.37	0.38	0.38	0.37	0.36	0.38	0.40	0.41	0.40	0.41	0.40	0.40	0.38	0.39
G2: m/w=U*/EC	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.2	1.2
G2: c*/v*	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3
G1: c*+v*=Mp+v*	497.6	531.0	556.7	589.1	640.2	695.2	721.4	787.0	853.5	879.1	939.0	1045.7	1216.0	1334.1

		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Procedure to check balance of two sides of accounts														
GOry=Mry+GVAry		191.34	216.03	255.33	297.92	340.71	382.20	432.26	456.12	532.76	587.22	676.01	780.49	869.61
GPry=RYp+Rytt+RYc+RYi+RY(x-m)+RYg		190.18	214.30	252.77	297.92	340.70	382.20	432.26	456.12	532.76	587.21	676.00	780.49	869.60
GOry/GPry		1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mry		47.86	54.66	65.33	73.99	84.61	94.92	107.35	113.28	132.31	145.83	167.88	193.83	215.96
GVAry		143.48	161.37	190.00	223.93	256.09	287.28	324.91	342.84	400.45	441.38	508.12	586.66	653.64
RY(x-m)		2.35	2.78	3.43	4.04	4.62	5.18	5.86	6.18	7.22	7.96	9.16	10.58	11.79
RYg		17.32	20.23	24.70	29.11	33.29	37.35	42.24	44.57	52.06	57.38	66.06	76.27	84.98
RYi		0.39	0.46	0.56	0.66	0.75	0.84	0.95	1.00	1.17	1.29	1.49	1.72	1.91
RYc		67.10	74.14	85.72	101.03	115.54	129.62	146.59	154.68	180.68	199.14	229.25	264.69	294.91
RYtt		24.34	27.25	31.94	37.64	43.05	48.29	54.62	57.63	67.31	74.19	85.41	98.62	109.87
RYp		78.69	89.45	106.43	125.44	143.45	160.92	182.00	192.05	224.32	247.24	284.63	328.62	366.14
GVAp+GVAtt+GVAry+GVAir+S.D.+ABR+HH+G		1410.60	1578.80	1770.00	2009.40	2247.70	2444.00	2736.00	2822.10	3039.50	3381.50	3595.80	3797.00	4053.90
C+I+G'+(X-M)		1410.90	1578.90	1770.00	2009.10	2247.80	2443.80	2735.90	2822.10	3039.30	3381.70	3595.90	3796.80	4054.00
		20650.50	22399.91	24926.21	28242.61	32873.01	37939.00	29450.99	31772.79	34277.63	36979.95	39895.30		
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
f=(RYp/GVAp)est		0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.13	0.13	0.14	0.16	0.17
x=[(M+RY)tt/GVAtt]		0.42	0.43	0.44	0.44	0.44	0.45	0.45	0.45	0.46	0.46	0.46	0.47	0.48
GVA" = GNP-GVAir-HH-Wg-ROW		1305.80	1462.20	1639.40	1858.40	2067.90	2240.40	2506.50	2578.00	2782.60	3110.90	3314.10	3502.80	3745.00
GVA'=GVAp(1+f)+[GVAt+gGVArr'(nonimp)		1329.43	1488.70	1668.71	1888.25	2099.93	2270.27	2534.83	2606.27	2801.48	3136.52	3330.12	3506.45	3738.05
GVA*		1343.25	1505.22	1688.27	1911.17	2122.66	2290.04	2576.17	2649.25	2851.57	3193.57	3395.06	3576.06	3814.78
GNP		1598.40	1782.80	1990.50	2249.70	2508.20	2732.00	3052.60	3166.00	3405.70	3772.20	4014.90	4240.30	4526.70
GVA'/GVA*		0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98
GNP/GVA*		1.19	1.18	1.18	1.18	1.18	1.19	1.18	1.20	1.19	1.18	1.18	1.19	1.19
GVA"/GVA*		0.97	0.97	0.97	0.97	0.97	0.98	0.97	0.97	0.98	0.97	0.98	0.98	0.98
											94.0	91.5		
											125.1	122.8		
606 1 Total FT and PT Employees		85347.00	87708.00	90734.00	95114.00	98076.00	98400.00	99205.00	97832.00	98670.00	103280 ERR	105994 ERR	107932	110798
G7: Lp/L		0.38	0.38	0.38	0.39	0.38	0.38	0.37	0.36	0.36	0.36	0.35	0.34	0.34
G6: ECp/EC=v*/EC		0.44	0.44	0.45	0.45	0.45	0.44	0.44	0.42	0.42	0.43	0.42	0.40	0.39
G5: s*/TV*		0.36	0.35	0.35	0.35	0.34	0.35	0.35	0.36	0.36	0.36	0.37	0.38	0.39
G5: v*/TV*		0.18	0.17	0.17	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16
G5: c*/TV*		0.43	0.44	0.45	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43	0.42
G4: GVA"/GVA*		0.97	0.97	0.97	0.97	0.97	0.98	0.97	0.97	0.98	0.97	0.98	0.98	0.98
G4: GNP/GVA*		1.19	1.18	1.18	1.18	1.18	1.19	1.18	1.20	1.19	1.18	1.18	1.19	1.19
G3: G/s*=(G'+Wg)/s*		0.39	0.38	0.36	0.35	0.35	0.37	0.36	0.38	0.37	0.36	0.37	0.37	0.36
G2: m/w=U*/EC		1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
G2: c*/v*		2.4	2.5	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7
G1: c*+v*=Mp+v*		1444.1	1656.3	1893.6	2147.4	2388.9	2573.1	2866.6	2919.4	3094.2	3445.7	3608.0	3659.2	3861.9

II-A

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
GFP*/GNP	0.94	0.95	0.93	0.93	0.92	0.91	0.91	0.90	0.90	0.90	0.89	0.88	0.89	0.88
TP*/GNP	1.68	1.71	1.66	1.67	1.65	1.63	1.63	1.60	1.61	1.60	1.59	1.56	1.56	1.54
GFP*/TP*	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.57	0.57	0.57
U/TP*	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.49
GVA*/TV*	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.57	0.57	0.57
GOtt/TV*	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18
U/V*	ERR	2.55	2.53	2.58	2.59	2.56	2.54	2.60	2.64	2.60	2.63	2.68	2.67	2.65
S*/V*	ERR	1.69	1.73	1.75	1.74	1.71	1.69	1.79	1.82	1.75	1.80	1.90	1.89	1.89
TP*-Real	17.88	18.91	18.38	20.15	21.98	22.51	23.37	22.69	24.00	24.46	24.65	23.96	25.47	25.75
GNP-Real	10.64	11.08	11.08	12.06	13.28	13.79	14.35	14.16	14.92	15.24	15.50	15.38	16.31	16.68
(GNP-Real/Total FT&PT)=y	ERR	215.63	219.70	229.74	235.10	238.59	243.13	246.39	252.14	249.99	252.32	256.51	264.27	265.48
Total Productive Workers	0.00	32268.77	30488.39	31499.89	32379.93	32006.55	32315.60	30559.55	31067.51	31236.47	30838.83	28802.88	29465.67	29464.75
(TP*-Real/Total Productive Workers)=	ERR	585.93	602.89	639.72	678.72	703.23	723.29	742.34	772.65	782.92	799.31	831.93	864.40	873.92
(Profit/Wage)=(GNP-EC)/EC	0.81	0.84	0.83	0.86	0.84	0.79	0.77	0.78	0.80	0.75	0.75	0.76	0.76	0.74
GOp/TV*	0.81	0.82	0.81	0.82	0.83	0.83	0.83	0.82	0.83	0.83	0.83	0.82	0.82	0.83
GFU*/TP*	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.51	0.51	0.51
GNP	235.2	261.6	260.4	288.3	333.4	351.6	371.6	372.5	405.9	428.2	451.0	456.8	495.8	515.3
Total EC = EC	130102	142086	141998	155417	181595	196349	210420	209367	225915	244740	257758	259756	281244	296664
FEE	47121.00	48097.00	46840.00	48600.00	52612.00	53752.00	54694.00	52868.00	54079.00	55399.00	55825.00	54026.00	55537.00	56541.00
GNP Deflator	22.1	23.6	23.5	23.9	25.1	25.5	25.9	26.3	27.2	28.1	29.1	29.7	30.4	30.9
TV*=GOp+GOtt+S.D.	395.2	446.3	432.1	481.8	551.6	573.7	605.6	596.5	653.2	687.3	717.5	711.6	774.0	795.8
GVA*=TV*-Mp	222.0	247.8	243.0	269.3	307.0	319.3	336.9	335.2	366.0	384.2	402.9	403.6	439.1	452.0
V*	ERR	88.3	85.2	93.6	106.7	112.2	119.0	113.9	123.1	131.9	135.9	131.3	143.4	148.1
S*	ERR	149.04	147.38	163.58	186.00	191.69	201.13	204.34	223.89	231.50	244.73	249.77	271.48	279.31
TP*=U*+C*+I*+G*+(X-M)	395.1	446.2	432.0	481.6	551.6	574.0	605.4	596.6	652.9	687.2	717.3	711.7	774.3	795.7
GFP*=TP*-Mp	221.9	247.7	242.9	269.1	307.0	319.6	336.7	335.3	365.7	384.1	402.7	403.7	439.4	451.9
GOtt	72.83	79.92	79.59	85.39	93.53	97.11	100.29	102.89	111.61	118.21	124.57	127.63	138.26	141.96
U*	197.4	225.0	215.7	241.2	275.9	287.0	302.7	296.5	325.1	343.4	357.2	351.9	382.5	392.8
GOp	320.6	367.7	351.7	395.6	455.4	474.7	502.7	490.9	539.8	571.0	594.1	584.0	637.2	656.6
GFU*=TP*-(C+I+G+(X-M))	197.7	221.2	216.2	240.5	275.8	286.9	302.6	300.1	327.8	343.8	360.1	359.7	391.8	402.8

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
GFP*/GNP	0.87	0.87	0.86	0.86	0.86	0.86	0.86	0.85	0.85	0.84	0.84	0.84	0.84	0.84
TP*/GNP	1.52	1.51	1.51	1.50	1.50	1.49	1.47	1.46	1.46	1.43	1.42	1.43	1.46	1.47
GFP*/TP*	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.58	0.57
U/TP*	0.49	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.48	0.47	0.48	0.48	0.49
GVA*/TV*	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.58	0.57
GOtt/TV*	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.18	0.18
U/V*	2.65	2.66	2.67	2.67	2.66	2.62	2.61	2.59	2.53	2.51	2.53	2.48	2.54	2.61
S*/V*	1.93	1.96	1.97	2.01	2.00	2.00	2.02	2.00	1.92	1.94	1.99	1.91	1.86	1.87
TP*-Real	26.01	27.26	28.19	29.59	31.28	32.85	33.42	34.68	35.33	34.68	35.31	37.17	40.00	40.04
GNP-Real	17.11	18.01	18.73	19.75	20.86	22.06	22.74	23.68	24.22	24.18	24.84	26.08	27.46	27.27
(GNP-Real/Total FT&PT)=y	271.47	278.30	284.76	292.83	298.54	299.21	300.58	304.24	302.39	302.22	311.15	318.63	321.24	313.98
Total Productive Workers	28792.85	29352.42	29434.16	29675.01	30737.84	31887.36	32168.58	32734.70	33384.95	32459.98	31948.03	33127.50	34667.32	34788.79
(TP*-Real/Total Productive Workers)=	903.25	928.64	957.79	996.97	1017.56	1030.13	1038.93	1059.44	1058.36	1068.24	1105.27	1122.03	1153.77	1151.06
(Profit/Wage)=(GNP-EC)/EC	0.75	0.75	0.76	0.75	0.76	0.74	0.72	0.70	0.67	0.64	0.67	0.67	0.67	0.65
GOp/TV*	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.82	0.82
GFU*/TP*	0.51	0.51	0.51	0.51	0.52	0.52	0.52	0.52	0.52	0.52	0.53	0.52	0.52	0.51
GNP	533.8	574.6	606.9	649.8	705.1	772.0	816.4	892.7	963.9	1015.5	1102.7	1212.8	1359.3	1472.8
Total EC = EC	305560	327422	345517	370986	399819	442953	475518	524721	578370	618288	659366	726240	812828	891285
FEE	56438.00	57991.00	58861.00	60159.00	62581.00	66015.00	67934.00	69798.00	71654.00	71158.00	70776.00	72601.00	75959.00	77064.00
GNP Deflator	31.2	31.9	32.4	32.9	33.8	35.0	35.9	37.7	39.8	42.0	44.4	46.5	49.5	54.0
TV*=GOp+GOtt+S.D.	811.5	869.6	913.4	973.3	1057.1	1149.6	1200.1	1307.3	1406.2	1456.6	1567.9	1728.4	1979.9	2161.9
GVA*=TV*-Mp	464.0	498.2	523.7	560.9	609.7	665.8	699.5	762.1	819.6	854.1	923.2	1014.1	1142.5	1235.3
V*	150.0	159.6	167.0	176.8	192.8	211.5	220.7	241.9	267.0	276.7	294.3	331.4	378.6	407.5
S*	289.19	312.47	329.50	355.63	386.44	421.90	445.47	483.65	512.89	536.05	584.18	632.72	704.99	762.05
TP*=U*+C*+I*+G*+(X-M)	811.4	869.5	913.4	973.4	1057.2	1149.7	1199.8	1307.5	1406.3	1456.4	1567.8	1728.4	1979.9	2162.4
GFP*=TP*-Mp	463.9	498.1	523.7	561.0	609.8	665.9	699.2	762.3	819.7	853.9	923.1	1014.1	1142.5	1235.8
GOtt	145.75	155.04	161.73	175.86	188.71	203.55	218.37	238.61	257.60	271.43	295.29	322.13	360.61	392.10
U*	398.2	425.0	445.6	472.8	512.5	554.3	576.6	627.3	674.9	695.2	744.6	822.4	959.9	1061.9
GOp	667.0	714.6	752.3	798.8	869.6	943.9	982.1	1069.7	1152.5	1186.2	1270.8	1407.9	1623.6	1771.5
GFU*=TP*-(C+I+G+(X-M))	413.2	444.5	467.8	500.5	544.7	595.4	623.2	680.1	731.3	761.2	823.2	906.0	1020.0	1100.5

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GFP*/GNP	0.84	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.84	0.85	0.85	0.84	0.84
TP*/GNP	1.48	1.51	1.54	1.54	1.53	1.52	1.52	1.50	1.49	1.51	1.50	1.47	1.46
GFP*/TP*	0.57	0.56	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.56	0.56	0.57	0.58
U/TP*	0.50	0.50	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.50
GVA*/TV*	0.57	0.56	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.56	0.56	0.57	0.58
GOtt/TV*	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.18	0.18	0.18	0.19	0.19	0.19
U/V*	2.79	2.90	2.97	2.94	2.89	2.93	3.02	3.02	3.01	3.05	3.09	3.16	3.16
S*/V*	2.02	2.03	2.02	1.99	1.95	1.99	2.08	2.10	2.13	2.18	2.24	2.40	2.43
TP*-Real	39.94	42.70	45.44	47.88	48.77	48.32	49.51	47.64	48.96	52.84	54.23	54.79	56.27
GNP-Real	26.95	28.25	29.58	31.16	31.91	31.88	32.47	31.66	32.78	35.03	36.20	37.23	38.46
(GNP-Real/Total FT&PT)=y	315.82	322.13	325.97	327.60	325.37	323.97	327.35	323.62	332.20	339.13	341.56	344.92	347.11
Total Productive Workers	32675.81	33723.57	34842.16	36684.33	37667.99	36916.81	36784.02	35274.58	35214.92	36995.18	37353.35	36440.65	37295.42
(TP*-Real/Total Productive Workers)=	1222.33	1266.18	1304.16	1305.12	1294.71	1308.91	1346.10	1350.51	1390.33	1428.33	1451.74	1503.48	1508.89
(Profit/Wage)=(GNP-EC)/EC	0.68	0.69	0.69	0.69	0.68	0.67	0.69	0.66	0.69	0.70	0.70	0.69	0.69
GOp/TV*	0.82	0.82	0.82	0.82	0.82	0.83	0.83	0.82	0.82	0.82	0.81	0.81	0.81
GFU*/TP*	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.50	0.50
GNP	1598.4	1782.8	1990.5	2249.7	2508.2	2732.0	3052.6	3166.0	3405.7	3772.2	4014.90	4240.30	4526.70
Total EC = EC	948677	1057852	1176617	1329227	1491399	1638221	1807408	1907008	2020703	2213925	2367548	2507094	2683382
FEE	75296.00	77631.00	80335.00	84394.00	87086.00	87050.00	87805.00	86041.00	86715.00	91173.00	93682.00	95421.00	98148.00
GNP Deflator	59.3	63.1	67.3	72.2	78.6	85.7	94.0	100.0	103.9	107.7	110.9	113.90	117.70
TV*=GOp+GOtt+S.D.	2367.0	2692.6	3055.5	3457.1	3833.2	4141.3	4654.5	4763.9	5087.2	5690.8	6013.7	6240.5	6623.4
GVA*=TV*-Mp	1343.3	1505.2	1688.3	1911.2	2122.7	2290.0	2576.2	2649.3	2851.6	3193.6	3395.1	3576.1	3814.8
V*	420.4	468.9	526.4	601.5	678.4	721.8	788.3	804.8	858.6	948.5	989.4	994.8	1053.3
S*	849.50	950.85	1063.00	1197.91	1320.52	1434.75	1637.96	1691.40	1830.83	2063.74	2214.91	2386.25	2555.67
TP*=U*+C*+I*+G*+(X-M)	2368.5	2694.4	3058.1	3456.8	3833.3	4141.1	4654.4	4763.9	5087.0	5691.0	6013.8	6240.3	6623.5
GFP*=TP*-Mp	1344.7	1507.1	1690.8	1910.9	2122.8	2289.8	2576.1	2649.3	2851.4	3193.8	3395.2	3575.9	3814.9
GOtt	433.36	479.07	537.75	607.13	674.01	710.51	802.96	842.51	914.85	1031.63	1117.73	1195.04	1277.23
U*	1174.9	1357.7	1563.9	1767.7	1958.9	2118.1	2380.0	2431.7	2588.0	2891.7	3054.6	3143.0	3327.7
GOp	1931.2	2209.9	2517.8	2851.8	3160.1	3425.9	3847.4	3921.5	4167.1	4653.8	4900.8	5059.1	5354.3
GFU*=TP*-(C+I+G+(X-M))	1193.6	1336.7	1494.2	1689.0	1874.3	2023.0	2274.4	2332.2	2499.0	2799.3	2959.2	3097.3	3295.8

E73+E75+G73+G75

	1947	1958	1963	1967	1972	1977
TV^*	D27+E27	D57+E57	D87+E87	D117+E117	D147+E147	D177+E177
✓ $C^* = M_p'$ ✓	D13+D15	D43+D45	D73+D75	D103+D105	D133+D135	D163+D165
GVA^*	$TV^* - C^*$ (C7+F7)					
TP^*	Q13+Q15	Q43+Q45	- - -			
✓ $U^* = M_i'$	✓					
GFP^*	$TP^* - M_p'$					
$RY_{pttr} + M_{tt}' + M_{ry}$	E13+E15+G13+G15+D17+E17+G17					
CON^*	L13+L15					
IG^*	M13+M15					
$X^* - M^*$	N13+N15					
G^*	O13+O15					

Checks

GVA^*	D17+D24+E17+E24 (E13+E15)	47+54	77+84	107+114	137+144
GFP^*	$\Sigma M_{tt}' + M_{ry}' =$ $+ CON^* + IG^* + \cdot$				

GD Q27

M^* D13+D15+E13+E15+G13+G15 = $M_p' + RY_g$

GFD = GD − M^* + IVA

CON	L27
IG	M27
X-M	N27
G	O27

Check GFD CON+IG+(X-M)+G