time the trade-off relationship is nonexistent. Rather our feeling is that a trade-off relationship between inflation and unemployment, as defined in section two of this study within the framework of a price adjustment mechanism, emerges so to speak in particular periods of time given a chance. This is in contrast to some of the propositions set out in the first part of this study and which tend to disregard this relationship, i.e.: the hypothesis of Professor Forrester. However, it remains nonetheless true that while data for the decade of the 1960's tends to confirm the existence and stability of this relationship, the data of the following decade, on the other hand, appear to garble so to speak the stability of this relationship altogether. It is indeed difficult to find during this period a fit for a reasonably stable curve. This is why we introduce the concept of trade-off zones implying still that there is an inherent conflict between the twin objectives of inflation and unemployment. This view stems from the fact that despite the disappearance of the trade-off curve in the 1970's, the data however reveal for the most part an inverse relationship between inflation and unemployment.

To the question of why these shifts do occur, our analysis, although not putting forward a complete theory, indicates a rather strong correlation between shifts in the trade-off relationship and business cycles. As a matter of fact it can be said in this context that the business cycle, far from disappearing, reveals itself in the trade-off shifts and in the discontinuities in the relationships of employment and physical output with real investment. Indeed the combined effect of fiscal and monetary policy have tended to 'dilute' the visibility of the post war business cycle. With policies aimed at increasing aggregate demand without corresponding increases in the supply side, the real contractions in the economy are 'blurred' and the resulting effect is a simultaneous increase in inflation and unemployment. This may be, as Higgins suggests, because of differences in the investment schedules between public and private sector investments. This proposition would imply in turn certain relationships between interest rates and the structure of capital as expounded by the Austrian Theory of capital.

These latter considerations lead us also to consider the effect of fiscal and monetary policies upon shifts in the trade-off relationship. Already in part two we have underlined the 'Accelerationist' effect resulting from inflationary expectations and unexpected increases in aggregate demand. In part four

examination of trends in monetary aggregates data and interest rates tends to support the thesis that monetary policy in the early 70's had a great part of responsibility in the quantum leap of inflation. Clearly the combination of international events and the degree of dependency of the Canadian economy cannot be discounted in that context. There remains nonetheless the strong perception that monetary policy greatly compounded this overall effect.

This view is corroborated by an analysis of monetary policy during the same period in the U.S.[1] Apparently during the chairmanship of the Federal Reserve System by Arthur F. Burns (February 1970 to March 1978) monetary policy became highly pro-cyclical. Poole's conclusion is that the Burns years produced one of the most inflationary policies of any period since the establishment of the Federal Reserve System. This monetary expansion, suggests Pierce, eventually took its toll upon the international financial system.

Moreover the shifts in the trade-off curves and their noted relation with business cycles would have important implications with respect to fiscal and monetary policy. In this context simple movements along a Phillips curve cannot constitute a relevant and acceptable framework for the determination of policy. Indeed the use of such an instrument in a world of shifting trade-off curves could lead towards an acceleration of inflation without solving the unemployment problem. Instead it would appear important to relate the actual behaviour of inflation and unemployment to the cyclical pattern in real economic activity. The proper type and mix of monetary and fiscal policy would depend then upon the degree to which current inflation and unemployment levels are in fact the result of the underlining real forces in cyclical expansions or cyclical contractions respectively. In the opposite case, when inflation and unemployment would appear to be related significantly to exogenous shifts such as through import markets or through participation rates it would seem reasonable not to hasten in applying without qualification the traditional aggregate demand medicine.

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1. See: William Poole; "Burnsian Monetary Policy: Eight Years of Progress?", and James L. Pierce; "The Political Economy of Arthur Burns", with a discussion by Jerry L. Jordan, Raymond E. Lombra and Thomas Mayer in Papers and Proceedings of the thirty-seventh annual meeting of the American Finance Association, Chicago, Illinois, August 29-31, 1978. Reported in the Journal of Finance, Vol. 34, May 1979.

Finally it would seem appropriate to end this section by assessing briefly the prospects for future research in this area. Some, like Professor L. Klein for example, have argued for greater disaggregation in econometric models in order to capture more effectively the complex nature of the relationship between inflation and unemployment. Whether this is an optimal proposition remains to be seen. The nature of the problem and the policy considerations attached to it are such that investment in time and resources into further model dissagregation could prove very costly while becoming quickly obsolete,given the current rate of change in the underl ing structure of the world economies as a result for example of the energy problem. It would appear relevant therefore to undertake research in the areas of capital structure and the new nature of the business cycle that confronts western economies. Comparative analyses with other economies in the lines suggested herein would seem appropriate. Furthermore it should be also realized that conventional aggregate fiscal policies are not a panacea. More effective policies aiming at reducing unemployment at the regional level should be sought with careful consideration of the differences in effect between public and private sector investments.

APPENDIX A

Data and Regression Analysis

SOCIO-ECONOMIC DATA MATRIX VARIABLES

A - INFLATION RATE
B - CONSUMER PRICE INDEX
C - UNEMPLOYMENT RATE
D - EMPLOYMENT (THOUSANDS)
E - EMPLOYMENT - NET AGRICULTURE, PUBLIC ADMIN & DEFENSE
F - G,N,E, (MILLIONS CONSTANT 1971 DOLLARS)
G - G,N,E, - IMPLICIT PRICE INDEX
H - MACHINERY AND EQUIPMENT (MILLIONS CONSTANT 1971 DOLLARS
I - MACHINERY AND EQUIPMENT - IMPLICIT PRICE INDEX
J - R,D,P, - TOTAL GOODS INDEX
K - DISCOMFORT INDEX (A+C)
P - GOVT, EXPEND, - GOODS & SERVICES (MILLIONS 1971 DOLLARS
Q - LABOUR FORCE PARTICIPATION RATE
R - U,S, DOLLAR PRICE IN CANADIAN DOLLARS
Z - (A-C)/SQRT(2)
X - K/SQRT(2)
*D - PERCENTAGE YEARLY GROWTH OF D
*E - PERCENTAGE YEARLY GROWTH OF E
*F - PERCENTAGE YEARLY GROWTH OF F
*H - PERCENTAGE YEARLY GROWTH OF H
*J - PERCENTAGE YEARLY GROWTH OF H

SOCIO-ECONOMIC DATA MATRIX

YEAR	A	B	C	D	E	F	G	H	I	J	K	P	Q	R	Z	X	*D	*E	*F	*H	*J
1955	0.1	67.5	4.4	5364	4224	43957	64.9	2809	65.0	45.8	4.5	8736	52.9	0.986	-3.0	3.2					
1956	1.5	68.5	3.4	5585	4487	47634	67.3	3540	69.0	49.8	4.9	8956	53.5	0.984	-1.3	3.5	4.12	6.23	8.36	26.02	8.7
1957	3.2	70.7	4.6	5725	4659	48710	68.8	3573	72.6	50.0	7.8	8807	54.0	0.959	-1.0	5.5	2.51	3.83	2.26	0.93	0.4
1958	2.6	72.6	7.1	5695	4655	49844	69.8	3035	73.8	49.7	9.7	9074	53.9	0.971	-3.2	6.9	-0.52	-0.09	2.33	-15.06	-0.6
1959	0.9	73.3	6.0	5855	4835	51737	71.2	3190	75.5	53.5	6.9	8999	53.9	0.959	-3.6	4.9	2.81	3.87	3.80	5.11	7.6
1960	1.4	74.3	7.0	5955	4952	53231	72.1	3299	76.5	53.9	8.4	9218	54.3	0.970	-4.0	5.9	1.71	2.42	2.89	3.42	0.7
1961	0.9	75.0	7.2	6049	5043	54741	72.4	3009	77.0	55.7	8.1	10494	54.3	1.013	-4.5	5.7	1.58	1.84	2.84	-8.79	3.3
1962	1.1	75.8	5.9	6225	5223	58475	73.4	3218	79.6	60.1	7.0	10911	53.9	1.069	-3.4	4.9	2.91	3.97	6.82	6.95	7.9
1963	1.8	77.2	5.5	6375	5381	61487	74.8	3488	81.8	63.4	7.3	11070	53.8	1.079	-2.6	5.2	2.41	3.03	5.15	8.39	5.5
1964	1.7	78.6	4.7	6609	5626	65610	76.6	4116	85.1	69.6	6.4	11637	54.1	1.079	-2.1	4.5	3.67	4.55	6.71	18.00	9.8
1965	2.5	80.5	3.9	6862	5906	69981	79.1	4826	88.4	75.7	6.4	12253	54.4	1.078	-1.0	4.5	3.83	4.98	6.66	17.25	8.8
1966	3.7	83.5	3.6	7152	6233	74844	82.6	5755	91.2	80.7	7.3	13388	55.1	1.077	0.1	5.2	4.23	5.54	6.95	19.25	6.6
1967	3.6	86.5	4.1	7379	6421	77344	85.9	5865	90.7	83.0	7.7	14343	55.5	1.079	-0.4	5.4	3.17	3.02	3.34	1.91	2.9
1968	4.1	90.0	4.5	7593	6640	81864	88.7	5481	90.6	88.3	8.6	15429	57.6	1.077	-0.3	6.1	2.90	3.41	5.84	-6.55	6.4
1969	4.5	94.1	4.4	7832	6875	86225	92.6	5982	92.9	93.7	8.9	15993	57.9	1.077	0.1	6.3	3.15	3.54	5.33	9.14	6.1
1970	3.4	97.2	5.7	7919	6957	88390	96.9	6118	97.4	94.7	9.1	17650	57.8	1.044	-1.6	6.4	1.11	1.19	2.51	2.27	1.1
1971	2.8	100.0	6.2	8107	7117	94450	100.0	6278	100.0	100.0	9.0	18368	58.1	1.010	-2.4	6.4	2.37	2.30	6.86	2.62	5.6
1972	4.8	104.8	6.2	8363	7377	100248	105.0	6882	102.6	106.5	11.0	18930	58.6	0.991	-1.0	7.8	3.16	3.65	6.14	9.62	6.5
1973	7.6	112.7	5.6	8802	7795	107812	114.6	8256	106.8	115.8	13.2	19795	59.7	1.000	1.4	9.3	5.25	5.67	7.55	19.97	8.7
1974	10.9	125.0	5.4	9185	8150	111678	132.1	8904	121.8	119.5	16.3	20656	60.5	0.978	3.9	11.5	4.35	4.55	3.59	7.85	3.2
1975	10.8	138.5	7.0	9284	8209	113133	146.2	9216	138.9	114.6	17.8	21571	61.1	1.017	2.7	12.6	1.08	0.72	1.30	3.50	-4.1
1976	7.5	148.9	7.2	9479	8402	119394	160.4	9526	148.6	120.7	14.7	21757	61.1	0.986	0.2	10.4	2.10	2.35	5.53	3.36	5.3
1977	8.0	160.8	8.2	9648	8563	122561	171.5	9557	159.3	124.2	16.2	22225	61.5	1.063	-0.1	11.5	1.78	1.92	2.65	0.33	2.9
1978	8.9	175.2	8.5	9972	8865	126676	183.0	9578	176.9	128.2	17.4	22591	62.6	1.140	0.3	12.3	3.36	3.53	3.36	0.22	3.2

YEAR	D	E	F	H	J	A	SD	SE	SF	SJ	SM	L	O	T
				W	BW	Y	BY	N	BN	L				
1956	5585	4487	47634	3540	49.800	1.500	4.120	6.230	8.360	8.700	26.020			
				1.578	0.158	13.456	0.321	1.268	0.239	0.014		0,334	-166.933	-949.475
1957	5725	4659	48710	3573	50.000	3.200	2.510	3.830	2.260	0.400	0.930			
				1.602	2.699	13.633	2.430	1.304	4.118	0.014		0,430	-7.748	-973,946
1958	5695	4655	49844	3035	49.700	2.600	-0.520	-0.090	2.330	-0.600	-15.060			
				1.876	0.035	16.423	-0.155	1.534	0.006	0.016		0,040	12.154	-1007.874
1959	5855	4835	51737	3190	53.500	0.900	2.810	3.870	3.800	7.600	5.110			
				1.835	0.550	16.218	0.744	1.516	0.757	0.017		1,487	-137.384	-965.498
1960	5955	4952	53231	3299	53.900	1.400	1.710	2.420	2.890	0.700	3.420			
				1.805	0.500	16.135	0.845	1.501	0.708	0.016		0,205	-12.772	-986.564
1961	6049	5043	54741	3009	55.700	0.900	1.580	1.840	2.840	3.300	-8.790			
				2.010	-0.180	18.192	-0.323	1.676	-0.209	0.019		-0,375	-58.175	-985.654
1962	6225	5223	58475	3218	60.100	1.100	2.910	3.570	6.820	7.900	6.950			
				1.934	0.419	18.171	0.981	1.623	0.514	0.019		1,137	-127.780	-970.860
1963	6375	5381	61487	3488	63.400	1.800	2.410	3.030	5.150	5.500	8.390			
				1.828	0.287	17.628	0.614	1.543	0.361	0.018		0,656	-84.052	-967.494
1964	6609	5626	65610	4116	69.600	1.700	3.670	4.990	6.710	9.800	18.000			
				1.606	0.204	15.940	0.373	1.367	0.253	0.017		0,544	-132.636	-938.550
1965	6862	5906	69981	4826	75.700	2.500	3.830	4.980	6.660	8.800	17.250			
				1.422	0.222	14.501	0.386	1.224	0.289	0.016		0,510	-107.378	-921.147
1966	7152	6233	74844	5755	80.700	3.700	4.230	5.540	6.950	6.600	19.250			
				1.243	0.220	13.005	0.361	1.083	0.288	0.014		0,343	-75.764	-924.333
1967	7379	6421	77344	5865	83.000	3.600	3.170	3.020	3.340	2.900	1.910			
				1.258	1.660	13.187	1.749	1.095	1.581	0.014		1,518	-32.519	-931.552
1968	7593	6640	81864	5481	88.300	4.100	2.900	3.410	5.840	6.400	-6.550			
				1.385	-0.443	14.936	-0.892	1.211	-0.521	0.016		-0,977	-67.131	-928.220
1969	7832	6875	86225	5982	93.700	4.500	3.150	3.540	5.330	6.100	9.140			
				1.309	0.345	14.414	0.583	1.149	0.387	0.016		0,667	-59.851	-918.818
1970	7919	6957	88390	6118	94.700	3.400	1.110	1.190	2.510	1.100	2.270			
				1.294	0.489	14.448	1.106	1.137	0.524	0.015		0,485	-10.815	-933.022
1971	8107	7117	94450	6278	100.000	2.800	2.370	2.300	6.860	5.600	2.620			
				1.291	0.905	15.045	2.618	1.134	0.878	0.016		2,137	-52.823	-944.106
1972	8363	7377	100248	6882	106.500	4.800	3.160	3.650	6.140	6.500	9.620			
				1.215	0.328	14.567	0.638	1.072	0.379	0.015		0,676	-57.392	-939.980
1973	8802	7795	107812	8256	115.800	7.600	5.250	5.670	7.550	8.700	19.970			
				1.066	0.263	13.059	0.378	0.944	0.284	0.014		0,436	-69.882	-928.767
1974	9185	8150	111678	8904	119.500	10.900	4.350	4.550	3.590	3.200	7.850			
				1.032	0.554	12.542	0.457	0.915	0.580	0.013		0,408	-24.995	-933.720
1975	9284	8209	113133	9216	114.600	10.800	1.080	0.720	1.300	-4.100	3.500			
				1.007	0.309	12.276	0.371	0.891	0.206	0.012		-1,171	35.330	-986.824
1976	9479	8402	119394	9526	120.700	7.500	2.100	2.350	5.530	5.300	3.360			
				0.995	0.625	12.533	1.646	0.882	0.699	0.013		1,577	-43.390	-988.831
1977	9648	8563	122561	9557	124.200	8.000	1.780	1.920	2.650	2.900	0.330			
				1.010	5.394	12.824	8.030	0.896	5.818	0.013		8,788	-23.020	-986.769
1978	9972	8865	126676	9578	128.200	8.900	3.360	3.530	3.360	3.200	0.220			
				1.041	15.273	13.226	15.273	0.926	16.045	0.013		14,545	-24.638	-988.090

FILE NONAME (CREATION DATE = 05/25/79)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. KT

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SGT

MULTIPLE R	0.35461	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.12575	REGRESSION	1.	38.51853	38.51853	2.87675
ADJUSTED R SQUARE	0.08204	RESIDUAL	20.	267.79238	13.38962	
STANDARD ERROR	3.65918					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SGT	63.5238092	0.35461	37.45293	2.877
(CONSTANT)	9.9476191			

------------------ VARIABLES NOT IN THE EQUATION ------------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SGTM1	0.46026	0.49170	0.99773	6.058
SDT	-0.15668	-0.16022	0.91421	0.501
SDTM1	-0.01823	-0.01756	0.81118	0.006

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SGTM1

MULTIPLE R	0.58061	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.33711	REGRESSION	2.	103.26141	51.63070	4.83125
ADJUSTED R SQUARE	0.26734	RESIDUAL	19.	203.04950	10.68682	
STANDARD ERROR	3.26907					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SGT	67.4499996	0.37653	33.49800	4.054
SGTM1	82.4499997	0.46026	33.49800	6.058
(CONSTANT)	9.5550000			

------------------ VARIABLES NOT IN THE EQUATION ------------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SDT	-0.02464	-0.02780	0.84327	0.014
SDTM1	-0.21292	-0.22195	0.72032	0.933

FILE NONAME (CREATION DATE = 05/25/79)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. KT

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SDT

MULTIPLE R	0.58106	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.33763	REGRESSION	3.	103.41829	34.47276	3.05832
ADJUSTED R SQUARE	0.22723	RESIDUAL	18.	202.89262	11.27181	
STANDARD ERROR	3.35735					

---------------- VARIABLES IN THE EQUATION ----------------

VARIABLE	B	BETA	STD ERROR B	F
SGT	68.6870284	0.38344	35.96503	3.647
SGTM1	81.2727736	0.45369	35.82053	5.148
SDT	-0.0738304	-0.02464	0.62581	0.014
(CONSTANT)	9.7524595			

------------ VARIABLES NOT IN THE EQUATION ------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SDTM1	-0.21706	-0.22118	0.68776	0.874

* *

VARIABLE(S) ENTERED ON STEP NUMBER 4.. SDTM1

MULTIPLE R	0.60830	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.37003	REGRESSION	4.	113.34410	28.33602	2.49635
ADJUSTED R SQUARE	0.22180	RESIDUAL	17.	192.96681	11.35099	
STANDARD ERROR	3.36912					

---------------- VARIABLES IN THE EQUATION ----------------

VARIABLE	B	BETA	STD ERROR B	F
SGT	84.0010165	0.46892	39.63283	4.492
SGTM1	95.0442567	0.53057	38.84596	5.986
SDT	0.0539472	0.01801	0.64269	0.007
SDTM1	-0.6356483	-0.21706	0.67975	0.874
(CONSTANT)	11.0023815			

------------ VARIABLES NOT IN THE EQUATION ------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. KT

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SGT	0.35461	0.12575	0.12575	0.35461	84.0010165	0.46892
SGTM1	0.58061	0.33711	0.21136	0.44233	95.0442567	0.53057
SDT	0.58106	0.33763	0.00051	-0.03937	0.0539472	0.01801
SDTM1	0.60830	0.37003	0.03240	0.13930	-0.6356483	-0.21706
(CONSTANT)					11.0023815	

FILE NONAME (CREATION DATE = 05/25/79)

* M U L T I P L E   R E G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. HT

VARIABLE(S) ENTERED ON STEP NUMBER 1.. FTM1

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.98711	REGRESSION	1.	117313699.19651	117313699.19651	760.87946
R SQUARE	0.97439	RESIDUAL	20.	3083634.25803	154181.71290	
ADJUSTED R SQUARE	0.97311					
STANDARD ERROR	392.65979					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
FTM1	0.0943203	0.98711	0.00342	760.879
(CONSTANT)	-1586.7295559			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SJT	-0.01801	-0.11154	0.98240	0.239
SJTM1	0.03933	0.24397	0.98549	1.202
FT	0.01231	0.00476	0.00383	0.000

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SJTM1

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.98788	REGRESSION	2.	117497243.42905	58748621.71452	384.89281
R SQUARE	0.97591	RESIDUAL	19.	2900090.02550	152636.31713	
ADJUSTED R SQUARE	0.97338					
STANDARD ERROR	390.68698					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
FTM1	0.0947730	0.99185	0.00343	764.719
SJTM1	26.2325507	0.03933	23.92209	1.202
(CONSTANT)	-1745.6946248			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SJT	-0.01969	-0.12566	0.98068	0.289
FT	-0.00196	-0.00078	0.00383	0.000

DEPENDENT VARIABLE.. HT

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SJT

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.98808	REGRESSION	3.	117543035.26936	39181011.75645	247.08638
R SQUARE	0.97629	RESIDUAL	18.	2854298.18518	158572.12140	
ADJUSTED R SQUARE	0.97234					
STANDARD ERROR	398.21115					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
FTM1	0.0945328	0.98934	0.00352	720.573
SJTM1	26.7816219	0.04015	24.40420	1.204
SJT	-13.5193836	-0.01969	25.15801	0.289
(CONSTANT)	-1669.1849386			

------------ VARIABLES NOT IN THE EQUATION ------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
FT	0.93986	0.20055	0.00108	0.712

* *

VARIABLE(S) ENTERED ON STEP NUMBER 4.. FT

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.98856	REGRESSION	4.	117657831.80643	29414457.95161	182.53166
R SQUARE	0.97725	RESIDUAL	17.	2739501.64812	161147.15577	
ADJUSTED R SQUARE	0.97189					
STANDARD ERROR	401.43138					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
FTM1	0.0042777	0.04477	0.10699	0.002
SJTM1	27.2854680	0.04091	24.60879	1.229
SJT	-47.6614611	-0.06943	47.74457	0.997
FT	0.0865971	0.93986	0.10260	0.712
(CONSTANT)	-1541.6915282			

------------ VARIABLES NOT IN THE EQUATION ------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAM (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. HT

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
FTM1	0.98711	0.97439	0.97439	0.98711	0.0042777	0.04477
SJTM1	0.98788	0.97591	0.00152	-0.08014	27.2854680	0.04091
SJT	0.98808	0.97629	0.00038	-0.14865	-47.6614611	-0.06943
FT	0.98856	0.97725	0.00095	0.98527	0.0865971	0.93986
(CONSTANT)					-1541.6915282	

* M U L T I P L E   R E G R E S S I O N * * * * * * * * * * * * *   VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE.. ETM1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. JT

MULTIPLE R	0.99125	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.98258	REGRESSION	1.	37703297.06862	37703297.06862	1128.08433
ADJUSTED R SQUARE	0.98171	RESIDUAL	20.	668448.20411	33422.41021	
STANDARD ERROR	182.81797					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
JT	49.7439313	0.99125	1.48105	1128.084
(CONSTANT)	2041.7233904			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
JTM1	0.94596	0.79802	0.01240	33.318

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. JTM1

MULTIPLE R	0.99683	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.99367	REGRESSION	2.	38128988.43472	19064494.21736	1492.13259
ADJUSTED R SQUARE	0.99301	RESIDUAL	19.	242756.83801	12776.67568	
STANDARD ERROR	113.03396					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
JT	2.5680950	0.05117	8.22413	0.098
JTM1	48.5705899	0.94596	8.41463	33.318
(CONSTANT)	2094.2602280			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAM (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE.. ETM1

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
JT	0.99125	0.98258	0.98258	0.99125	2.5680950	0.05117
JTM1	0.99683	0.99367	0.01109	0.99682	48.5705899	0.94596
(CONSTANT)					2094.2602280	

* M U L T I P L E   R E G R E S S I O N * * * * * * * * * * * * * *

VARIABLE LIST 4
REGRESSION LIST 1

DEPENDENT VARIABLE.. SETM1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SJTM1

MULTIPLE R	0.76186	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.58043	REGRESSION	1.	32.20826	32.20826	27.66745
ADJUSTED R SQUARE	0.55945	RESIDUAL	20.	23.28242	1.16412	
STANDARD ERROR	1.07894					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJTM1	0.3449689	0.76186	0.06558	27.667
(CONSTANT)	1.6570323			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SJT	-0.41255	-0.63586	0.99673	12.896

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SJT

MULTIPLE R	0.86606	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.75006	REGRESSION	2.	41.62161	20.81081	28.50987
ADJUSTED R SQUARE	0.72376	RESIDUAL	19.	13.86907	0.72995	
STANDARD ERROR	0.85437					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJTM1	0.3556494	0.78544	0.05202	46.745
SJT	-0.1922690	-0.41255	0.05354	12.896
(CONSTANT)	2.4616057			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 4
REGRESSION LIST 1

DEPENDENT VARIABLE.. SETM1

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SJTM1	0.76186	0.58043	0.58043	0.76186	0.3556494	0.78544
SJT	0.86606	0.75006	0.16964	-0.36764	-0.1922690	-0.41255
(CONSTANT)					2.4616057	

FILE NONAME (CREATION DATE = 05/25/79)

* M U L T I P L E   R E G R E S S I O N * * * * * * * * * * * * * VARIABLE LIST 5
REGRESSION LIST 1

DEPENDENT VARIABLE.. SETM1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SFTM1

MULTIPLE R	0.73805	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.54471	REGRESSION	1.	30.22644	30.22644	23.92824
ADJUSTED R SQUARE	0.52195	RESIDUAL	20.	25.26424	1.26321	
STANDARD ERROR	1.12393					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SFTM1	0.5767865	0.73805	0.11791	23.928
(CONSTANT)	0.5132243			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SJT	-0.43188	-0.63785	0.99311	13.033

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SJT

MULTIPLE R	0.85437	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.72995	REGRESSION	2.	40.50542	20.25271	25.67866
ADJUSTED R SQUARE	0.70152	RESIDUAL	19.	14.98526	0.78870	
STANDARD ERROR	0.88809					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SFTM1	0.6048057	0.77390	0.09349	41.848
SJT	-0.2012810	-0.43188	0.05575	13.033
(CONSTANT)	1.2737599			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 5
REGRESSION LIST 1

DEPENDENT VARIABLE.. SETM1

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SETM1	0.73805	0.54471	0.54471	0.73805	0.6048057	0.77390
SJT	0.85437	0.72995	0.18524	-0.36764	-0.2012810	-0.43188
(CONSTANT)					1.2737599	

FILE NONAME (CREATION DATE = 05/25/79)

* MULTIPLE REGRESSION *

DEPENDENT VARIABLE SETM1 FROM VARIABLE LIST 5
REGRESSION LIST 1

SEQNUM	OBSERVED SETM1	PREDICTED SETM1	RESIDUAL	PLOT OF STANDARDIZED RESIDUAL -2.0 -1.0 0.0 1.0 2.0
1	6.230000	6.249423	-0.1942306E-01	
2	3.830000	2.761389	1.068611	
3	-0.9000000E-01	1.153221	-1.243221	
4	3.870000	3.431125	0.4388752	
5	2.420000	2.357421	0.6257909E-01	
6	1.840000	1.401288	0.4387121	
7	3.570000	4.291489	-0.7214890	
8	3.030000	2.415955	0.6140449	
9	4.550000	3.560733	0.9892670	
10	4.980000	3.973311	1.006689	
11	5.540000	4.893444	0.6465556	
12	3.020000	2.005612	1.014388	
13	3.410000	3.578011	-0.1680108	
14	3.540000	4.275965	-0.7359651	
15	1.190000	1.664648	-0.4746484	
16	2.300000	4.114400	-1.814400	
17	3.650000	3.236122	0.4138782	
18	5.670000	5.195944	0.4740565	
19	4.550000	4.270265	0.2797355	
20	0.7200000	0.9932178	-0.2732178	
21	2.350000	4.034620	-1.684620	
22	1.920000	2.232396	-0.3123956	

DURBIN-WATSON TEST OF RESIDUAL DIFFERENCES COMPARED BY CASE ORDER (SEQNUM).

VARIABLE LIST 1, REGRESSION LIST 1. DURBIN-WATSON TEST 0.52984
VARIABLE LIST 2, REGRESSION LIST 1. DURBIN-WATSON TEST 1.07016
VARIABLE LIST 3, REGRESSION LIST 1. DURBIN-WATSON TEST 0.84918
VARIABLE LIST 4, REGRESSION LIST 1. DURBIN-WATSON TEST 1.32625
VARIABLE LIST 5, REGRESSION LIST 1. DURBIN-WATSON TEST 1.73157

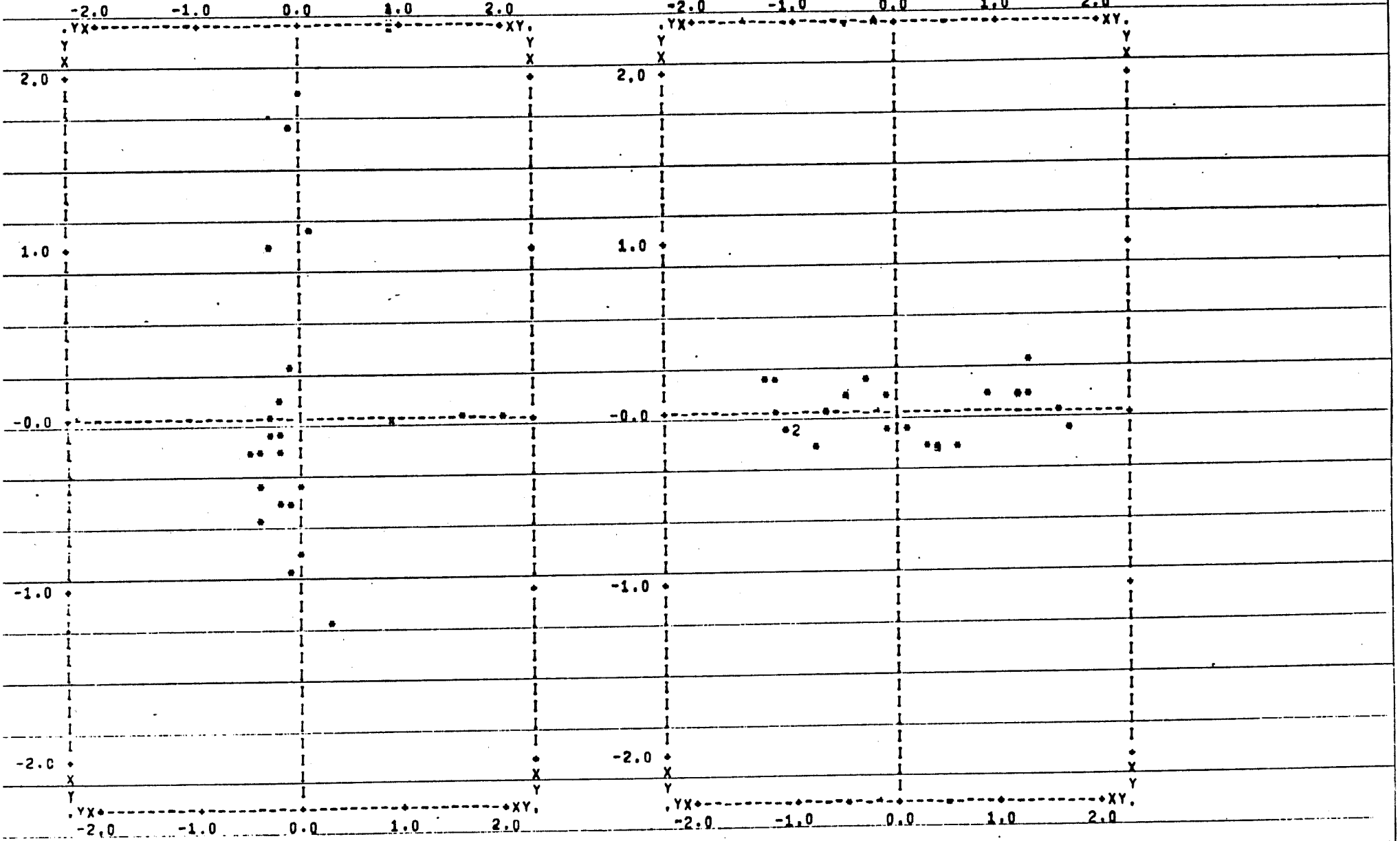
STEPWISE MULTIPLE REGRESSIONS

FILE NONAME (CREATION DATE = 05/25/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *

DEPENDENT VARIABLE KT VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE HT VARIABLE LIST 2
REGRESSION LIST 1



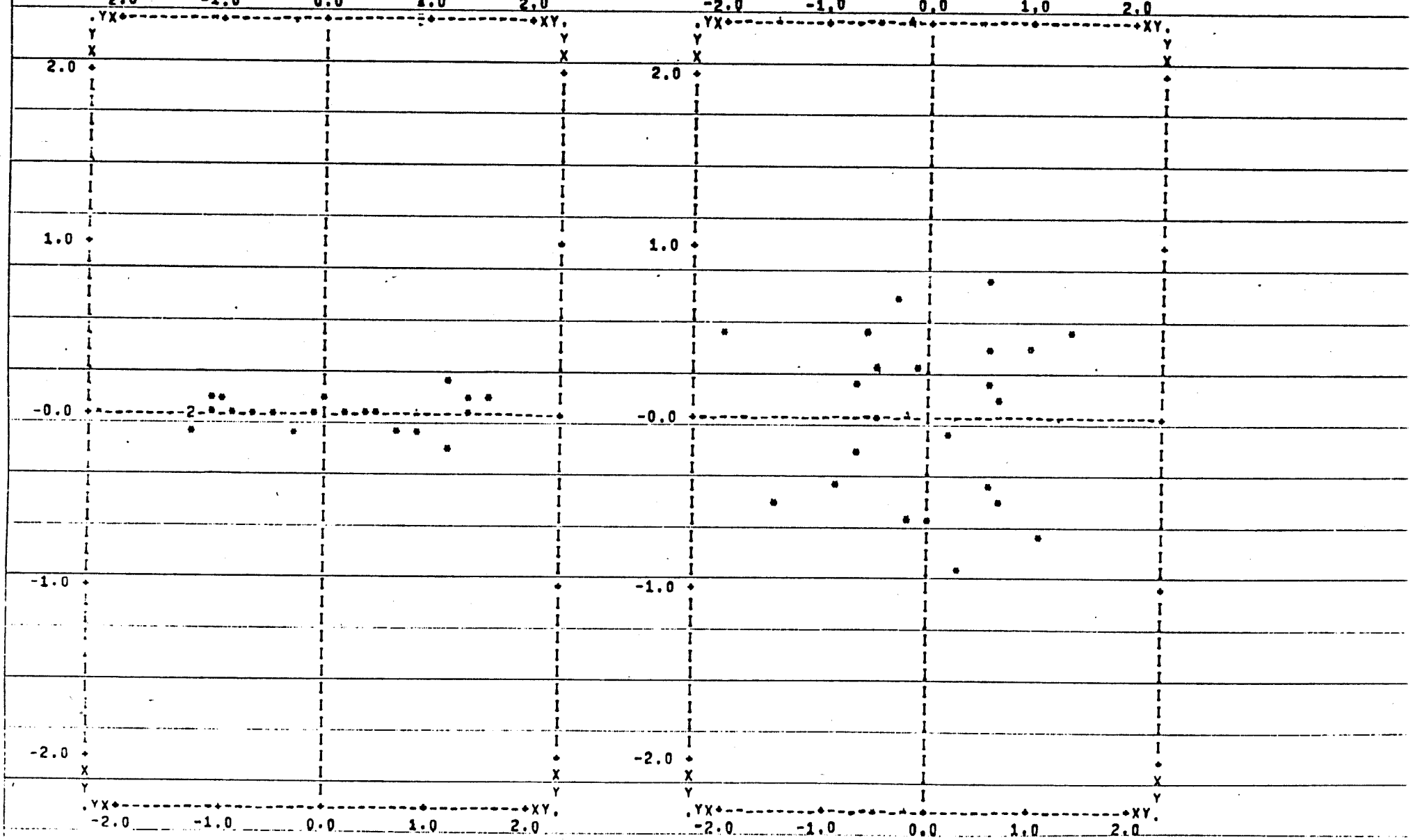
ROWS.COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS.COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

FILE NONAME (CREATION DATE = 05/25/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *

DEPENDENT VARIABLE ETH1 VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE SETH1 VARIABLE LIST 4
REGRESSION LIST 1

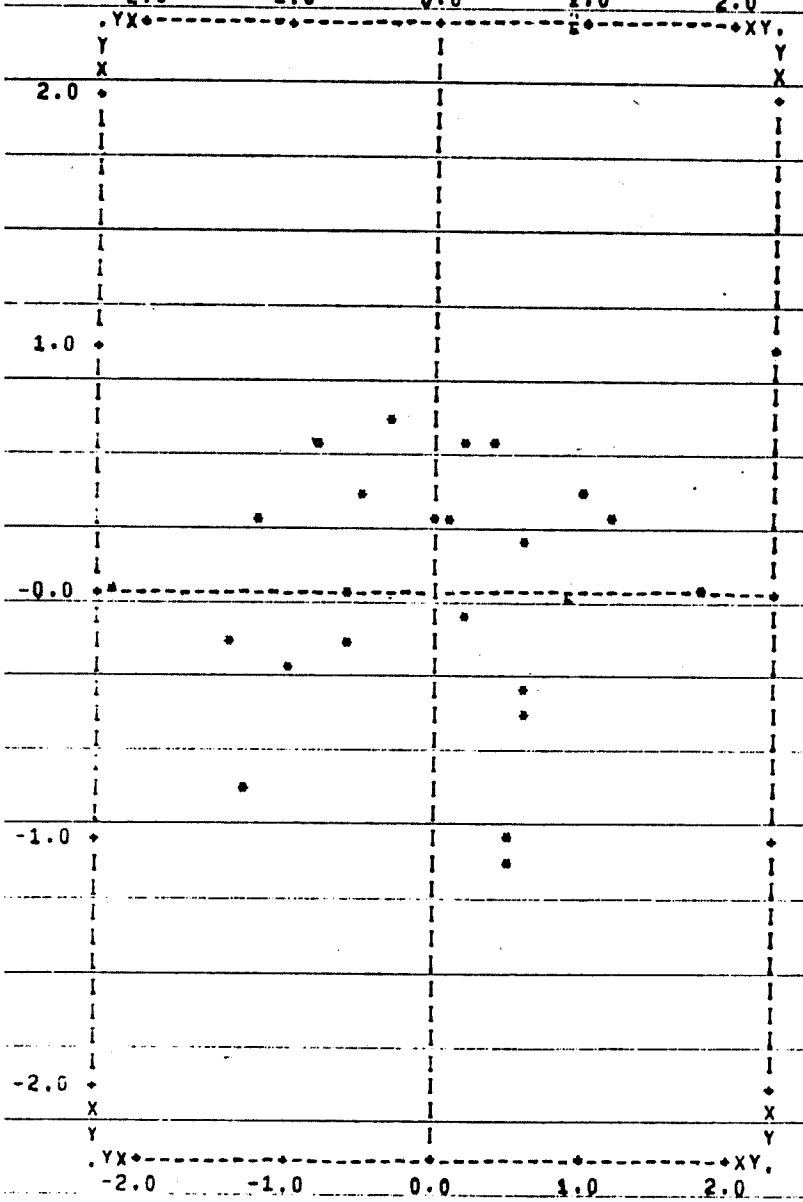


ROWS,COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS,COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

FILE NONAM (CREATION DATE = 05/25/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *

DEPENDENT VARIABLE SETM1 VARIABLE LIST 5
REGRESSION LIST 1



ROWS,COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS,COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. X

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SJ

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.46164	REGRESSION	1.	35.61250	35.61250	5.68752
R SQUARE	0.21312	RESIDUAL	21.	131.49185	6.26152	
ADJUSTED R SQUARE	0.17564					
STANDARD ERROR	2.50230					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.3609370	-0.46164	0.15135	5.688
(CONSTANT)	8.7481901			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SH	0.09409	0.08149	0.59029	0.134
SF	0.00469	0.00242	0.20913	0.000

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SH

		ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
MULTIPLE R	0.46727	REGRESSION	2.	36.48574	18.24287	2.79330
R SQUARE	0.21834	RESIDUAL	20.	130.61860	6.53093	
ADJUSTED R SQUARE	0.14018					
STANDARD ERROR	2.55557					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.4080242	-0.52187	0.20118	4.113
SH	0.0268722	0.09409	0.07349	0.134
(CONSTANT)	8.8080553			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SF	-0.07124	-0.03367	0.17465	0.022

FILE NONA (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. X

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SF

MULTIPLE R	0.46822	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.21923	REGRESSION	3.	36.63385	12.21128	1.77829
ADJUSTED R SQUARE	0.09595	RESIDUAL	19.	130.47050	6.86687	
STANDARD ERROR	2.62047					

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.3671093	-0.46954	0.34666	1.121
SH	0.0317894	0.11131	0.08246	0.149
SF	-0.0955837	-0.07124	0.65085	0.022
(CONSTANT)	9.0412775			

---------- 4 VARIABLES NOT IN THE EQUATION ----------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. X

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SJ	0.46164	0.21312	0.21312	-0.46164	-0.3671093	-0.46954
SH	0.46727	0.21834	0.00523	-0.23995	0.0317894	0.11131
SF	0.46822	0.21923	0.00089	-0.40956	-0.0955837	-0.07124
(CONSTANT)					9.0412775	

FILE NONAME (CREATION DATE = 05/30/79)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. SX

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SJ

MULTIPLE R	0.44029	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.19386	REGRESSION	1.	0.13242	0.13242	5.05005
ADJUSTED R SQUARE	0.15547	RESIDUAL	21.	0.55065	0.02622	
STANDARD ERROR	0.16193					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.0220093	-0.44029	0.00979	5.050
(CONSTANT)	0.1761816			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SH	0.29029	0.24841	0.59029	1.315
SF	0.64789	0.33000	0.20913	2.444

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SF

MULTIPLE R	0.53070	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.28165	REGRESSION	2.	0.19238	0.09619	3.92071
ADJUSTED R SQUARE	0.20981	RESIDUAL	20.	0.49069	0.02453	
STANDARD ERROR	0.15663					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.0508110	-1.01647	0.02072	6.016
SF	0.0555806	0.64789	0.03555	2.444
(CONSTANT)	0.0469359			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SH	0.16010	0.13263	0.49297	0.340

FILE NONAME (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 2
REGRESSION LIST 1.

DEPENDENT VARIABLE.. SX

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SH

MULTIPLE R	0.54248	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.29428	REGRESSION	3.	0.20102	0.06701	2.64098
ADJUSTED R SQUARE	0.18285	RESIDUAL	19.	0.48206	0.02537	
STANDARD ERROR	0.15928					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SJ	-0.0510785	-1.02182	0.02107	5.876
SF	0.0462112	0.53867	0.03956	1.364
SH	0.0029235	0.16010	0.00501	0.340
(CONSTANT)	0.0752361			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONE (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * * *

VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. SX

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SJ	0.44029	0.19386	0.19386	-0.44029	-0.0510785	-1.02182
SF	0.53070	0.28165	0.08779	-0.25606	0.0462112	0.53867
SH	0.54248	0.29428	0.01264	-0.11047	0.0029235	0.16010
(CONSTANT)					0.0752361	

FILE NONAME (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE.. Z

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SQ

MULTIPLE R	0.51399	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.26410	REGRESSION	1.	25.21151	25.21151	7.53968
ADJUSTED R SQUARE	0.22914	RESIDUAL	21.	70.22067	3.34384	
STANDARD ERROR	1.82862					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SQ	114.4868892	0.51399	41.69454	7.540
(CONSTANT)	-1.8809901			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SP	-0.04098	-0.04761	0.99334	0.045
SR	-0.05187	-0.06047	0.99998	0.073

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SR

MULTIPLE R	0.51660	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.26687	REGRESSION	2.	25.46827	12.73413	3.64020
ADJUSTED R SQUARE	0.19356	RESIDUAL	20.	69.96391	3.49820	
STANDARD ERROR	1.87035					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SQ	114.5356680	0.51421	42.64639	7.213
SR	-3.4308017	-0.05187	12.66350	0.073
(CONSTANT)	-1.8582300			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SP	-0.04121	-0.04797	0.99331	0.044

FILE NONA (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE.. Z

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SP

MULTIPLE R	0.51823	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.26856	REGRESSION	3.	25.62929	8.54310	2.32539
ADJUSTED R SQUARE	0.15307	RESIDUAL	19.	69.80288	3.67384	
STANDARD ERROR	1.91673					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SQ	115.2852809	0.51757	43.85032	6.912
SR	-3.4432761	-0.05206	12.97766	0.070
SP	-0.0439798	-0.04121	0.21007	0.044
(CONSTANT)	-1.8389355			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/30/79)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * VARIABLE LIST 3
REGRESSION LIST 1

DEPENDENT VARIABLE.. Z

SUMMARY TABLE

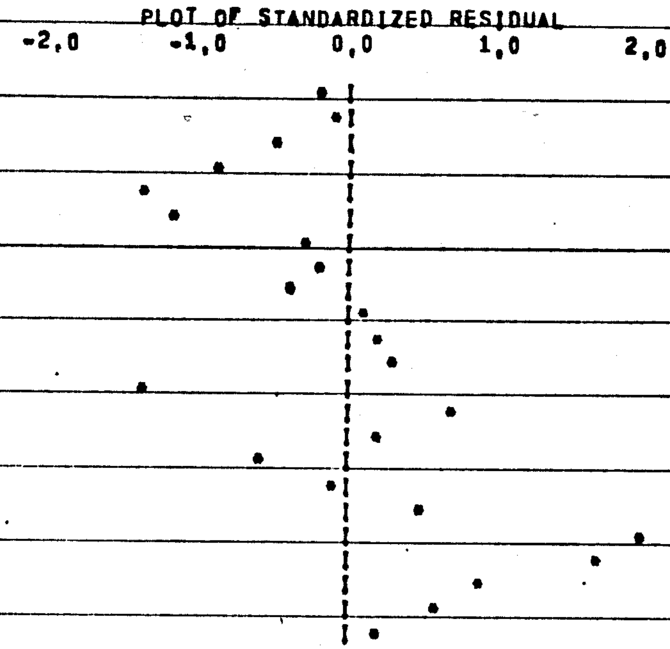
VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SQ	0.51399	0.26418	0.26418	0.51399	115.28528809	0.51757
SR	0.51660	0.26687	0.00269	-0.04970	-3.4432761	-0.05206
SP	0.51823	0.26856	0.00169	0.00126	-0.0439798	-0.04121
(CONSTANT)					-1.8389355	

FILE NONA (CREATION DATE = 05/30/79) 05/30/79 PAGE 17

* M U L T I P L E R E G R E S S I O N *

DEPENDENT VARIABLE Z FROM VARIABLE LIST 3
REGRESSION LIST 1

SEQNUM	OBSERVED Z	PREDICTED Z	RESIDUAL
1	-1.300000	-0.9708117	-0.3291883
2	-1.000000	-0.7145384	-0.2854616
3	-3.200000	-2.115588	-1.084412
4	-3.600000	-1.797264	-1.802736
5	-4.000000	-1.070870	-2.929130
6	-4.500000	-1.948835	-2.551165
7	-3.400000	-2.872432	-0.5275685
8	-2.600000	-2.108192	-0.4918080
9	-2.100000	-1.170533	-0.9294669
10	-1.000000	-1.160317	0.1603169
11	0.1000000	-0.3589493	0.4589493
12	-0.4000000	-1.051227	0.6512274
13	-0.3000000	2.537797	-2.837797
14	0.1000000	-1.267083	1.367083
15	-1.600000	-1.974903	0.3749029
16	-2.400000	-1.153015	-1.246985
17	-1.000000	-0.7388923	-0.2611077
18	1.400000	0.3162294	1.083771
19	3.900000	-0.2234416	4.123442
20	2.700000	-0.8851655	3.585165
21	0.2000000	-1.740827	1.940827
22	-0.1000000	-1.312213	1.212213
23	0.3000000	-0.1892898E-01	0.3189290

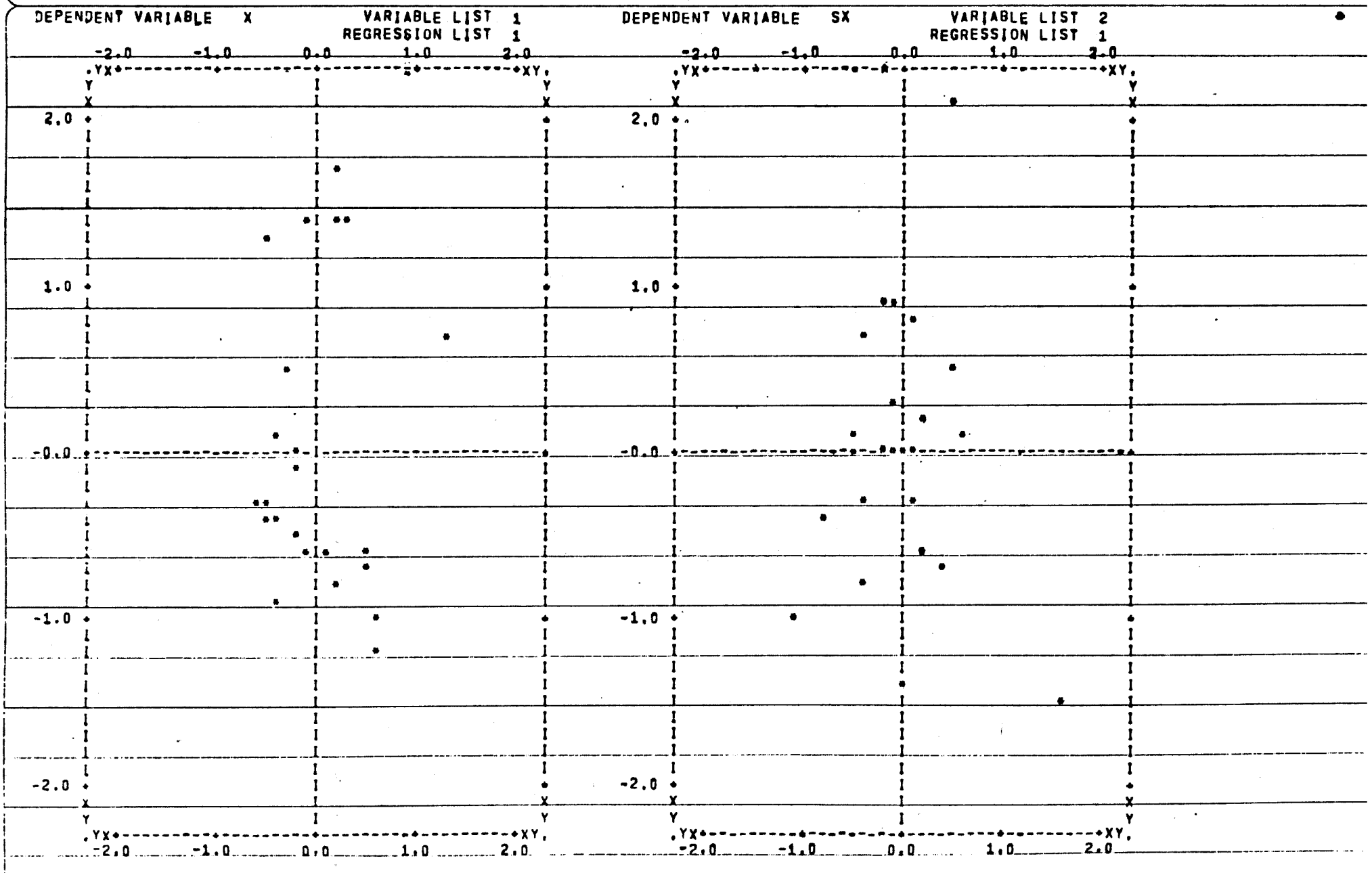


DURBIN-WATSON TEST OF RESIDUAL DIFFERENCES COMPARED BY CASE ORDER (SEQNUM).

VARIABLE LIST 1,	REGRESSION LIST 1.	DURBIN-WATSON TEST	0.28266
VARIABLE LIST 2,	REGRESSION LIST 1.	DURBIN-WATSON TEST	1.71165
VARIABLE LIST 3,	REGRESSION LIST 1.	DURBIN-WATSON TEST	0.83064

FILE NONAME (CREATION DATE = 05/30/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *



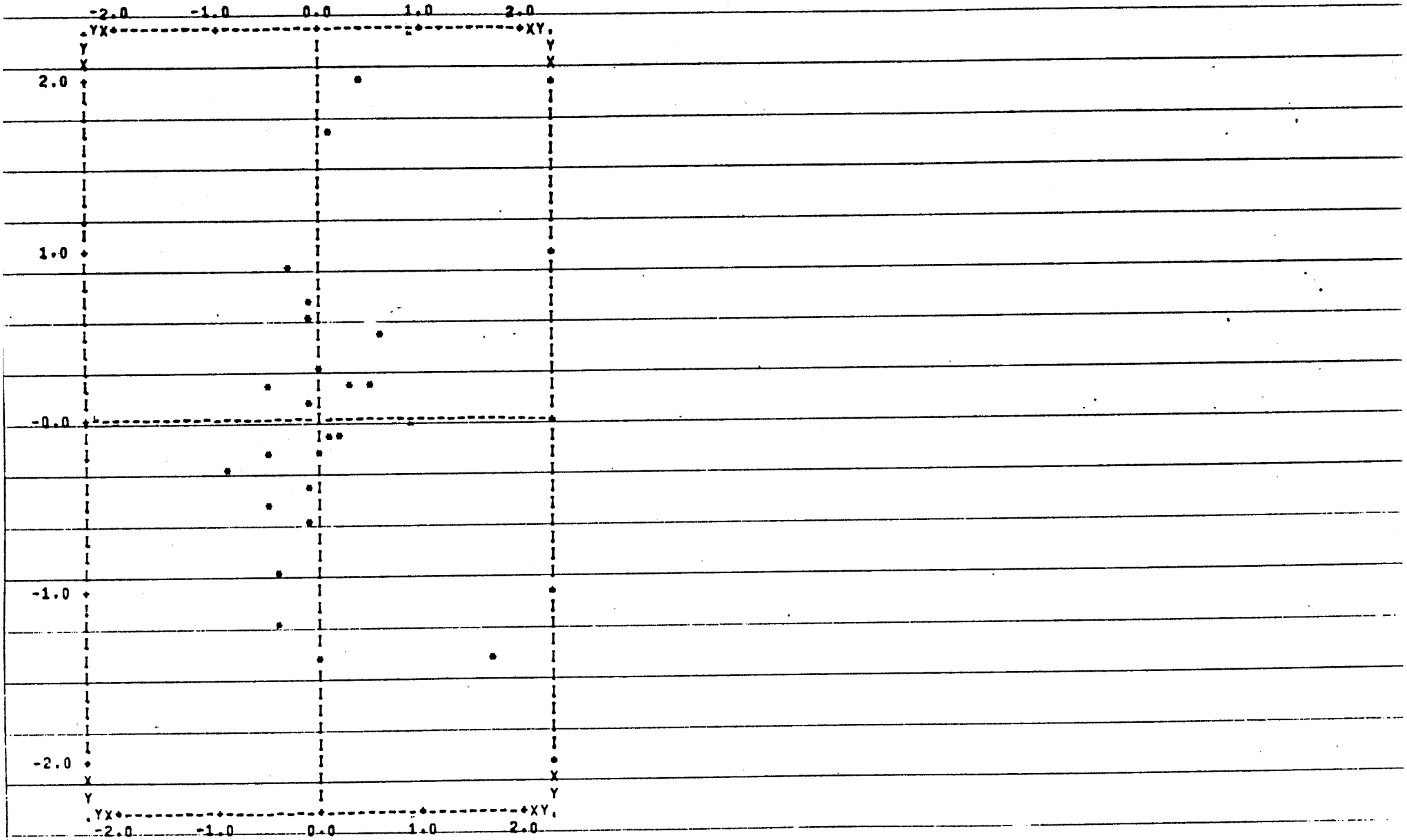
ROWS.COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS.COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

STEPWISE MULTIPLE REGRESSION

FILE NONA (CREATION DATE = 05/30/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *

DEPENDENT VARIABLE Z VARIABLE LIST 3
REGRESSION LIST 1



ROWS,COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS,COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

FILE NONAME (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SX

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SHTM1

MULTIPLE R	0.60046	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.36055	REGRESSION	1.	0.24613	0.24613	11.27706
ADJUSTED R SQUARE	0.32858	RESIDUAL	20.	0.43652	0.02183	
STANDARD ERROR	0.14774					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SHTM1	0.0110525	0.60046	0.00329	11.277
(CONSTANT)	0.0051135			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SFTM1	0.25194	0.22296	0.50082	0.994
SJTM1	0.23803	0.22958	0.59484	1.057

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SJTM1

MULTIPLE R	0.62790	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.39426	REGRESSION	2.	0.26914	0.13457	6.18318
ADJUSTED R SQUARE	0.33049	RESIDUAL	19.	0.41352	0.02176	
STANDARD ERROR	0.14753					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SHTM1	0.0082637	0.44895	0.00426	3.761
SJTM1	0.0119409	0.23803	0.01161	1.057
(CONSTANT)	-0.0338715			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SFTM1	0.12239	0.06594	0.17584	0.079

STEPWISE MULTIPLE REGRESSION

FILE NONAME (CREATION DATE = 05/30/79)

* MULTIPLE REGRESSION * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SX

VARIABLE(S) ENTERED ON STEP NUMBER 3.. SFTM1

MULTIPLE R	0.62999	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.39689	REGRESSION	3.	0.27094	0.09031	3.94842
ADJUSTED R SQUARE	0.29637	RESIDUAL	18.	0.41172	0.02287	
STANDARD ERROR	0.15124					

VARIABLES IN THE EQUATION

VARIABLE	B	BETA	STD ERROR B	F
SHTM1	0.0077320	0.42006	0.00476	2.636
SJTM1	0.0074028	0.14757	0.02009	0.136
SFTM1	0.0106085	0.12239	0.03784	0.079
(CONSTANT)	-0.0600827			

VARIABLES NOT IN THE EQUATION

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F

MAXIMUM STEP REACHED

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/30/79)

* M U L T I P L E R E G R E S S I O N * * * * * * * * * * * * * * VARIABLE LIST 1
REGRESSION LIST 1

DEPENDENT VARIABLE.. SX

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SWTM1	0.60046	0.36055	0.36055	0.60046	0.0077320	0.42006
SJTM1	0.62790	0.39426	0.03370	0.52380	0.0074028	0.14757
SFTM1	0.62999	0.39689	0.00263	0.55042	0.0106085	0.12239
(CONSTANT)					-0.0600827	

STEPWISE MULTIPLE REGRESSION

FILE NONAME (CREATION DATE = 05/30/79)

* M U L T I P L E   R E G R E S S I O N * * * * * * * * * * * * * VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. Z

VARIABLE(S) ENTERED ON STEP NUMBER 1.. SQTM1

MULTIPLE R	0.53631	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.28763	REGRESSION	1.	27.42830	27.42830	8.07542
ADJUSTED R SQUARE	0.25201	RESIDUAL	20.	67.93033	3.39652	
STANDARD ERROR	1.84296					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SQTM1	123.2430522	0.53631	43.36905	8.075
(CONSTANT)	-1.8742247			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SPTM1	-0.04088	-0.04821	0.99084	0.044
SRTM1	-0.01317	-0.01548	0.98453	0.005

* *

VARIABLE(S) ENTERED ON STEP NUMBER 2.. SPTM1

MULTIPLE R	0.53786	ANALYSIS OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE	F
R SQUARE	0.28929	REGRESSION	2.	27.58621	13.79311	3.86690
ADJUSTED R SQUARE	0.21448	RESIDUAL	19.	67.77242	3.56697	
STANDARD ERROR	1.88864					

------------------ VARIABLES IN THE EQUATION ------------------

VARIABLE	B	BETA	STD ERROR B	F
SQTM1	124.1422500	0.54023	44.64895	7.731
SPTM1	-0.0436504	-0.04088	0.20746	0.044
(CONSTANT)	-1.8550804			

------------- VARIABLES NOT IN THE EQUATION -------------

VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
SRTM1	-0.01194	-0.01405	0.98364	0.004

F-LEVEL OR TOLERANCE-LEVEL INSUFFICIENT FOR FURTHER COMPUTATION

STATISTICS WHICH CANNOT BE COMPUTED ARE PRINTED AS ALL NINES.

FILE NONAME (CREATION DATE = 05/30/79)

• MULTIPLE REGRESSION • • • • • • • • • • • • • VARIABLE LIST 2
REGRESSION LIST 1

DEPENDENT VARIABLE.. Z

SUMMARY TABLE

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
SQTM1	0.53631	0.28763	0.28763	0.53631	124.1422500	0.54023
SPTM1	0.53786	0.28929	0.00166	0.01083	-0.0436504	-0.04088
(CONSTANT)					-1.8550804	

**** 1K WORDS OF WORKSPACE ADDED, INCREASE LIMITS FOR NEXT RUN ****

***** REGRESSION PROBLEM REQUIRES 2176 WORDS WORKSPACE INCLUDING RESIDUALS *****

FILE NONAME (CREATION DATE = 05/30/79)

MULTIPLE REGRESSION

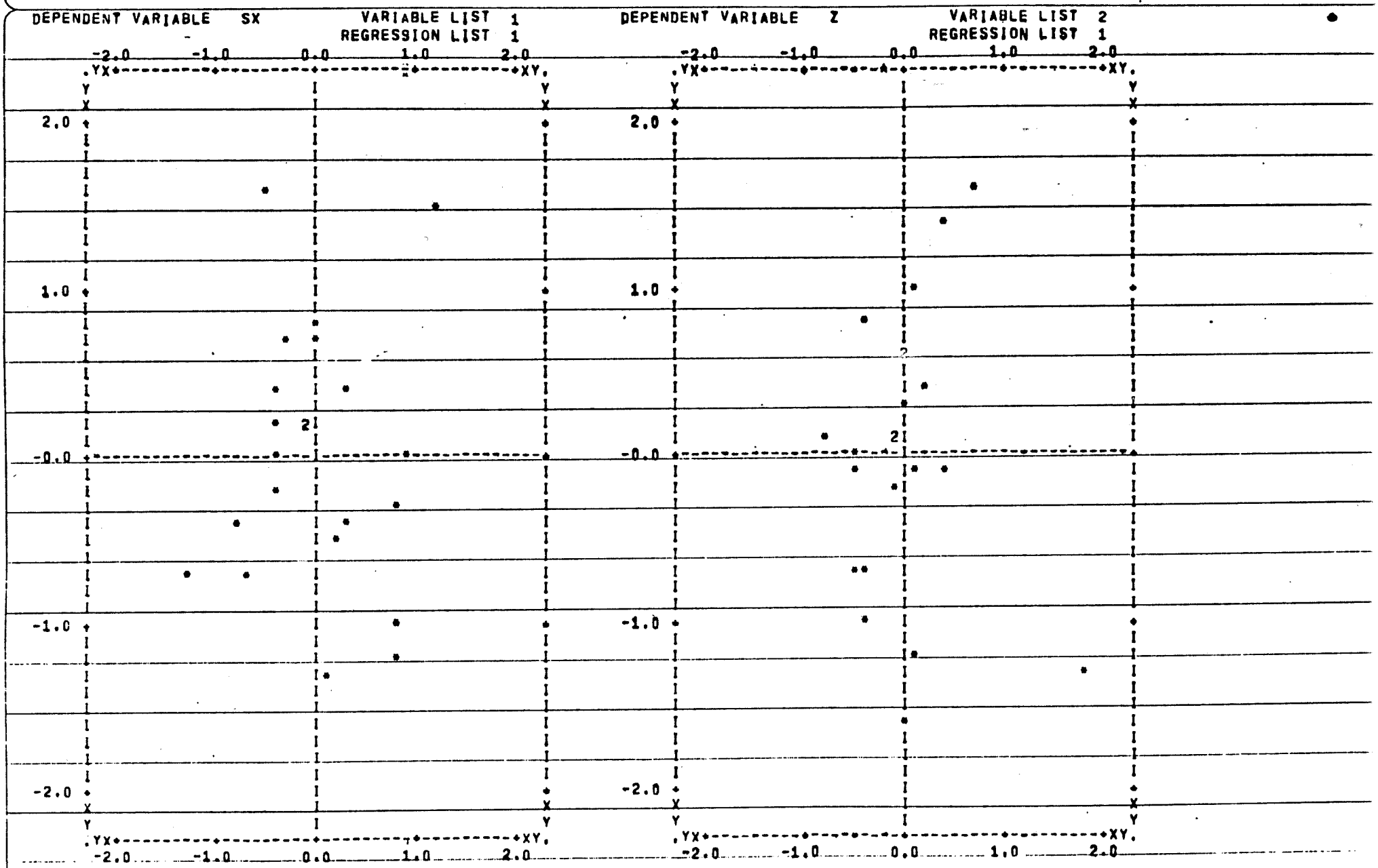
DEPENDENT VARIABLE Z FROM VARIABLE LIST 2
REGRESSION LIST 1

SEQNUM	OBSERVED Z	PREDICTED Z	RESIDUAL	PLOT OF STANDARDIZED RESIDUAL -2.0 -1.0 0.0 1.0 2.0
1	-1.000000	-0.8933694	-0.1066306	
2	-3.200000	-0.7370581	-2.462942	
3	-3.600000	-2.104674	-1.495326	
4	-4.000000	-1.854731	-2.145269	
5	-4.500000	-0.9871323	-3.512868	
6	-3.400000	-1.813787	-1.586213	
7	-2.600000	-2.760917	0.1609171	
8	-2.100000	-2.111004	0.1100377E-01	
9	-1.000000	-1.133362	0.1333617	
10	0.1000000	-1.126640	1.226639	
11	-0.4000000	-0.2632310	-0.1367690	
12	-0.3000000	-0.9983941	0.6983941	
13	0.1000000	2.851412	-2.751412	
14	-1.600000	-1.238909	-0.3610912	
15	-2.400000	-2.115412	-0.2845876	
16	-1.000000	-1.238472	0.2384723	
17	1.400000	-0.7407248	2.140725	
18	3.900000	0.4993882	3.400612	
19	2.700000	-0.2005053	2.900505	
20	0.2000000	-0.6745503	0.8745503	
21	-0.1000000	-1.860231	1.760231	
22	0.3000000	-0.9976957	1.297696	

DURBIN-WATSON TEST OF RESIDUAL DIFFERENCES COMPARED BY CASE ORDER (SEQNUM).
VARIABLE LIST 1, REGRESSION LIST 1. DURBIN-WATSON TEST 1.32770
VARIABLE LIST 2, REGRESSION LIST 1. DURBIN-WATSON TEST 0.70512

FILE NONE (CREATION DATE = 05/30/79)

* * * * * * * PLOT STANDARDIZED RESIDUAL (DOWN) -- PREDICTED STANDARDIZED DEPENDENT VARIABLE (ACROSS) * * * * * * *



ROWS,COLUMNS Y VALUES OUTSIDE (-3.0,3.0) ROWS,COLUMNS X VALUES IN (-3.0,-2.05) OR (2.05,3.0)

APPENDIX B

The Klein-Goldberger Model

EQUATIONS of the Revised Klein Goldberger Model

*(18.1) $C_d - 0.7C_{d,-1} = \underset{(0.047)}{0.230}(Y - 0.7Y_{-1}) - \underset{(0.096)}{0.105}C_{d,-1} - 4.51$

*(18.2) $C_{ns} = \underset{(0.050)}{0.228}Y + \underset{(0.065)}{0.752}C_{ns,-1} - 1.468$

*(18.3) $I_h = \underset{(0.0088)}{0.0517}Y - \underset{(0.0213)}{0.0402}i_{3,-1} + \underset{(0.112)}{0.335}I_{h,-1} - 1.853$

*(18.4) $I_i = \underset{(0.021)}{0.137}(X - \Delta I_i) + \underset{(0.100)}{0.396}I_{i,-1} - 24.702$

*(18.5) $F_i = \underset{(0.0068)}{0.0284}X - \underset{(4.06)}{10.14}(p_i - p) + \underset{(0.149)}{0.463}F_{i,-1} - 0.942$

*(18.6) $[X - (W_g/p)] - \underset{(0.065)}{0.695}[X - (W_g/p)]_{-1} = \underset{(1.086)}{0.364}(I_p + I_h) + 3.532[(N_w - N_g + N_s) - 0.95(N_w - N_g + N_s)_{-1}] + \underset{(0.614)}{1.335}(h - 0.95h_{-1}) - 6.483$

*(18.7) $h = \underset{(0.103)}{-0.450}\Delta w - \underset{(0.272)}{1.996}(N_L - N_w - N_s) + 1.157$

*(18.8 $[(W - W_g)/p)] = \underset{(0.026)}{0.413}[X - (W_g/p)] + \underset{(0.048)}{0.282}[(W - W_g)/p]_{-1} - 10.607$

*(18.9) $\Delta w = \underset{(0.471)}{-1.697}(N_L - N_w - N_s) + \underset{(0.520)}{1.116}(\Delta p)_{-1} + 0.184$

*(18.10) $i_L = \underset{(0.051)}{0.157}i_3 + \underset{(0.066)}{0.835}(i_L)_{-1} + 0.335$

*(18.11) $RE = \underset{(0.052)}{0.788}(P_{cb} - T_c) - \underset{(0.100)}{0.667}(P_{cb} - T_c - RE)_{-1} - 0.148$

*(18.12) $PB = \underset{(0.0074)}{0.0107}pX + \underset{(0.082)}{0.898}(PB)_{-1} + 0.674$

*(18.13) $RI = \underset{(0.0095)}{0.0623}p(I_p + I_h) - \underset{(0.0337)}{0.0230}\Delta i_L + \underset{(0.025)}{0.938}(RI)_{-1} + 0.394$

*(18.14) $I_p - \underset{(0.0158)}{0.951}I_{p,-1} = \underset{(0.56)}{0.0656}(X - W_g)_{-1} - \underset{(0.150)}{2.11}(i_L)_{-1} - 0.590I_{p,-1} + 9.329$

*(18.15) $D = \underset{(0.0016)}{0.0492}\sum_{i=1}^{20} p_{-i}(I_p + I_h)_{-i} + \underset{(0.0063)}{0.0856}Du + 1.411$

*(18.16) $i_3 = \underset{(0.082)}{1.145}i_d - \underset{(0.335)}{0.815}RR_{-1} + \underset{(0.186)}{0.533}Du - 0.511$

*(18.17) $X = C_d + C_{ns} + I_p + I_h + \Delta I_i + G + F_e - F_i$

*(18.18) $pY = pX - D - T_i - RE - T_c - T$

EQUATIONS of the Revised Klein Goldberger Model (*Continued*)

[4](18.19) $P_{cb} = pX - D - T_i - W - RI - PB$

[5](18.20) $W = whN_w$

[3] The seven basic equations in the outline of the Keynesian system presented at the beginning of the chapter.
[4] The additional aggregate demand equations.
[5] The additional factor share equations.
[6] Other equations (hours and interest rates).

DEFINITIONS OF VARIABLES

C_d	consumption of durables, billions of 1954 dollars
C_{nd}	consumption of nondurables and services, billions of 1954 dollars
D	capital consumption allowances (depreciation), billions of 1954 dollars
*Du	dummy variable: 0 for 1929–1946; 1 for 1947–1962
*F_e	exports, billions of 1954 dollars
F_i	imports, billions of 1954 dollars
*G	government purchases of goods and services, billions of 1954 dollars
h	index of hours worked per week, 1954 = 1.00
*i_d	average discount rate at all Federal Reserve Banks, percent
I_h	residential construction, billions of 1954 dollars
I_i	stock of inventories, billions of 1954 dollars
i_L	average yield on corporate bonds (Moody's), percent
I_p	investment in plant and equipment, billions of 1954 dollars
i_s	yield on prime commercial paper, four to six months, percent
*N_g	government employees, millions
*N_L	total labor force, millions
*N_s	self-employed workers, millions
N_w	wage and salary workers, millions
p	implicit GNP deflator, 1954 = 1.00
PB	proprietors' income, billions of current dollars
P_{cb}	corporate profits including inventory valuation adjustment, billions of current dollars
*p_i	implicit price deflator for imports, 1954 = 1.00
RE	retained earnings including inventory valuation adjustment, billions of current dollars
RI	rental and net interest income, billions of current dollars
*RR	year-end ratio of member banks' excess to required reserves
†T	personal taxes + contributions for social insurance − government and business transfer payments − interest on government debt, billions of current dollars
†T_c	corporate profits taxes, billions of current dollars
*T_i	reconciling item between net national product and national income, billions of current dollars
W	wages and salaries and supplements, billions of current dollars
w	annual wage rate of all employees, thousands of dollars per year
*W_g	wage bill of government employees, billions of current dollars
X	GNP, billions of 1954 dollars
Y	personal disposable income, billions of 1954 dollars

* Exogenous variables.
† Functions are not given for these variables because of frequent changes in the tax laws.

APPENDIX C

The Wharton Econometric Forecasting Unit Model

STOCHASTIC Equations of the Wharton EFU Model

Equation No.	Equation	R^2	S_e	d	Page Ref.
(15.1)	$\frac{C_{ns}}{Y} = \underset{(0.0485)}{0.2273} - 0.4590\left[\frac{\Delta Y}{Y} + 0.75\left(\frac{\Delta Y}{Y}\right)_{-1} + 0.50\left(\frac{\Delta Y}{Y}\right)_{-2} + 0.25\left(\frac{\Delta Y}{Y}\right)_{-3}\right] + \underset{(0.0512)}{0.7232}\ \frac{1}{4}\sum_{i=1}^{4}\left(\frac{C_{ns}}{Y}\right)_{-i}$	0.825	0.0048	1.58	62
(15.2)	$C_{ns} = \underset{(0.0274)}{-11.52} + \underset{(0.0251)}{0.1570}Y - 0.0574(K_{ns})_{-1}$	0.965	0.94	1.29	168
(15.2a)	$C_{ns} = \underset{(0.0370)}{-14.19} + \underset{(0.0333)}{0.1157}Y - \underset{(0.0327)}{0.0209}(K_{ns})_{-1} + 0.0552(C_d^*)_{-1}$	0.964	0.95	1.28	169
(15.3)	$C_s = \underset{(0.0228)}{48.54} + \underset{(0.175)}{0.1346}[Y - (Tr/p_c)] - \underset{(10.20)}{54.19}(p_s/p_c) - \underset{(0.458)}{0.430}Un - \underset{(0.478)}{4.129}\delta_s + \underset{(0.0180)}{1.835}Cr - 0.0744(K_s)_{-1}$	0.916	1.27	1.13	168
(15.3a)	$C_s = \underset{(0.0265)}{30.27} + \underset{(0.234)}{0.1055}[Y - (Tr/p_c)] - \underset{(10.59)}{47.54}(p_s/p_c) - \underset{(0.609)}{0.097}Un - \underset{(0.647)}{3.269}\delta_s + 0.899Cr - \underset{(0.0226)}{0.0449}(K_s)_{-1} + \underset{(0.056)}{0.120}(C_d^*)_{-1}$	0.917	1.26	1.06	169
(15.4)	$I_{pm} = \underset{(2.30)}{-17.45} + \underset{(0.0139)}{24.59}Cp_{-1} + 0.1308\sum_{i=0}^{7}A_i(X_m)_{-i-2} + \underset{(0.0610)}{0.1644}\sum_{i=0}^{7}A_i(L_m)_{-i-2} - \underset{(0.292)}{1.158}\sum_{i=0}^{7}A_i(i_L)_{-i-2} - \underset{(0.0065)}{0.0248}\sum_{i=0}^{7}A_i(K_m)_{-i-2}$	0.895	0.68	0.58	135
(15.4a)	$I_{pm} = \underset{(1.86)}{-11.43} + \underset{(0.0105)}{15.62}Cp_{-1} + 0.0892\sum_{i=0}^{7}A_i(X_m)_{-i-2} + \underset{(0.0416)}{0.1069}\sum_{i=0}^{7}A_i(L_m)_{-i-2} - \underset{(0.0044)}{0.0271}\sum_{i=0}^{7}A_i(K_m)_{-i-2} + \underset{(0.0454)}{0.3954}ANP_m - \underset{(0.2189)}{0.3201}\sum_{i=0}^{7}A_i(i_L)_{-i-2}$	0.953	0.46	1.17	—

STOCHASTIC Equations of the Wharton EFU Model (*Continued*)

Equation No.	Equation	R^2	S_e	d	Page Ref.
(15.5)	$I_{pr} = \underset{(0.0081)}{1.49} + \underset{(0.0032)}{0.0140}[(Z_{-1} + Z_{-2})/2] - 0.0043 \times [(K_{r,-1} + K_{r,-2})/2] + \underset{(0.0113)}{0.0429} \sum_{i=0}^{7} A_i Z_{-i-3} - \underset{(0.2695)}{2.1042} \sum_{i=0}^{7} A_i (i_L)_{-i-3}$	0.810	0.55	0.65	139
(15.5a)	$I_{pr} = \underset{(0.0083)}{-0.40} + \underset{(0.0034)}{0.0061}[(Z_{-1} + Z_{-2})/2] - 0.0082 \times [(K_{r,-1} + K_{r,-2})/2] + \underset{(0.0108)}{0.0443} \sum_{i=0}^{7} A_i Z_{-i-3} - \underset{(0.3291)}{1.5519} \sum_{i=0}^{7} A_i (i_L)_{-i-3} + \underset{(0.0612)}{0.16474} NP_a$	0.828	0.52	0.79	—
(15.6)	$I_{pr} = \underset{(0.0278)}{-35.72} + \underset{(0.0170)}{0.1742} C_{-1} - \underset{(0.0475)}{0.0563} K_{r,-1} + 0.0363 \times \sum_{i=0}^{7} A_i C_{-i-3} + \underset{(0.461)}{2.396} \sum_{i=0}^{7} A_i (i_L - i_a)_{-i-3}$	0.930	1.05	0.73	139
(15.7)	$I_h = \underset{(0.0033)}{58.26} + \underset{(4.76)}{0.0249} Y - 45.52(p_m/p_r)_{-3} + \underset{(0.282)}{1.433}(i_L - i_a)_{-3}$	0.820	1.15	0.36	197
(15.7a)	$I_h = \underset{(0.0017)}{33.65} + \underset{(2.44)}{0.0101} Y - 26.48(p_m/p_r)_{-3} + \underset{(0.146)}{0.261}(i_L - i_a)_{-3} + \underset{(0.00054)}{0.00851} I^*_{h,-1}$	0.964	0.51	1.63	—
(15.8)	$\Delta I_{im} = \underset{(0.0272)}{-5.03} + \underset{(0.0224)}{0.0718} S_{m,-1} - \underset{(0.083)}{0.0539} I_{im,-2} + \underset{(0.040)}{0.422} \Delta U_{-1} + 0.203(U_{-2} - U_{-4}) + \underset{(0.603)}{2.074} STR$	0.768	1.62	1.20	219
(15.9)	$\Delta I_{in} = \underset{(0.0456)}{-14.94} + \underset{(0.0476)}{0.0668}(S_n)_{-1} - \underset{(0.0634)}{0.1173}(I_{in})_{-2} + \underset{(0.0686)}{0.2180}(C_d)_{-1} + 0.3325 \Delta X_m + \underset{(11.82)}{40.43}[p_m - (p_m)_{-2}]$	0.610	1.33	1.59	219

STOCHASTIC Equations of the Wharton EFU Model (*Continued*)

Equation No.	Equation	R^2	S_e	d	Page Ref.
(15.10)	$\frac{F_{sf}}{N} = \underset{(0.0013)}{0.0117} + \underset{(0.0015)}{0.0041}(Y/N) - 0.0041(p_{sf}/p_f)$	0.305	0.0014	1.69	224
(15.11)	$F_{im} = \underset{(0.0022)}{3.51} + \underset{(0.0194)}{0.0329}S_m + \underset{(0.74)}{0.0960}\Delta I_{im} - 2.14(p_{im}/p_m)$	0.900	0.32	0.76	224
(15.12)	$F_{ie} = \underset{(0.0073)}{-2.57} + \underset{(1.48)}{0.0293}Y - 1.97(p_{ie}/p_m) + \underset{(0.1109)}{0.6014}$ $\times \frac{1}{4}\sum_{i=1}^{4}(F_{ie})_{-i}$	0.989	0.41	0.79	224
(15.13)	$F_e = \underset{(0.0128)}{-38.88} + \underset{(4.78)}{0.1665}X_{wt} + 34.33(p_{wt}/p_e)$ $+ \underset{(0.0534)}{0.4663}\frac{1}{4}\sum_{i=1}^{4}(F_e)_{-i}$	0.976	0.89	1.26	228
(15.14)	$\ln X_m = \underset{(0.0889)}{0.645} + \underset{(0.0574)}{0.7547}\ln(Nh)_m + 0.2402\ln(K_m Cp)$ $+ \underset{(0.037)}{0.881}\text{prod}$	0.984	0.024	0.82	254
(15.15)	$\ln X'_m = 0.645 + 0.7547\ln N^C_m + 0.2402\ln K_m$ $+ 0.881\text{prod}$				
(15.16)	$h_m = \underset{(0.00021)}{0.797} + \underset{(0.00044)}{0.00076}X_m + \underset{(0.0423)}{0.00126}\Delta X_m + 0.1906Cp$ $- \underset{(0.0050)}{0.0126}wr_m$	0.711	0.0081	1.61	259
(15.17)	$wr_m - (wr_m)_{-4} = \underset{(0.0234)}{0.050} + 0.1481\frac{1}{4}\sum_{i=1}^{4}(Un - U^*)_{-i}$ $+ \underset{(0.521)}{4.824}(p_{c-1} - p_{c-4})$ $- \underset{(0.0705)}{0.1946}[(wr_m)_{-4} - (wr_m)_{-8}]$	0.657	0.0568	1.03	268
(15.18)	$p_m = \underset{(0.0890)}{-0.170} + \underset{(0.0361)}{0.5418}(W/X)_m + 0.2465Cp$ $+ \underset{(0.0063)}{0.0429}\delta_{kw} + \underset{(0.0703)}{0.6064}\frac{1}{4}\sum_{i=1}^{4}(p_m)_{-i}$	0.982	0.0098	0.60	300
(15.19)	$\ln X_m = \underset{(0.2108)}{0.270} + \underset{(0.0371)}{0.9897}\ln(Nh)_m + 0.2755\ln K_m$ $+ \underset{(0.084)}{0.082}\text{prod}$	0.976	0.022	0.55	254
(15.20)	$h_m = \underset{(0.0235)}{1.186} + \underset{(0.0011)}{0.0155}Cp - 0.0391 wr_m$	0.963	0.0069	0.78	260

STOCHASTIC Equations of the Wharton EFU Model (*Continued*)

Equation No.	Equation	R^2	S_e	d	Page Ref
(15.21)	$wr_m - (wr_m)_{-4} = 0.176 + 0.3019[wr_m - (wr_m)_{-4}]$ (0.1286) $+ 1.298[(p_c)_{-1} - (p_c)_{-4}]$ (0.777) $- 0.4741[(wr_m)_{-4} - (wr_m)_{-8}]$ (0.1154)	0.330	0.0539	0.59	269
(15.22)	$U^* = -5.42 + 1.231Un + 8.929 \frac{1}{\frac{1}{4}\sum_{i=0}^{3}(Un)_{-i}}$ (0.083) (2.939) $+ 0.3245 \frac{1}{4}\sum_{i=1}^{4}(U^*)_{-i}$ (0.0899)	0.929	0.38	1.21	269
(15.23)	$\frac{N_t^M}{N} = 0.4255 + 0.0169 \frac{1}{\frac{1}{4}\sum_{i=0}^{3}(Un)_{-i}}$ (0.0095) $+ 0.1139(N_G^M/N) - 0.000478t$ (0.1020) (0.000020)	0.952	0.0023	0.59	262
(15.24)	$D_m = 0.29 + 0.0467 \sum_{i=0}^{N}(p_k I_{pm} - D_m)_{-i} + 2.9526\delta_1$ (0.0009) (0.159)	0.988	0.43	0.28	
(15.25)	$D_r = 1.27 + 0.0205 \sum_{i=0}^{N}(p_k I_{pr} - D_r)_{-i} + 0.2498\delta_1$ (0.0003) (0.071)	0.994	0.17	0.15	
(15.26)	$D_c = 3.54 + 0.0281 \sum_{i=0}^{N}(p_k I_{pc} - D_c)_{-i}$ (0.0006)	0.962	0.56	0.21	——
(15.27)	$D_h = 2.08 + 0.0116 \sum_{i=0}^{N}(p_k I_h - D_h)_{-i}$ (0.0001)	0.993	0.25	0.07	——
*(15.28)	$T_h = -2.90 + 0.0721NI + 0.3839t$ (0.0113) (0.0557)	0.994	0.71	0.27	----
*(15.29)	$T_c = -4.26 + 0.46(P_{ch} - IVA)$				
*(15.30)	$T_r = -2.95 + 1.565(U_N \cdot N_L^{25}/100) + 0.5069t$ (0.113) (0.0059)	0.997	0.42	1.43	——
*(15.31)	$T_p = -12.8 + 0.153(PI + SCI - Tr)$				
(15.32)	$PB = 1.24 + 0.0607(\Delta pX + 0.75\Delta pX_{-1} + 0.50\Delta pX_{-2}$ (0.0067) $+ 0.25\Delta pX_{-3}) + 0.9529 \frac{1}{4}\sum_{i=1}^{4}(PB)_{-i}$ (0.0112)	0.992	0.47	0.66	285
(15.33)	$RI = -0.57 + 23.08[\Delta p_r + 0.75\Delta(p_r)_{-1} + 0.50\Delta(p_r)_{-2}$ (7.97) $+ 0.25\Delta(p_r)_{-3}] + 1.0613 \frac{1}{4}\sum_{i=1}^{4}(RI)_{-i}$ (0.0090)	0.998	0.33	0.66	285

STOCHASTIC Equations of the Wharton EFU Model (*Continued*)

Equation No.	Equation	R^2	S_e	d	Page Ref.
(15.34)	$D_f = \underset{(0.0122)}{0.17} + \underset{(0.0576)}{0.5289}\frac{1}{4}\sum_{i=1}^{4}(D_f)_{-i} + \underset{(0.0122)}{0.1103}(P_{cu} + D_m + D_r + D_s)$	0.990	0.31	1.26	286
(15.35)	$IVA = \underset{(13.40)}{219.33}\Delta p_m + 0.08$	0.785	0.98	2.32	---
†(15.36)	$RE_m = \underset{(0.0461)}{0.5810}RE - 1.12$	0.908	0.48	0.80	---
(15.37)	$X_m = \underset{(0.0442)}{0.2213}C_m + \underset{(0.206)}{1.133}C_d + \underset{(0.203)}{0.526}I_p + \underset{(0.124)}{0.397}\Delta I_r + \underset{(0.038)}{0.385}G_d - \underset{(0.0442)}{2.40}$	0.983	3.25	0.63	---
(15.38)	$X_h = \underset{(0.0024)}{0.0093}\sum_{i=0}^{4}\left(I_h - \frac{D_h}{P_h}\right)_{-i} + \underset{(0.0125)}{0.1321}Y - 7.30$	0.995	0.67	0.42	---
(15.39)	$\Delta U = \underset{(0.196)}{0.344}\Delta S_m + \underset{(0.155)}{0.670}\Delta G_d + \underset{(1.58)}{6.61}\delta_{UM} - 0.55$	0.440	2.70	1.54	---
(15.40)	$\Delta p_{ns} = \underset{(0.075)}{0.063}\Delta p_m + \underset{(0.052)}{0.130}\Delta p_{m-1} + \underset{(0.014)}{0.088}\Delta p_f + 0.0039$	0.672	0.0028	1.50	307
(15.41)	$\Delta p_{ns} = \underset{(0.143)}{0.768}\Delta p_m + \underset{(0.116)}{0.238}\Delta p_{m-1} - 0.0031$	0.682	0.0064	1.30	307
†(15.42)	$\Delta p_a = \underset{(0.125)}{0.597}\Delta p_{m-1} + 0.0012$	0.549	0.0020	1.56	307
(15.43)	$\Delta p_h = \underset{(0.143)}{0.792}\Delta p + \underset{(0.1192)}{0.3915}(I_p/X) - 0.0332$	0.564	0.0047	1.67	307
(15.44)	$\Delta p_h = \underset{(0.206)}{1.265}\Delta p + \underset{(0.00037)}{0.00143} \times [(I_p + I_h) - (I_p + I_h)_{-2}] - 0.0017$	0.439	0.0075	1.71	307
(15.45)	$\Delta p_a = \underset{(0.233)}{0.646}\Delta p_m + \underset{(0.189)}{0.488}\Delta p_{m-1} - 0.0022$	0.496	0.0105	1.46	307
(15.46)	$i_s = \underset{(0.034)}{0.994}i_d - \underset{(0.0118)}{0.0895}(FR) + 0.42$	0.961	0.19	1.02	317
(15.47)	$i_L = \underset{(0.028)}{0.086}i_s + \underset{(0.037)}{0.889}(i_L)_{-1} + 0.21$	0.972	0.12	1.79	318

* Estimated for shorter time periods due to changes in tax laws.
† Estimated yearly.

IDENTITIES

(a) $p_{ns}C_{ns} + p_{nn}C_{nn} + p_aC_a + p_kI_p + p_kI_{pf} + p_kI_h + p_m\Delta I_i + p_f\Delta I_{if} + p_gG + p_eF_e - p_{if}F_{if} - p_{im}F_{im} - p_{ic}F_{ic} = pX$

(b) $C_{ns} + C_{nn} + C_a + I_p + I_{pf} + I_h + \Delta I_i + \Delta I_{if} + G + F_e - F_{if} - F_{im} - F_{ic} = X$

(c) $NI = pX - T_b - D_m - D_n - D_h - D_f - SD$

(d) $PI = NI - P_{cb} + D_c + T_r + I_{gc} - \text{SocSec}$

(e) $P_{cb} = NI - W_m - W_n - W_f - W_g - PB - FF - RI$

(f) $Y = (PI - T_p)/p_c$

(g) $X = X_m + X_n + X_h + X_f + X_g$

(h) $p_n = \dfrac{pX - p_mX_m - p_hX_h - p_fX_f - p_gX_g}{X_n}$

(i) $W_m = wr_m \cdot h_m \cdot N_m$

(j) $W_n = wr_n \cdot h_n \cdot N_n$

(k) $U_n = \dfrac{N_L^M - N_m - N_n - N_g^M - N_g^c - N_f - N_e}{N_L^M - N_g^M} \times 100$

(l) $p_c = \dfrac{p_{ns}C_{ns} + p_{nn}C_{nn} + p_aC_a}{C_{ns} + C_{nn} + C_a}$

(m) $I_p = I_{pm} + I_{pr} + I_{pc}$

(n) $\Delta I_i = \Delta I_{im} + \Delta I_{in}$

(o) $S_m = X_m - \Delta I_{im}$

(p) $S_n = X_n - \Delta I_{in}$

(q) $C_d = C_a + C_{na}$

(r) $P_{ca} = P_{cb} - T_c - IVA$

(s) $RE = P_{ca} - Dv$

(t) $p_kI_m = RE_m + D_m$

(u) $Cp = X_m/X_m^c$

(v) $K_a = \sum_{i=0}^{40} (0.929)^i C_{a-i}$

(w) $K_{na} = \sum_{i=0}^{40} (0.929)^i C_{na-i}$

(x) $K_m = \sum_{i=0}^{60} (0.953)^i I_{pm-i}$

(y) $K_n = \sum_{i=0}^{60} (0.953)^i (I_{pr} + I_{pc})_{-i}$

(z) $K_r = \sum_{i=0}^{N} \left(I_{nr} - \frac{D_r}{p_k} \right)_{-i}$

(aa) $K_c = \sum_{i=0}^{N} \left(I_{nc} - \frac{D_c}{p_k} \right)_{-i}$

(bb) $Z = X - \Delta I_i - \Delta I_{if} - G$

(cc) $C = C_{ns} + C_{nd} + C_a$

LIST OF VARIABLES

$^*A_i$	distributed lag weights (Almon weights) for investment functions. Normalized weights are $A_0 = 0.074$; $A_1 = 0.132$; $A_2 = 0.170$; $A_3 = 0.183$; $A_4 = 0.171$; $A_5 = 0.138$; $A_6 = 0.091$; $A_7 = 0.041$
$^*ANP_m$	first investment anticipations of manufacturing firms, billions of 1958 dollars
$^*ANP_n$	first investment anticipations of nonmanufacturing firms, billions of 1958 dollars
C	total consumption, billions of 1958 dollars
C_a	purchases of automobiles and parts, billions of 1958 dollars
C_d	purchases of consumer durables, billions of 1958 dollars
$^*C_d^e$	index of consumer anticipations, 1958 = 100 (Survey Research Center)
C_{nd}	purchases of consumer durables except automobiles and parts, billions of 1958 dollars
C_{ns}	purchases of consumer nondurables and services, billions of 1958 dollars
Cp	Wharton School index of capacity utilization
$^*Cr$	dummy variable for consumer credit terms: −1 when Regulation W was in effect; 0 otherwise before 1955; 1 in 1955.1 and later
$^*d_t$	dummy variable for change in depreciation tax laws: 0 before 1962; 1 in 1962.1 and later
$^*d_{KW}$	dummy variable for Korean War: 1 in 1950.3–1951.1; 0 elsewhere
$^*d_s$	dummy variable for supply shortages in automobiles: 3 in 1948.1–1948.2; 2 in 1948.3–1948.4; 1 in 1949.1 and 1952.3; 0 elsewhere
$^*d_{UW}$	dummy variable for unfilled orders: 1 in 1950.3 and 1951.1; −1 in 1953.3–1953.4; 0 elsewhere
D_c	depreciation for commercial and other investment, billions of current dollars
$^*D_f$	depreciation for farm investment, billions of current dollars
D_h	depreciation for residential construction, billions of current dollars
D_m	depreciation for manufacturing investment, billions of current dollars
D_r	depreciation for regulated and mining investment, billions of current dollars
D_v	dividends, billions of current dollars
F_e	exports, billions of 1958 dollars
$^*FF$	income of unincorporated businesses, farm sector, billions of current dollars
F_{nc}	imports of goods and services except food products, raw materials, and semi-manufactured goods, billions of 1958 dollars

F_{if}	imports of crude and manufactured food products, billions of 1958 dollars
F_{im}	imports of nonfood crude materials and semimanufactured goods, billions of 1958 dollars
$^*FR$	net free reserves as a percentage of total required reserves
$^*G$	government purchases of goods and services, billions of 1958 dollars
$^*G_d$	government purchases for national defense, billions of 1958 dollars
h_m	index of hours worked in the manufacturing sector, 40 hours = 1.00
h_n	index of hours worked in the nonmanufacturing sector, 40 hours = 1.00
$^*i_d$	discount rate, percent
$^*I_{cc}$	interest paid by government and consumers, billions of current dollars
I_h	investment in nonfarm residential construction, billions of 1958 dollars
$^*I_h^s$	private nonfarm housing starts, thousands
I_i	stock of nonfarm inventories, billions of 1958 dollars, arbitrary origin
$^*I_{if}$	stock of farm inventories, billions of 1958 dollars, arbitrary origin
I_{im}	stock of manufacturing inventories, billions of 1958 dollars, arbitrary origin
I_{in}	stock of nonmanufacturing nonfarm inventories, billions of 1958 dollars, arbitrary origin
i_L	Moody's average yield on bonds, percent
I_p	nonfarm investment in plant and equipment, billions of 1958 dollars
I_{pc}	plant and equipment investment in commercial and other industries, billions of 1958 dollars
$^*I_{pf}$	farm investment in plant and equipment, billions of 1958 dollars
I_{pm}	manufacturing investment in plant and equipment, billions of 1958 dollars
I_{pr}	regulated and mining investment in plant and equipment, billions of 1958 dollars
i_s	short-term interest rate on four- to six-month commercial paper, percent
IVA	inventory valuation adjustment, billions of 1958 dollars
K_a	stock of automobiles, billions of 1958 dollars
K_c	stock of commercial and other investment, billions of 1958 dollars, arbitrary origin
K_m	stock of manufacturing investment, billions of 1958 dollars
K_{nd}	stock of consumer durables except automobiles, billions of 1958 dollars
K_n	stock of nonmanufacturing nonfarm private investment, billions of 1958 dollars
K_r	stock of regulated and mining investment, billions of 1958 dollars, arbitrary origin
L_m	cash flow in the manufacturing sector, billions of 1958 dollars
$^*N$	total population, millions
$^*N_e$	self-employed except agriculture, millions
$^*N_f$	number of farm workers, millions
$^*N_g^c$	number of civilian government employees, millions

$*N_g^M$	number of military personnel, millions
NI	national income, billions of current dollars
N_L^M	total labor force including armed forces
N_m	manufacturing employees, millions
N_m^L	manufacturing labor force, millions
N_n	nonmanufacturing nonfarm private employees, millions
p	implicit GNP deflator, 1958 = 1.00
p_a	implicit deflator for automobiles, 1958 = 1.00
PB	nonfarm unincorporated business income, billions of current dollars
p_c	implicit consumption deflator, 1958 = 1.00
P_{ca}	corporate profits after taxes, billions of current dollars
P_{cb}	corporate profits before taxes adjusted for IVA, billions of current dollars
p_e	implicit deflator for exports, 1958 = 1.00
$*p_f$	prices received by farmers, 1958 = 1.00
$*p_g$	implicit deflator for government purchases, 1958 = 1.00
p_h	implicit deflator for nonfarm residential construction, 1958 = 1.00
PI	personal income, billions of current dollars
$*p_{im}$	implicit deflator for nonfood material imports, 1958 = 1.00
p_k	implicit deflator for nonresidential fixed business investment, 1958 = 1.00
p_m	implicit deflator for gross output originating in the manufacturing sector, 1958 = 1.00 (identical with wholesale price level excluding food and farm products)
p_n	implicit deflator for gross output originating in the nonmanufacturing nonfarm private sector, 1958 = 1.00
p_{nd}	implicit deflator for consumer durables except automobiles, 1958 = 1.00
p_{ns}	implicit deflator for consumer purchases of nondurables and services, 1958 = 1.00
$*p_r$	price index of rent, 1958 = 1.00
*prod	productivity trend: increases at 2.8 percent per year through 1959 and 3.6 percent per year 1960 to 1964
$*p_{wt}$	price of world trade, 1958 = 1.00
RE	retained earnings, billions of current dollars
RE_m	retained earnings of manufacturing corporations, billions of current dollars
RI	rent and net interest paid, billions of current dollars
$*SCI$	social security contributions of individuals, billions of current dollars
$*SD$	statistical discrepancy plus subsidies less current surpluses of government enterprises, billions of current dollars
S_m	sales originating in the manufacturing sector, billions of 1958 dollars

S_n	sales originating in the nonmanufacturing nonfarm private sector, billions of 1958 dollars
*SocSec	social security contributions of employers, employees, and self-employed, billions of current dollars
*STR	dummy variable for steel strike: +1 in 1952.2, 1959.2, and 1960.1; −1 in 1952.3; −2 in 1959.3; 0 elsewhere
*t	time trend, 1948.1 = 1
T_b	indirect business taxes and business transfers, billions of current dollars
T_c	corporate income taxes, billions of current dollars
T_p	personal tax and nontax payments, billions of current dollars
Tr	transfer payments, billions of current dollars
U	unfilled orders, billions of 1958 dollars
U^*	unemployment rate of males age 25 to 34, percent
Un	unemployment rate, percent
*W_f	wage bill for farm workers, billions of current dollars
*W_g	wage bill of government employees, billions of current dollars
W_m	wage bill of manufacturing employees, billions of current dollars
W_n	wage bill of nonmanufacturing nonfarm private employees, billions of current dollars
wr_m	wage rate of manufacturing employees, thousands of dollars per year
wr_n	wage rate of nonmanufacturing employees, thousands of dollars per year
X	gross national product, billions of 1958 dollars
*X_f	gross output originating in the farm sector, billions of 1958 dollars
*X_g	gross output originating in the government sector, billions of 1958 dollars
*X_h	gross output originating from rent, billions of 1958 dollars
X_m	gross output originating in the manufacturing sector, billions of 1958 dollars
X_m^c	maximum gross output originating in the manufacturing sector, billions of 1958 dollars
X_n	gross output originating in the nonmanufacturing nonfarm nonrent private sector, billions of 1958 dollars
*X_{wt}	index of world trade, 1958 = 100.0
Y	personal disposable income, billions of 1958 dollars
Z	final sales in the private sector, billions of 1958 dollars

* Denotes an exogenous variable.

APPENDIX D

Candide's Model Structure

Supersectors of CANDIDE Model 1.1

I Final Demand by Ultimate Use
- Includes: Sectors A, B, C, D, E, F, G, H, and I
- Contains: 223 behavioural equations and 617 identities
- Principal outputs:
  - Personal savings and aggregate consumption
  - Disaggregated consumption
  - Residential construction
  - Business fixed capital formation
  - Inventory investment
  - Government expenditures on goods and services
  - Export flows
  - Import flows

II Derivation of Real Domestic Product by Industry
- Includes: Sector J
- Contains: 63 behavioural equations, 188 I/O relationships, and 16 other identities
- Principal outputs:
  - First estimates, on the basis of the Input-Output submodel, of RDP for 75 I/O industries
  - Model estimates, on the basis of autoregressive adjustment equations, of RDP for 63 National Account industries

III Labour Supply and Requirements
- Includes: Sectors K and L
- Contains: 28 behavioural equations and 26 identities
- Principal outputs:
  - Labour force, by age-sex groups
  - Labour demand by 12 major industries
  - Unemployment rate

IV Wages and Prices
- Includes: Sectors M, N, O, P, Q, and R
- Contains: 249 behavioural equations, 239 I/O relationships, and 183 other identities
- Principal outputs:
  - Wage rates and labour incomes by major industries
  - Industry prices (deflators of Gross Domestic Product, by industry)
  - Prices of competing import commodities
  - Other endogenous foreign trade prices
  - First estimates, on the basis of the I/O prices submodel, of the final demand deflators of domestic expenditure categories
  - Final estimates, on the basis of autoregressive adjustment equations, of the implicit deflators of domestic expenditure categories
  - Some aggregative price level variables

V Private and Government Revenues
- Includes: Sectors S and T
- Contains: 32 behavioural equations and 54 identities
- Principal outputs:
  - Disposable income
  - Corporate profits
  - Government transfer payments to persons
  - Tax and nontax revenues of governments

VI National Income Accounting Relationships
- Includes: Sector X
- Contains: 1 behavioural equation and 36 identities
- Principal outputs:
  - Gross National Expenditure in current and constant dollars
  - Major components of Gross National Expenditure, in current dollars
  - Savings and investment aggregates, including government budget balance

VII Financial Flows
- Includes: Sectors U and V
- Contains: 15 behavioural equations and 9 identities
- Principal outputs:
  - Short-term and long-term Canadian interest rates
  - Capital flow items in the Canadian balance of payments

VIII Interior Sectors
- Includes: Sectors W and Y
- Contains: 5 behavioural equations and 65 identities
- Principal outputs:
  - Net immigration
  - Canadian population, total and by age-sex groups
  - U.S. industrial production index
  - OECD (excluding Canada) industrial production index

List of Sectors, CANDIDE Model 1.1

(April version)

Alphabetic symbol of sector	Shortened name of sector	Number of equations in sector	Computer blocks from which equations are drawn
A	Personal savings and aggregate consumption	9 (2,B; 7,I)	1
B	Consumption categories	116 (40,B; 76,I)	2, 37, 41 (Equation 1), 19 (Equations 47-49)
C	Residential construction	24 (11,B; 13,I)	3
D	Business fixed capital formation	268 (74,B; 194,I)	4, 32, 44, 45
E	Inventory investment	38 (8,B; 30,I)	5, 38 (Equations 39 to end)
F	Government expenditures on goods and services	77 (22,B; 55,I)	6, 38 (up to Equation 38)
G	Export flows	164 (34,B; 130,I)	7 (part), 16 (part), 18, 39 (part), 42 (part)
H	Import flows	92 (20,B; 72,I)	8, 17 (part), 43 (part)
I	Trade flows in automobiles (detail)	52 (12,B; 40,I)	41 (except first 3 equations) 46 (except final equation)
J	Derivation of Real Domestic Product, by industry	267 (63,B; 188,I/O; 16, other I)	9, 10, 23, 25
K	Labour supply	15 (4,B; 11,I)	11 (to Equation 22)
L	Labour requirements	39 (24,B; 15,I)	11 (Equation 22 to end), 12
M	Wage rates and labour income	39 (21,B; 18,I)	13, 14 (first 12 equations)
N	Industry prices (GDP of value-added deflators)	79 (35,B; 44,I)	14 (Equation 13 to end)
O	Export prices	20 (all I)	16 (part), 42 (part)
P	Deflators of import trade flows	40 (all I)	17 (part), 43 (part)
Q	Prices of competing import commodities	80 (46,B; 34,I)	40
R	Derivation of final demand deflators	413 (147,B; 239,I/O; 27 other I)	26, 27, 28, 29, 30, 31, 15, 17 (Equation 40), 24 (Equations 24, 25, 27, and 28), 33, 34, 35, 36 (first 4 equations)
S	Private nonlabour and total incomes	46 (21,B; 25,I)	19 (part)
T	Government revenues	40 (11,B; 29,I)	19 (part)
U	Money and interest rates	10 (9,B; 1,I)	20
V	Financial flows, balance of payments	14 (6,B; 8,I)	21
W	Demography	58 (1,B; 57,I)	22
X	National income accounting relationships, including savings and government budget balance measures	37 (1,B; 36,I)	24 (part), 36 (part)
Y	Linkages with U.S. and other foreign economies	12 (4,B; 8,I)	7 (part), 39 (part), 46 (Equation 27)
Total number of equations		2,049 (comprised of: 616,B; 427,I/O; 1,006, other I)	

B -- behavioural equations
I -- identities
I/O -- input-output relationships

Classes of Formal Exogenous Variables in CANDIDE Model 1.1

Class	Description	Number of variables
I	Dummies (including time trends)	51
II	Foreign trade variables	
	1 Exports -- flows and adjustment items	27
	2 Foreign trade prices	58
	3 Imports -- fuel flows and adjustment items	11
III	International financial transactions (including the exchange rate)	8
IV	Capital stock characteristics (scrappage levels)	84
V	Policy variables (instruments)	
	1 Government expenditures on transfers and goods and services	32
	2 Monetary variables	2
	3 Tax rates and government revenues	62
VI	Demographic variables (underlying magnitudes)	46
VII	Real income variables and overseas economies	3
VIII	U.S. economy	
	1 Wharton Model variables	21
	2 Others	2
IX	Miscellaneous exogenous variables	
	1 Adjusting items	28
	2 Others (excluding REZ)	18
	Total	453

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