Analysis of Structure of Production and Institutional Income Distribution since1970 : The Case of Iran.

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Abstract

The concept of institutional distribution of income in the framework of SAM for development policy purposes was introduced by Prof. Pyatt in the Iranian economy. The SAMs which he had constructed for the year 1970 and 1972 were simplified SAMs in which out of three conventional endogenous accounts (production, factor and institution) two endogenous accounts have been considered. The subsequent two SAMs of 1996 and 2000 give three conventional endogenous accounts. Using structural path analysis (SPA) we maintain that SAMs of 1996 and 2000 as compared to SAMs of 1970 and 1972 have more flexibility to unravel the socio economic aspects of the Iranian economy with respect to structure of production and institutional income distribution for policy purposes.

Introduction

After the quadrupling of oil revenues in Iran, the issue of the growth equity trade off for analyzing the dual characteristic of the Iranian economy has been the main concern of researchers and policy makers (Banouei, 1992a, Banouei, 1992b, Prasad, Banouei and Swaminathan, 1992). On the one hand, using partial approaches in the framework of the Kuznet's hypothesis, the economists of the then Plan and Budget organization,

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found that in the short run there was no remedy for urban rural income inequalities, but in the long run it is expected that the policies of growth-oriented development of resource-based industries would bridge urban-rural income inequalities (Vakil,1975). On the other hand, many analysts while dealing with the socio-economic pects as of the Iranian economy have not justified these line of analysis and susequently found that the policies of growth-oriented resource-based policies had in fact exacerbated urban-rural income inequalities in Iran (Nili and Farahbash,1998, Bulmer-Thomas and Zamani,1989).

After the revolution the social aspects of growth equality trade off has been the main focus of policy makers. The results however were not upto expectations. As in the nineties , it is observed that overall policies as well as the impact of economic liberalization could almost bring about an expected growth rate for the economy ,but they did not accomplish a favourable increase in employment nor bridge the gap between urban-rural income inequalities (Management and Planning Organization, 2003)[1]

These observations are similar to the following statement made by Prof.Pyatt around three decades ago « in this particular case the results turned out to be rather interesting. They suggested that the way in which Iran was aspending its oil revenues was likely to exacerbate urban-rural income differentials » (Pyatt,2001p.60. Very recently some analysts have attempted to investigate the implications of the sectoral performance of the Iranian economy using the conventional multiplier approach which was not specified by Pyatt (Banouei & Asgari,2003). They reached the conclusion that the overall policies of sectoral expansion will tend to increase sectoral urban-rural income inequalities and as compared to the other sectors of the economy the policy expansion of agriculture, agro-based industries and construction have a greater tendency to reduce urban-rural labour incomes as well as urban-rural household incomes. Based on global (direct and indirect effects) of one exogenous account on another

endogenous account, these observations cannot reveal the socio-economic aspects of the complexities of the production processes for analysts and policy makers. This issue has further been investigated by Banouei and Banouei in the framework of Structural Path Analysis (SPA) (Banouei and Banouei, 2004). They found that the development of agriculture and agro-based industries are more likely to bridge income inequalities and also bring about structural changes from a public oriented economy to a private oriented economy.

All the above investigations and subsequent observations, are based on the static approach using one year Social Accounting Matrix.

The main concern of this paper is to apply comparative static approach using four social accounting matrices for the years 1970, 1972, 1996 and 2000. For this purpose, the contents of this paper are organized as follows: In Section 1, we briefly present the methodology of the paper. Data base and data adjustments are covered in Section 2. The empirical results and analysis are given in Section 3. In the last section, we end with the Summary and Conclusions.

۱- The Methodology of the Paper

The appropriate way to understand the basic structure of a SAM is to organize all accounts into endogenous and exogenous accounts in a matrix framework.

Tables 1 and 2 show the resulting simplified structure of four Iranian SAMs.

The main difference between Table 1 and Table 2 is that in Table 1, which shows the simplified structure of 1970 and 1972 SAMs, the factor account has not been considered and therefore, it is assumed that value added is paid directly to institutions rather than being routed via a distinct set of factor accounts (Pyatt, 2001). Therefore, as compared to the 1996 and 2000 Iranian SAMs which consist of three conventional endogenous

Table 1– Simplified SAMs of 1970 and 1972 in terms of Endogenous and Exogenous Accounts.

Receipts → Expenditures ↓		Endogenous Accounts		Exogenous Accounts	Totals
		1-Production Activities	2- Institutions i.e. Households	Sum of other Accounts	
Endogenous Accounts	1-Production Activities	N_{11}	N_{12}	x_1	y_1
	2-Institutions i.e. Households	N_{21}	N_{22}	x_2	y_2
Exogenous Accounts	Sum of other Accounts	l_1'	l_2'	R	y_x
Totals		y_1'	y_2'	y_x'	

Table2– Simplified SAMs for 1996 and 2000 in terms of Endogenous and Exogenous Accounts.

Receipts → Expenditures ↓		Endogenous Accounts			Exogenous Accounts	Totals
		1-Production Activities	2- Factors of Production	3- Institutions i.e. Households and Companies	Sum of other Accounts	
Endogenous Accounts	1-Production Activities	N_{11}	O	N_{13}	x_1	y_1
	2- Factors of production	N_{21}	O	O	x_2	y_2
	3- Institutions i.e. Households	O	N_{32}	N_{33}	x_3	y_3
Exogenous Accounts	Sum of other Accounts	l_1'	l_2'	l_3'	R	y_x
Totals		y_1'	y_2'	y_3'	y_x'	

Table3:The Global Influences of a Unit Increase of Exogenous variables of seven sectors on Urban – Rural Incomes in 1970, 1972, 1996and 2000

Sectors	1970			1972			1996			2000		
	Uh Income 1	Rh Income 2	Total Household Income ١+2=3	Uh Income 1	Rh Income 2	Total Household Income ١+2=3	Uh Income 1	Rh Income 2	Total Household Income ١+2=3	Uh Income 1	Rh Income 2	Total Household Income ١+2=3
Ag	١.59	١.26	2.85	١.31	١.03	2.34	١.28	0.59	١.87	١.08	0.53	١.61
min	١.26	0.33	١.59	١.06	0.21	١.27	0.53	0.17	0.70	0.51	0.18	0.69
Agbo	١.60	0.65	2.25	١.33	0.43	١.76	١.12	0.48	١.60	0.61	0.27	0.88
Oi	0.95	0.25	١.20	0.77	0.15	0.92	0.63	0.24	0.87	0.56	0.23	0.79
Weg	١.72	0.48	2.20	١.44	0.32	١.76	0.74	0.25	0.99	0.76	0.28	١.04
Con	١.42	0.44	١.86	١.15	0.29	١.44	0.98	0.43	١.41	0.79	0.36	١.15
Ser	١.86	0.60	2.46	١.54	0.42	١.96	١.08	0.42	١.50	0.93	0.36	١.29

Source: Banouei (2005)

Agriculture (Ag), Mining (Min), Agrobased industries (Agbi), other industries (oi), Water, electricity and gas (Weg), Construction (Con), Services (Ser), Total Urban Labour income Urban households (Uh), Rural households (Rho)

Table 4–SPA: Global Influences Direct Influencess and Total Influences for Selected paths in 1970							
(1) Path origin (i)→	(2) Path Destination (j)	(3) Global Influence $I^G I \rightarrow j) = Ma_{ji}$	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j) \times$	(6) Path Multiplier M=	(7) Total Influence I^T (i→j) p	$\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (Percent)
Ag (A1)	Uh	١.594	Ag→Uh Ag → Ser →Uh Ag →Rh→Agro →Uh Ag → Rh → ser→ Uh Ag → Rh → Agro →Ser→ Uh	0.196 0.082 0.041 0.036 0.020	3.358 3.891 4.085 3.961 4.643	0.658 0.321 0.167 0.141 0.092	41.3 20.1 10.1 8.8 5.7
Ag (A2)	Rh	١.256	Ag→Rh	0.508	2.330	١.183	94.1
Min (A3)	Uh	١.257	Min→Uh Min →Ser →Uh	0.40 0.013	2.916 3.431	١.166 0.046	92.8 3.7
Min (A4)	Rh	0.335	Min→Rh Min →Uh → Ag →Rh Min →Uh→Agro →Rh Min → Uh → ser→ Rh Min → Uh → Agro → Ag → Rh	0.010 0.036 0.003 0.006 0.008	2.632 4.835 4.975 4.794 5.666	0.027 0.172 0.013 0.029 0.043	8.2 51.5 3.8 8.7 12.9
Agro (A5)	Uh	١.605	Agro→Uh Agro → Ag →Uh Agro → Min →Uh Agro → ser→ Uh Agro → Ag → Ser→ Uh	0.274 0.034 0.024 0.132 0.014	2.671 4.011 3.710 3.105 4.611	0.733 0.135 0.088 0.410 0.065	45.7 8.4 5.5 25.6 4.1

Table 4 Count…							
(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i→j)$= Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i→j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i→j)P$	(8) $\frac{I^T(i→j)}{I^G(i→j)}$ (percent)
Agro (A6)	Rh	0.653	Agro→ Rh Agro →Ag→ Rh Agro →Ser→Rh Agro →Uh→Ag → Rh Agro → Ser →Uh →Ag→ Rh	0.029 0.087 0.017 0.024 0.012	2.637 3.249 3.665 4.085 4.643	0.076 0.283 0.064 0.100 0.055	11.7 43.4 9.7 15.3 8.4
Oi (A7)	Uh	0.952	Oi→Uh Oi→Min→Uh Oi→ Ser →Uh	0.330 0.018 0.064	2.110 2.934 2.486	0.696 0.052 0.160	73.1 5.4 16.8
Oi (A8)	Rh	0.251	Oi→ Ser→ Rh Oi→ Uh →Ag → Rh Oi→ Ser →Uh →Ag→ Rh Oi →Uh → Agro → Ag→ Rh	0.008 0.029 0.006 0.006	2.874 3.504 3.985 4.109	0.024 0.103 0.023 0.026	9.7 41.1 9.1 10.3
Weg (A9)	Uh	١.721	Weg→Uh Weg→Min→Uh	0.668 0.098	2.01 2.472	١.405 0.242	81.6 14.1
Weg (A10)	Rh	0.480	Weg→Rh Weg → Ser→ Rh Weg →Uh→ Ag → Rh Weg → Uh → Ser → Rh Weg → Ser →Uh →Ag→ Rh Weg →Uh → Agro → Ag→ Rh	0.026 0.013 0.060 0.010 0.009 0.013	١.854 2.822 3.489 3.457 3.961 4.092	0.049 0.036 0.208 0.035 0.035 0.052	10.2 17.7 43.3 7.3 7.2 10.9

Table 4 Count…

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \to j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \to j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \to j)P$	(8) $\frac{I^T(i \to j)}{I^G(i \to j)}$ (percent)
Con (A11)	Uh	1.415	Con → Uh Con → Agro → Uh Con →Oi→ Uh Con →Ser→Uh	0.344 0.019 0.026 0.153	2.06 2.671 2.11 2.471	0.721 0.052 0.056 0.378	51 3.7 3.9 26.7
Con (A12)	Rh	0.444	Con→Rh Con → Ser→ Rh Con → Agro → Ag→ Rh Con →Uh→ Ag → Rh Con → Uh → Ser → Rh Con → Ser →Uh →Ag→ Rh Con →Uh → Agro → Ag→ Rh	0.029 0.020 0.006 0.031 0.005 0.014 0.007	١.791 2.771 3.249 3.842 3.457 3.961 4.085	0.051 0.056 0.020 0.107 0.018 0.054 0.027	11.5 12.6 4.5 24.1 4.1 12.2 6.1
Ser (A13)	Uh	١.856	Ser→Uh	0.689	2.471	١.702	91.7
Ser (A14)	Rh	0.604	Ser→Rh Ser →Uh→ Ag → Ag → Rh Ser →Uh → Agro → Ag→ Rh	0.091 0.061 0.013	2.771 3.961 4.643	0.251 0.243 0.061	41.5 40.2 10.1

Table 5 – SPA: Global Influences, Direct influnces and Total Influences for Selected paths in 1972

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Ag (B1)	Uh	1.313	Ag → Uh	0.196	2.580	0.505	38.5
			Ag → Ser → Uh	0.102	2.945	0.301	22.9
			Ag →Rh→ Agro → Uh	0.040	3.180	0.129	9.8
			Ag→Rh →Ser→Uh	0.036	3.004	0.108	8.2
			Ag→Rh→ Agro →Ser→Uh	0.022	3.562	0.077	5.9
Ag (B2)	Rh	۱.034	Ag → Rh	0.509	۱.912	0.973	94.1
			Ag → Ser → Rh	0.013	2.622	0.034	3.2
Min (B3)	Uh	۱.057	Min → Uh	0.040	2.470	0.989	93.5
			Min → Ser → Uh	0.012	2.862	0.033	3.1
Min (B4)	Rh	0.212	Min → Rh	0.009	2.331	0.020	9.7
			Min → Uh→ Ag → Rh	0.030	3.747	0.112	52.7
			Min → Uh → Ser → Rh	0.005	3.853	0.019	9.1
			Min → Uh → Agro → Ag → Rh	0.004	4.442	0.018	8.5
Agro (B5)	Uh	1.326	Agro → Uh	0.276	2.224	0.613	46.2
			Agro → Ag → Uh	0.021	3.119	0.067	5
			Agro → Min → Uh	0.024	3.109	0.056	5.7
			Agro →Weg→Uh	0.025	2.230	0.377	4.2
			Agro →Ser→Uh	0.148	2.546		28.4
Agro (B6)	Rh	0.428	Agro → Rh	0.029	2.270	0.066	15.3
			Agro → Ag → Rh	0.056	2.625	0.146	34.1
			Agro → Ser → Rh	0.019	3.001	0.056	13.1
			Agro → Uh → Ag → Rh	0.021	3.18	0.065	15.2
			Agro → Ser → Uh → Ag → Rh	0.011	3.562	0.039	9.2

Table 5: Cont . . .

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)$P	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Oi (B7)	Uh	0.77	Oi → Uh Oi → Min → Uh Oi → Ser → Uh	0.33 0.014 0.057	١.775 2.484 2.058	0.586 0.034 0.118	76.2 4.4 15.3
Oi (B8)	Rh	0.152	Oi → Rh Oi → Uh→ Ag → Rh Oi → Uh → Ser → Rh Oi → Ser → Uh → Ag → Rh Oi → Uh → Agro → Ag → Rh	0.007 0.025 0.004 0.004 0.003	2.365 2.695 2.773 3.019 3.197	0.017 0.066 0.011 0.013 0.011	11.3 43.7 7.6 8.5 7
Weg (B9)	Uh	١.440	Weg → Uh Weg → Ser → Uh	0.660 0.104	١.770 2.408	١.168 0.214	81.1 14.9
Weg (B10)	Rh	0.316	Weg → Rh Weg → Ser → Rh Weg → Uh→ Ag → Rh Weg → Uh → Ser → Rh Weg → Ser → Uh → Ag → Rh Weg → Uh → Agro → Ag → Rh	0.027 0.013 0.049 0.008 0.008 0.007	١.651 2.335 2.686 2.758 3.004 3.188	0.044 0.031 0.132 0.023 0.023 0.021	13.9 9.8 41.7 7.2 7.4 6.7
Con (B11)	Uh	١.512	Con → Uh Con → Agro → Uh Con → Oi → Uh Con →Ser→Uh	0.344 0.019 0.03 0.14	١.764 2.224 ١.775 2.047	0.607 0.041 0.053 0.288	52.7 3.6 4.6 25
Con (B12)	Rh	0.292	Con → Rh Con→ Uh→ Ag → Rh Con → Ser → Uh → Ag → Rh	0.029 0.026 0.01	١.599 2.680 3.004	0.046 0.069 0.031	15.8 23.6 10.8

Table 5: Cont . . .

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)$P	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Ser (B13)	Uh	١.543	Ser → Uh	0.694	2.047	١.425	92.4
Ser (B14)	Rh	0.416	Ser → Rh Ser → Uh → Ag → Rh Ser → Uh → Agro → Ag → Rh	0.088 0.052 0.007	2.296 3.004 3.562	0.202 0.156 0.025	48.7 37.5 6

Table 6 – SPA: Global Influences, Direct influences and Total Influences for Selected paths in 196							
(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$= Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j)\times$	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Ag (C1)	Uh	1.283	Ag→Uplab → Uh Ag → Mi → Uh Ag→ Ser→ Mi →Uh	0.023 0.316 0.025	2.445 2.590 3.041	0.056 0.819 0.075	4.4 63.8 5.8
Ag (C2)	Rh	0.594	Ag→Rplab → Rh Ag → Mi → Rh Ag→ Ser→ Mi →Rh	0.049 0.156 0.012	١.٨٩١ 2.251 2.975	0.092 0.351 0.036	15.6 59.1 6.1
Min (C3)	Uh	0.534	Min→Upulab → Uh Min → Mi → Uh Min → OS → Uh Min → OS→Com → Uh	0.028 0.033 0.043 0.113	١.٩٤٧ 2.209 ١.٩٦٥ 2.193	0.055 0.074 0.084 0.248	10.3 13.8 15.7 46.5
Min (C4)	Rh	0.168	Min→Rpulab → Rh Min → Mi → Rh Min → OS → Rh	0.007 0.016 0.017	١.٣٩١ ١.٩١٢ ١.٥٢١	0.010 0.032 0.026	5.9 18.8 15.5
Agro (C5)	Uh	1.124	Agro →Rpla → Uh Agro → Mi → Uh Agro→ Ag → Mi → Uh Agro→ Ser →Upulab → Uh Agro→ Ser → Mi → Uh	0.0[illegible] 0.068 0.104 0.023 0.034	2.577 2.795 3.196 3.151 3.268	0.066 0.191 0.332 0.071 0.112	5.9 17 29.5 6.4 10
Agro (C6)	Rh	0.483	Agro Rplab → Rh Agro → Mi → Rh Agro →Ag →Rpla → Rh Agro → Ag → Mi → Rh Agro → Ser → Mi → Rh	0.012 0.034 0.016 0.015 0.017	2.027 2.482 2.499 2.842 3.240	0.023 0.084 0.04 0.146 0.055	4.8 17.3 8.4 30.1 11.4

Table 6: Cont . . .

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths $I^D(i \rightarrow j)$	(5) Direct Influence $I^D(i \rightarrow j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)$P	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Oi (C7)	Uh	0.625	Oi →Uplab → Uh	0.027	2.614	0.07	11.3
			Oi → Upulab → Uh	0.024	2.614	0.062	9.8
			Oi → Mi →Uh	0.036	2.940	0.105	16.8
			Oi→ Ser → Upulab → Uh	0.016	3.219	0.015	8.1
			Oi→ Ser → Mi → Uh	0.024	3.431	0.082	13
			Oi → OS→Com → Uh	0.022	2.941	0.063	10.1
Oi (C8)	Rh	0.236	Oi →Rpulab → Rh	0.010	١.941	0.020	8.4
			Oi → Mi → Rh	0.018	2.593	0.046	19.4
			Oi →Rplab → Rh	0.008	١.941	0.015	6.3
			Oi → Ser →Rpulab → Rh	0.004	3.071	0.013	5.7
			Oi→ Ser → Mi → Rh	0.012	3.404	0.04	17
Weg (C9)	Uh	0.738	Weg → Upulab → Uh	0.072	2.188	0.157	21.3
			Weg → Mi →Uh	0.032	2.480	0.018	11
			Weg → OS→ Uh	0.028	2.208	0.061	8.3
			Weg → Ser → Upulab → Uh	0.015	2.734	0.041	5.5
			Weg → Ser → Mi → Uh	0.022	2.925	0.066	8.9
			Weg → OS→Com → Uh	0.074	2.464	0.181	24.6
Weg (C10)	Rh	0.249	Weg →Rpulab → Rh	0.014	١.572	0.022	8.8
			Weg → Mi → Rh	0.016	2.154	0.035	14
			Weg → OS → Rh	0.011	١.715	0.019	7.6
			Weg → Ser →Rpulab → Rh	0.004	2.582	0.011	4.2
			Weg → Ser → Mi → Rh	0.011	2.882	0.032	12.8

Table 6: Cont . . .

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j)$ ×	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Con (C11)	Uh	0.978	Con→Uplab → Uh Con → Mi →Uh Con → Ser → Upulab → Uh Con → Ser → Mi → Uh	0.093 0.105 0.020 0.030	١.982 2.246 2.467 2.639	0.184 0.237 0.048 0.078	18.8 24.2 4.9 8
Con (C12)	Rh	0.425	Con → Uplab → Rh Con → Ser → Rh Con → Ser → Mi → Rh	0.070 0.052 0.015	١.420 ١.944 2.594	0.099 0.101 0.038	23.4 23.8 8.9
Ser (C13)	Uh	١.076	Ser → Uplab → Uh Ser → Upulab →Uh Ser → Mi → Uh Ser → OS→Com → Uh	0.027 0.122 0.185 0.037	2.434 2.434 2.604 2.724	0.065 0.297 0.481 0.102	6.1 27.6 44.7 9.5
Ser (C14)	Rh	0.415	Ser →Rplab → Rh Ser → Rpulab → Rh Ser → Mi → Rh	0.006 0.034 0.091	2.290 2.290 2.559	0.014 0.077 0.233	3.4 18.5 56

Table 7: Cont . . .

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$=Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j) \times p$	(6) path multi plier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Ag (D1)	Uh	١.076	Ag →Uplab → Uh Ag → Mi →Uh Ag → Ser → Mi → Uh	0.019 0.373 0.014	2.037 2.114 2.539	0.039 0.789 0.037	3.6 73.3 3.4
Ag (D2)	Rh	0.532	Ag →Rplab → Rh Ag → Mi → Rh Ag → Ser → Mi → Rh	0.049 0.184 0.007	١.645 ١.850 2.477	0.081 0.340 0.018	15.2 63.8 3.3
Min (D3)	Uh	0.509	Min → Upulab → Uh Min → OS→ Uh Min → OS→Com → Uh	0.014 0.189 0.070	١.627 ١.648 ١.805	0.023 0.311 0.126	4.5 61.2 24.7
Min (D4)	Rh	0.180	Min → OS → Rh Min →MI→Com → Rh Min → Mi→Uho→ Ag →Weg → Rh Min → Mi→Uho→ Ser →Oi → Rh Min → Mi→Uho→ Ser → Weg → Rh	0.073 0.006 0.004 0.003 0.006	١.326 ١.463 2.201 2.151 2.151	0.097 0.009 0.010 0.006 0.013	54.2 4.9 5.4 3.1 7.1

Table 7: cont…

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$= Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j) \times p$	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Agro (D5)	Uh	0.613	Agbi→Uplab→Uh Agbi→ Upulab →Uh Agbi→ Mi→Uh Agbi→ Os →Uh Agbi→Ag → Mi Agbi→Ser→Upulab→Uh Agbi→Ser → Upulab →Uh Agbi→Ser →Mi →Uh	0.026 0.013 0.039 0.023 0.065 0.07 0.020	١.921 ١.921 2.044 ١.946 2.472 2.380 2.450	0.050 0.025 0.080 0.044 0.760 0.040 0.049	8.2 4.1 13.1 7.2 26.2 6.5 8
Agbro (D6)	Rh	0.271	Agbi→Rplab→Rh Agbi→Mi→Rh Agbi→ Os →Rh Agbi→Ag →Rplab→Rh Agbi→Ag→Mi→Rh Agbi→Ser→ Rpulab →Rh Agbi→Ser→Mi→Rh	0.014 0.019 0.009 0.009 0.032 0.004 0.010	١.494 ١.805 ١.602 ١.976 2.191 2.255 2.408	0.022 0.035 0.014 0.017 0.070 0.010 0.024	8 12.9 5.2 6.2 25.8 3.6 8.7
Oi (D7)	Uh	0.561	Oi→Uplab→Uh Oi→Upulab→Uh Oi→Mi→Uh Oi→Os→Uh Oi→Ser→Upulab→Uh Oi→Ser→Mi→Uh Oi→Ser →Os→Uh Oi →Os→Com→Uh	0.025 0.028 0.048 0.028 0.022 0.026 0.007 0.010	2.114 2.114 2.265 2.143 2.600 2.693 2.612 2.36	0.052 0.060 0.110 0.060 0.057 0.070 0.018 0.024	9.3 10.7 19.6 10.7 10.1 12.5 3.1 4.3

Table 7: Cont…..

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i\rightarrow j)$= maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i\rightarrow j)\times p$	(6) path multiplier M=	(7) Total Influence $I^T(i\rightarrow j)P$	(8) $\frac{I^T(i\rightarrow j)}{I^G(i\rightarrow j)}$ (percent)
Oi (D8)	Rh	0.227	Oi→Rplab→Rh	0.012	١.634	0.020	8.7
			Oi→ Rpulab→Rh	0.009	١.634	0.015	6.4
			Oi→Mi→Rh	0.024	2.003	0.048	21
			Oi→ Os →Rh	0.011	١.755	0.019	8.4
			Oi→Ser→Rpulab→Rh	0.006	2.449	0.014	6.1
			Oi→Ser→Mi→Rh	0.013	2.647	0.034	14.9
Weg (D9)	Uh	0.756	Weg→Upulab→Uh	0.103	١.694	0.174	22.8
			Weg→Mi→Uh	0.013	١.824	0.023	3
			Weg→Os→Uh	0.061	١.719	0.105	13.8
			Weg→Min→Os→Uh	0.026	١.730	0.045	5.9
			Weg→Ser→Upulab→Uh	0.033	2.119	0.069	9
			Weg→Ser→Mi→Uh	0.039	2.193	0.085	11.1
			Weg→Os→Com→Uh	0.023	١.883	0.043	5.6
Weg (D10)	Rh	0.277	Weg→Rpulab→Rh	0.019	١.296	0.025	9
			Weg→Mi→Rh	0.006	١.609	0.010	3.6
			Weg→Os→Rh	0.024	١.397	0.033	12
			Weg→Min →Os→Rh	0.010	١.407	0.014	5.1
			Weg→Ser→Rpulab→Rh	0.008	١.988	0.017	6
			Weg→Ser→Mi→Rh	0.019	2.159	0.041	14.9
Con (D11)	Uh	0.794	Con→Uplab→Uh	0.065	١.619	0.105	13.2
			Con→Mi→Uh	0.073	١.745	0.127	16
			Con→Oi→Mi→Uh	0.017	2.270	0.038	4.7
			Con→Ser→Upulab→Uh	0.045	2.020	0.091	11.4
			Con→Ser→ Mi →Uh	0.054	2.098	0.113	14.2
			Con→ Ser→ Os →Uh	0.014	2.032	0.028	3.5
			Con→ Oi→ Ser→Mi →Uh	0.009	2.693	0.024	3

Table 7: Cont…..

(1) Path origin (i) →	(2) Path Destination (j)	(3) Global Influence $I^G(i \rightarrow j)$= Maji	(4) Elementary Paths (i→j)	(5) Direct Influence $I^D(i \rightarrow j) \times p$	(6) path multiplier M=	(7) Total Influence $I^T(i \rightarrow j)P$	(8) $\frac{I^T(i \rightarrow j)}{I^G(i \rightarrow j)}$ (percent)
Con (D12)	Rh	0.360	Con→Rplab→Rh	0.061	١.277	0.075	20.7
			Con→Mi→ Rh	0.036	١.522	0.054	15.1
			Con→Oi→Mi→ Rh	0.008	2.008	0.016	4.6
			Con →Ser→ Rpulab → Rh	0.012	١.885	0.022	6.1
			Con→ Ser →Mi→ Rh	0.026	2.050	0.054	15
			Con→Oi → Ser →Mi→ Rh	0.004	2.647	0.012	3.2
Ser (D13)	Uh	0.935	Ser→Uplab→Uh	0.025	2.016	0.050	5.3
			Ser→Upulab→Uh	0.148	2.016	2.298	31.9
			Ser→Mi→Uh	0.176	2.094	0.369	39.5
			Ser→Os→Uh	0.046	2.028	0.092	9.9
			Ser→Os→Com→Uh	0.017	2.220	0.037	4
Ser (D14)	Rh	0.364	Ser→Rplab→Rh	0.007	١.881	0.013	3.5
			Ser→Ruplab→Rh	0.038	١.881	0.072	19.7
			Ser→Mi→Rh	0.087	2.046	0.178	48.8
			Ser→Os→Rh	0.08	١.923	0.034	9.4

accounts (production, factors and institutions), the 1970 and 1972 SAMs include two endogenous accounts.

1.1. Accounting Multiplier.

For analytical purposes, it is required that the endogenous part of the transaction matrices of the two sets of the above SAMs, i.e. 1970, 1972 and 1996, 2000 in Tables 1 and 2 be converted into a corresponding average expenditure propensities. This can be obtained simply be dividing a particular element in any of the endogenous accounts by the sum of total expenditure for the column account in which the element occurs. (Thorbeck and Hang Song 1996). Thereafter, on the basis of the derived average expenditures for each of the four SAMs, the corresponding accounting multiplier for two sets of SAM can be expressed as follows.

$$y_n = (I - B_n)^{-1} x = Max \qquad (1)$$

$$\bar{y}_n = (I - \bar{B}_n)^{-1} \bar{x} = \bar{M}a\bar{x} \qquad (2)$$

Equations (1) and (2), $(I - B_n)^{-1}$ and $(I - \bar{B}_n)^{-1}$ represent the accounting multiplier matrices for 1970, 1972 and 1996 and 2000 SAMs. They explained the results obtained in a SAM and not the process by which they are generated (Khan and Thorbeck, 1989).

In the application and use of Ma and $\bar{M}a$ matrices for socio- economic analyses, we need to accept at least two major assumptions.

١- There exists excess capacity which would allow all prices to remain constant and that expenditure propensities of endogenous accounts remain constant.

٢- The production technology and resource endowments in a specific period are given (Thorbeck, 1997). While these assumptions may limit the flexibilities of Ma and $\bar{M}a$ matrices for socio- economic policies analyses, as compared to other multipliers like fixed price multiplier, they can reveal a comprehensive picture of the economic structure (Banouei and Asgari, 2003).

1.2. Structural Path Analysis

The accounting multiplier matrix approach shown in equations (1) and (2) generally provide the global (direct and indirect) effects of injections, from exogenous variables $(x,\bar{x})$ on endogenous variable $(y_n,\bar{y}_n)$ via Ma or $\overline{Ma}$ matrices.

Such an effect may reduce the usefulness of such an approach for analysts and policy makers. Recently Defounry and Thorbecke (1984), Khan and Thorbecke (1989) and Azis (2000) have shown that the global effect can be decomposed by structural path analysis, and therefore throw light on the complexities of the socio-economic production process. Therefore, in contrast with the Accounting Multiplier Matrix (which gives scalar numbers), structural path analysis reveal specific individual sectors like activities, factors and household groups through which influence is transmitted from one sector of origin to its ultimate destination in a socio-economic system represented by a SAM.

Using this approach, it is possible to distinguish and recognize four influences. They are as follows:

I- Direct Influences of i on j along an Arc

$$I^D(i \rightarrow j) = a_{ji} \qquad (3)$$

Where I denotes the magnitude (intensity) of influence of i on j along an arc. D represents that the influence is direct, a_{ji} being the $(j,i)th$ element of the matrix of average expenditure propensities B_n [2].

II- Direct Influence along an Elementary Path

The direct influence transmitted from a pole i to a pole j along a given elementary path is equal to the product of the intensities of the arcs constituting the path. Therefore,

$$I^D(i...j) = a_{jn}...a_{mi} \qquad (4)$$

If p= (i,x,y,j), from equation (4) the intensity of influence along along an elementary path with three arcs can be expressed as follows:

$$I^D(i...j)p \equiv ID(i,x,y,j) = axiayxajy \qquad (5)$$

Where p shows the number of paths

III- Total Influence

Direct influence of i on j along an arc or along an elementary path cannot reveal the indirect influences that are generated on some of the paths in the form of loops, circuits and networks. To unveil these indirect effects, total influence is used. i.e.

$$I^T(i \to j)p = ID(i \to j)PMP \qquad (6)$$

Mp, a scalar captures the extent to which the direct influence along Path p is amplified through the effects of adjacent feedback circuits [3].

IV- Global influence

Global influence is directly obtained from the accounting multiplier matrix M_{aij} as it captures the full effects of an exogenous injection -dxi on the endogenous variable j. Therefore,

$$IG(i \to j) = M_{aji} \qquad (7)$$

and matrice $Ma(I - B_n)^{-1}$ and $\overline{Ma}(I - \overline{B}_n)^{-1}$, not shown in SPA, can be called the matrices of global influence of two sets of SAMS. The flexibility of the structural path analysis is that it can decompose global influence into a series of total influences. The latter, in turn, can be broken down into a series of direct influences multiplied by a quantity (scalar) called the path multiplier. Therefore, the Equation(7) can be decomposed as follows:

$$I^G(i \to j) = maij = \sum_{p=1}^{n} I^t(i \to j) = \sum_{p=1}^{n} I^D(i \to j)PMP$$

where $I^G(i \to j)$ represents global influence of Pole j and p stands for elementary path. To illuminate the structure of production with urban-rural income inequalities in Iran, all four influences have been used.

2-Data Base and Data Adjustments

The 1970 and 1972 SAMs which were constructed by Pyatt and his associates (Pyatt,et. al,1972), Contains 22 rows and columns .Twelve sectors in production accounts, 3 household groups in institutional account, government account, direct and indirect taxes. Capital account has been broken into private saving ,public saving and foreign saving , A single row and column for the rest of world account. The 1996 SAM was constructed jointly by Economic Research Center, Faculty of Economics, Allomeh Tabatabaei University, Statistical Centre of Iran and Central Bank of Iran. This matrix contains 94 rows and columns. The 2000 SAM has been compiled by the Research Centre of Parliament which consists of 44 rows and columns (Banouei, 2005).

For operational purposes of the above SAMs, the following adjustments have been made:

- The disaggregated of the production accounts of all four SAM have been culled into seven sectors: agriculture, mining, agro-based industries, other industries, water electricity and gas, construction and services.
- In the institutional accounts two household groups: urban households and rural households have been distinguished.
- Factor accounts for 1996 and 2000 SAMs have been regrouped into 6 groups of factors: urban and rural private employment compensations, urban and rural public employment compensation, mixed income and capital income (operational surplus without mixed income).
- The remaining accounts: government, taxes, capital and the rest of world accounts are taken as exogenous accounts.

3. Empirical Results and Analysis

In order to quantitatively analyse the structure of production with emphasis on institutional income distribution, i.e. urban and rural income inequality, the global effect of a unit increase (additional increase of one billion Rls) in exogenous account of each of the seven sectors and its decomposition components such as direct influence and total influence on increase urban-rural hold house incomes for the years 1970, 1972, 1996 and 200, have been estimated and the results are shown in Tables 3,4,5,6 and 7.

3.1- Global Influences On Institutional Income Distribution

The results of the global influences of a unit increase of exogenous variables (Path Of Origin) of all seven sectors on additional increase of urban-rural hold house incomes for the years 1970, 1972, 1996 and 2000 are presented in Table 3. The results shows that:

- The policies of the sectoral expansions during the past three decades were not effective to bridge the institutional income inequalities. Considering the structure of mono-economy of Iran, it seems that such a phenomenon is likely to be unavoidable and would persist in the future.
- The rural-urban income differentials in agriculture in 1970 and 1972 is less and shows an upward trend in 1996 and 2000. The performance of the other sectors shows the opposite direction.
- The results show that the urban-rural income inequalities are concentrated more on mining, water, electricity and gas, other industries and services. Therefore, we do not expect that the development of these sectors would reduce the income inequality, solve persistent acute unemployment and reduce the poverty in Iran.
- As compared to the other sectors of the economy, the results show that the urban-rural income gap for agriculture and agro based industries is less and therefore, it is expected that the policy of sectoral expansion of this sectors would potentially reduce the prevailing unemployment problem in Iran.

3.2. The Influence Of Production Activites On Institutional Income Distribution

The previous analysis and observation are based on global influences of a unit increase of exogenous variables of production activities on changes on urban-rural household incomes. From the policy point of view, however, such observations appear to be of limited usefulness as they do not identify the various paths along which an influence due to a unit increase exogenous variable of each production activity in transmitted. For this purpose, in order to visualize the complete picture of the complexities of the functioning of the structure of the economy, the impact of production activities on changes of the urban-rural household incomes for the years 1970,1972,1996 and 2000 in terms of global influences and its decomposed components have been estimated and results are shown in Tables 4 to 7 respectively.

The results of all tables are organized in columns : Columns 1 and 2 indicate the influence of production account (seven sectors, i.e, Path of Origin) on institutional accounts (urban-rural household i.e) Path of destination. Columns 3 represents global influences, i.e. Usual accounting multipliers and results are shown in Table 3. Column 4 shows different element paths through which the total global influences are transmitted. Columns 5 to 8 depict direct influence, path multiplier, total influence and percentage, ratio of total influence to global influence respectively.

As mentioned in the abstract of the paper, the complexities of functioning of structure of production and institutional income distribution are better portrayed in Tables 6 and 7 as compared to Tables 4 and 5. Tables 4 and 5 show the global influence and its decomposed components of a unit increase (one billion Rls) of exogenous variables of seven sectors on the additional increase of urban-rural household incomes. The results shows that:

- There is a direct linkage between agriculture and urban-rural household incomes. Out of 1.594 units of household income generated in

agriculture, 41.3 percent is channelized through a direct path (Table 4, Case A_1) whereas the share of rural household is 94.1 percent (Table 4, Case A_2). The direct linkage for urban household in 1972 boils down to 38 and 23 percent and is revealed through indirect path where service sector plays an important role (Table 5, Case B_1). The share of rural house hold remains unchanged (Table 5, Case B_2).

- Direct interaction between Mining sector and urban household is observed, however, for rural household it is rather indirect. This is true for 1970 and 1972 (Tables 4 and 5, cases A_2, A_3 and B_2 and B_3). Out of 1.256 units of urban household income generated in mining sector in 1970, 92.8 percent are caused directly and in 1972. The share has increased to 93.5 percent. The shares of rural household income in 1970 and 1972 are 51.5 and 52.7 percent respectively. These shares are of indirect nature which revealed through indirect path where urban households and agro-based industries play an important role in increasing rural household incomes.
- 45.7 percent of total urban household income of 1.605 unit generated in agro-based industries in 1970 is directly transmitted. In 1972 this share increased to 46.2 percent (Tables 4 and 5, Cases A5, A6 and B5, B6). These linkages for rural household are indirect. As 43.4 percent out of 0.653 unit of rural household incomes in 1970 is concentrated in a path where agriculture play an important role in generating more additional income to rural households. The similar path in 1972 is 34.1 percent.
- For other sectors of the economy such as other industries, water, electricity and gas, construction and services, the urban households benefit directly from all the sectors, however gains of rural households are mainly indirect. For instance, out of total income of 1.731 and 1.856 of urban households accrued in water, electricity and gas, and service sectors in 1970, 31.6 percent and 91.7 percent are caused directly. The percentage shares for 1972 for the same sectors are 81.1 and 92.4 respectively (Tables 4 and 5, Cases A9, A13 and B9, B13). The percentage shares of rural households for the same sectors in 1970 are 43.3 and 40.2 and in 1972 are 41.7 and 37.5(cases A_{10}, A_{14} and B_{10}, B_{14}).The above results are derived

from 1970 and 1972 SAMs in which factor accounts have not been considered, and therefore the impact of production activities on urban and rural household incomes on different paths cannot reveal which factors of production are the main cause of additional increase of urban and rural households income in the economy. The results of Tables 6 and 7 which are based on 1996 and 2000 SAMs reveal such complexities of socio-economic production processes. No doubt, by looking at the structural path analysis of Tables 6 and 7, one may throwlight on such aspects and d raw some policy implications. The overall results and their analysis are briefly presented as follows .

- Cases C_1 and C_2 of the Table 6 reveal the global influences and their decomposed components of agriculture on the urban and rural household incomes It is observed that out of a total income of 1.283 unit accrued to urban household in 1996, 63.8 percent is channelized through agriculture, mixed income and urban household nexus, whereas for rural household the share is 59.1 percent. The similar shares in 2000 for urban and rural households in the same sectors are 73.3 and 68.3 percent in which mixed income is solely responsible for additional increase of urban and rural household incomes (Cases D_1 and D_2, Table 7).
- These results would suggest that the additional mixed income generated in the agricultural sector brings highest income to urban households as compared to rural households and show increasing trend in 2000 as compared to 1996.
- Rural rather urban households, gain almost three times more through agriculture- rural private labour nexus when considering similar paths (15.6% in case C_2 to 44% in case B_1 in 1996). These shares have come down in 2000 to 15.2% and 3.6 percent respectively (Cases D_1 and D_2, Table 7).
- Cases C_3, C_4 and D_3, D_4, which illustrate the influence of mining sector (with predominance of crude oil and natural gas) on the urban and rural household incomes in 1996 and 2000, show that out of 0.534 units of urban household income in 1996, 46.5% is mainly caused by operational

surplus (capital income) where as the share of rural household income is 15.5 percent. These shares for urban-rural households has increased to 61.2 percent and 54.2% respectively in 2000 (Cases D_3 and D_4 Table 7). The results also reveal that private labour incomes do have very meager shares in raising both urban and rural incomes in years 1996 and 2000. However, the role of public labour income in generating additional household incomes in 1996 are two times more for urban households than rural households (Cases C_3 and C_4, Table 6). For year 2000. it is observed that public labour income contributed only 4.4% of urban household income whereas for rural household income, it appears to have negligible share.

- Cases C_5 and C_6 of Table 6 in 1996 depict the effects of agro-based industries on the incomes of urban and rural households. The figures show that out of 1.128 unit of additional income of urban households, 29.5% is disclosed in a path where agro-based industries is linked to agriculture, mixed income and urban households. The share of similar path for rural household is 30.1%. Private labour income in generating additional urban-rural household incomes are 5.9 and 4.8 respectively. The role of mixed income in generating additional urban-rural income in 2000 has reduced to 26.2% and 25.9 percent, however, the share of private labour income in creating additional urban and rural household incomes in 2000 has increased to 8.2% and 8% respectively (Cases D5 and D6, Table 7).
- The results of the effects of construction sector on the urban and rural incomes of households (Cases C_{11} and C_{12} in 1996) suggest that the urban and rural households gain more from private labour incomes. As out of 0.978 units of additional income accrued by the urban households, 18.8% is exercised through a path where construction links with private labour income. The similar path has more effects on generating rural household income 23.4% is caused in a path where construction sector contributes additional income to private labour and hence more additional income to rural households. The results of Table 7 in 2000 (Cases D_{11} and D_{12}) show that the role of private labour in generating additional incomes of both urban and rural households has reduced. As out of 0.974 of total

additional incomes of urban households generated in construction sector, 13.2% and 20.7% are concentrated in a path where private labour income is the main cause of increasing both urban and rural household incomes. The decreasing share of private labour income is compensated by increasing shares of other paths. Considering the cases of C_{13} and C_{14} of Table 6 in 1996, we observe that both urban and rural households gain from two distinct paths due to the expansion of the service sector. One is through additional income of urban public labour and the other is the additional mixed incomes. Glancing at the results of case C_{13} ,we can discern that, out of total additional income of 1.076 unit for urban households, 44.7% is unveiled in a path where service sector creates more more mixed income and hence more additional incomes. In this case 27.6 percent of additional incomes of urban households is caused through a path where the role of public labour is significant. Mixed income has more contributing share in revealing the major part of the total additional of 0.415 unit of rural households income. As 56% is disclosed in a sigle path where service sector generates more mixed income. Whereas 18.4% is caused through a path in which rural public labour plays important role in increasing rural households income. The picture in 2000 (cases D_{13} and D_{13} Table 7) is somewhat different. The role of public labour in generating additional income for both urban and rural households has increased to 32% and 20% whereas the shares of mixed incomes has come down to 39.5% and 49% in 2000.

۵. Summary and Conclusions

To explore some of the structures of production with emphasis on institutional income distribution, we have used four SAMs of 1970,1972, 1996 and 2000. For this purpose we have employed structural path analysis which can provide global influences of one account on the other account and its decomposed components in terms of the seven major sectors Iranian economy on the following accounts: urban household incomes and rural household incomes.

The results of global influence on urban and rural household incomes show that

- The policies of sectoral expansions during the past three decades were not very effective to bridge the institutional income inequalities, and this is expected to persist in future.
- As compared to the other sectors of the economy agriculture and agro-based industries do have a better position in, narrowing urban and rural income inequalities, Therefore we suggest that policy of sectoral expansion of these sectors would potentially reduce the prevailing income inequalities in Iran.
- The above observations are concomitant with the results of the structural path analysis. In this case we observe that out of total additional incomes of urban and rural households generated in agriculture and agro based industries, the significant shares of total incomes are explained through direct paths as compared to the other sectors of economy which are of indirect nature.

Notes:

[1] According to the Report, the unemployment rate in year 2000 was 14.25 percent. It subsequently reduced to 14.2 and 13 percent in the year 2001 and 2002 and standard of living of rural households constitute 60 to 65 percent of urban households.

[2] Due to the lack of appropriate data in Iran, instead of using marginal expenditure propensities, we have used average expenditure propensities.

[3] The detailed proof of the equation (6) is given in an appendix in Defourney and Thorbecke (1984).

References

1- Pyatt, G (2001) some early multiplier models of the relationship between income distribution and the production structure Economic Systems Research, Vol. 13, No.2.

2- Banouei, A.A and Asgari, M (2002) Multiplier analysis of many producers and many consumers of the SAM for the Iranian economy, Quarterly Iranian Economic Research, Vol .4.

3- Banouei, A.A and Banouei, J(2004) Structure of production and urban-rural income inequalities in the framework of structural path analysis. Proceedings of Input-output and General Equilibrium Conference: Data, Modeling and Policy Analysis Brussels, Sept 2-4, 2004.

4- Khan, H.A. and Thorbecke, E.(1989) Macro Effects of technology Choice: Multiplier and Structural Path Analysis within a SAM Framework, Journal of policy Modeling, Vol. 11, No.1.

5- Azis, I.J. (2000). Simulating Economy-Wide Models to Capture the transition from Financial Crisis to Social Crisis, The Annals of Regional Science, Vol. 34.

6- Defourny, J and thorbecke, E.(1984) Structural path analysis and multiplier decomposition within a social accounting matrix framework, ,The Economic Journal ,Vol. 94.

7- Banouei, A.A. (1992a) Application of a dynamic system for planning in Iran, Economic systems Research, Vol4 , No.1.

8- Banouei, A.A. (1992b) Planning and development under the monarchy and the Islamic Government of Iran: A critical assessment, International Studies, Vol 29, No.1.

9- Prasad, K.N, Banouei, A.A. and Swaminathan, A.M. (1992). Trade Strategy and Development in India and Iran, Economic Systems Research, Vol.4, No.1.

10- Vakil, F. (1975) Iran's basic macro-economic problems: A twenty year horizon, Plan and Budget Organization, Planning Division, Tehran.

11- Bulmer-Thomas, V. and Zamani, H. (1989) Industrialization and income distribution in Iran since 1960: An input-output approach. Paper

presented at the 9 the International Conference on Input-Output Techniques, Kezsthely, Hungary.
12- Management and Planning Organization (2003) The 2002 Economic Report, Macroeconomic Bureau, Tehran, Iran (in Persian).
13- Banouei, A.A. (2005) An analysis of income distribution and increase in production in Iran using SAM, Quarterly Iranian Economic Research (in Persian, In Press).