

# **An Exploration into Recent Input-Output Multiplier Innovations**

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# Missing Sectors Are Not Unusual in IMPLAN

## What is and What is Not Located in Boone County, Missouri: 2007 IMPLAN and County Business Patterns

IMPLAN Industry Data File				Sectors Not Found in IMPLAN								
				CBP Data: Boone County, Missouri								
Ind	IMPLAN Description	Ind Out	Emp	naics	empflag	emp_nf	emp	qp1_nf	qp1	ap_nf	ap	est
33	Water, sewage and other systems	\$0.000	0	221310	B	D	0	D	0	D	0	2
60	Poultry processing	\$0.000	0	311615	F	D	0	D	0	D	0	1
65	Snack food manufacturing	\$0.000	0	311919	C	D	0	D	0	D	0	1
68	Seasoning and dressing manufacturing	\$0.000	0	311941	A	D	0	D	0	D	0	1
87	Cut and sew apparel contractors	\$0.000	0	315212	A	D	0	D	0	D	0	1
91	Apparel accessories and other apparel manufacturing	\$0.000	0	315999	A	D	0	D	0	D	0	1
99	Wood windows and doors and millwork	\$0.000	0	321912	A	D	0	D	0	D	0	1
119	All other petroleum and coal products manufacturing	\$0.000	0	324199	B	D	0	D	0	D	0	1
133	Pharmaceutical preparation manufacturing	\$0.000	0	325412	A	D	0	D	0	D	0	1
147	Urethane and other foam product (except polystyrene)	\$0.000	0	326150	B	D	0	D	0	D	0	1
148	Plastics bottle manufacturing	\$0.000	0	326160	A	D	0	D	0	D	0	1
188	Power boiler and heat exchanger manufacturing	\$0.000	0	332410	A	D	0	D	0	D	0	1
215	Heating equipment (except warm air furnaces) manufa	\$0.000	0	333414	E	D	0	D	0	D	0	1
225	Other engine equipment manufacturing	\$0.000	0	333618	A	D	0	D	0	D	0	1
228	Material handling equipment manufacturing	\$0.000	0	333922	A	D	0	D	0	D	0	1
242	Bare printed circuit board manufacturing	\$0.000	0	334412	F	D	0	D	0	D	0	1
243	Semiconductor and related device manufacturing	\$0.000	0	334413	B	D	0	D	0	D	0	1
294	All other transportation equipment manufacturing	\$0.000	0	336999	A	D	0	D	0	D	0	1
310	Jewelry and silverware manufacturing	\$0.000	0	339911	A	D	0	D	0	D	0	1
385	Facilities support services	\$0.000	0	561210	B	D	0	D	0	D	0	1
				CBP empflag codes			A	0-19		E	250-499	
						B	20-99		F	500-999		
						C	100-249					

# Our Story

- **A new firm or sector should offer the potential for**
  - **New local employment opportunities**
  - **A new market for existing firms to sell locally**
  - **New locally available resources (goods and services) for existing firms**
- **The IO column multipliers should either**
  - **Not change if none of the above occurs or**
  - **Rise when one or more of the above occur**
    - **Buy more locally (Import substitution)**
    - **Sell more locally (output expansion or reduce exports)**

# Recent Economic Impact Study

- **A small auto parts manufacturing plant**
  - Located in Cross County, Arkansas
  - Plastic parts & other decorative interior and exterior trims for the automotive industry
  - Also, they make complex modular assemblies
- **Business particulars**
  - IMPLAN sector 283 (NAICS 3363)
  - 30 employees (FTE)
  - Average pay is \$12.87 per hour

# IMPLAN did not have a sector 283 in Cross County, AR—so we created it & reconstructed the model via trade flow method

Cross County, AR: IMPLAN Trade Flow Type SAM Output Multipliers									
Code	Description	Employment Size of Target Sector (283)							
		0	1	5	10	30	50	100	500
283	Motor vehicle parts manufacturing	0.0000	1.2115	1.2113	1.2110	1.2101	1.2091	1.2068	1.1868
358	Insurance agencies, brokerages, and rela	1.5993	1.5993	1.5992	1.5990	1.5984	1.5978	1.5962	1.5810
425	Civic, social, professional, and similar org	1.5440	1.5440	1.5438	1.5437	1.5430	1.5424	1.5408	1.5145
424	Grantmaking, giving, and social advocacy	1.5367	1.5367	1.5366	1.5364	1.5358	1.5352	1.5336	1.5052
19	Support activities for agriculture and for	1.4789	1.4789	1.4788	1.4788	1.4784	1.4781	1.4773	1.4489
372	Computer systems design services	1.4604	1.4603	1.4602	1.4601	1.4595	1.4589	1.4575	1.4342
401	Community food, housing, and other rel	1.4323	1.4323	1.4322	1.4321	1.4315	1.4310	1.4297	1.4060
355	Nondepository credit intermediation and	1.4287	1.4287	1.4286	1.4284	1.4279	1.4273	1.4260	1.4084
427	US Postal Service	1.4223	1.4223	1.4222	1.4221	1.4217	1.4213	1.4202	1.3967
348	Radio and television broadcasting	1.4204	1.4204	1.4204	1.4203	1.4200	1.4197	1.4190	1.4003
376	Scientific research and development serv	1.4115	1.4115	1.4113	1.4111	1.4103	1.4095	1.4075	1.3850

# Then we tried IMPLAN's econometric method

Cross County, AR: IMPLAN Econometric Type SAM Output Multipliers									
Code	Description	Employment Size of Target Sector (283)							
		0	1	5	10	30	50	100	500
283	Motor vehicle parts manufacturing	0.0000	1.2614	1.2968	1.3080	1.3259	1.3335	1.3422	1.3362
358	Insurance agencies, brokerages, and r	1.3938	1.3940	1.3947	1.3949	1.3952	1.3953	1.3953	1.3869
425	Civic, social, professional, and similar	1.5372	1.5376	1.5389	1.5394	1.5403	1.5409	1.5418	1.5211
424	Grantmaking, giving, and social advoc	1.5734	1.5741	1.5763	1.5770	1.5784	1.5792	1.5805	1.5571
19	Support activities for agriculture and f	1.5246	1.5251	1.5266	1.5272	1.5286	1.5296	1.5317	1.5057
372	Computer systems design services	1.4951	1.4954	1.4964	1.4967	1.4975	1.4980	1.4989	1.4788
401	Community food, housing, and other	1.4598	1.4608	1.4642	1.4653	1.4673	1.4683	1.4698	1.4504
355	Nondepository credit intermediation	1.3592	1.3594	1.3600	1.3601	1.3604	1.3604	1.3604	1.3462
427	US Postal Service	1.4603	1.4639	1.4763	1.4803	1.4870	1.4900	1.4941	1.4784
348	Radio and television broadcasting	1.4574	1.4576	1.4584	1.4588	1.4595	1.4601	1.4612	1.4447
376	Scientific research and development s	1.4144	1.4150	1.4172	1.4178	1.4189	1.4194	1.4199	1.4037

Hey, this was supposed to be one of those "quick and dirty" impact assessments !!

# So, we looked at other sectors in other parts of Arkansas

Craighead County, AR (target sector 32)			Employment Size of Target Sector (32)							
	Code	Description	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	32	Natural gas distribution	0.0000	1.1456	1.1448	1.1439	1.1408	1.1385	1.1344	1.1233
	357	Insurance carriers	1.9352	1.9352	1.9350	1.9349	1.9343	1.9337	1.9322	1.9213
	358	Insurance agencies, brokerages, and	1.8426	1.8425	1.8424	1.8422	1.8415	1.8408	1.8391	1.8265
	346	Motion picture and video industri	1.8099	1.8098	1.8097	1.8096	1.8090	1.8085	1.8074	1.7984
	404	Promoters of performing arts and	1.8083	1.8082	1.8081	1.8079	1.8074	1.8069	1.8057	1.7965
	424	Grant making, giving, and social ac	1.8037	1.8036	1.8034	1.8031	1.8022	1.8014	1.7992	1.7830
	425	Civic, social, professional, and sim	1.7914	1.7913	1.7911	1.7908	1.7898	1.7888	1.7865	1.7691
	372	Computer systems design services	1.7541	1.7540	1.7538	1.7535	1.7525	1.7516	1.7492	1.7314
	371	Custom computer programming se	1.7191	1.7190	1.7189	1.7186	1.7178	1.7171	1.7152	1.7012
	401	Community food, housing, and ot	1.7177	1.7177	1.7174	1.7172	1.7162	1.7153	1.7130	1.6958
	59	Animal (except poultry) slaughteri	1.7015	1.7014	1.7013	1.7011	1.7007	1.7004	1.6996	1.6937
	Code	Description	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	32	Natural gas distribution	0.0000	1.1938	1.1915	1.1888	1.1802	1.1732	1.1606	1.1309
	357	Insurance carriers	1.5014	1.5014	1.5015	1.5016	1.5021	1.5021	1.5013	1.4959
	358	Insurance agencies, brokerages, and	1.5770	1.5770	1.5773	1.5775	1.5787	1.5787	1.5775	1.5692
	346	Motion picture and video industri	1.7259	1.7260	1.7262	1.7266	1.7278	1.7280	1.7271	1.7219
	404	Promoters of performing arts and	1.6173	1.6174	1.6177	1.6180	1.6194	1.6196	1.6188	1.6135
	424	Grant making, giving, and social ac	1.7613	1.7614	1.7616	1.7620	1.7634	1.7633	1.7614	1.7484
	425	Civic, social, professional, and sim	1.7104	1.7106	1.7113	1.7122	1.7156	1.7163	1.7146	1.7032
	372	Computer systems design services	1.7012	1.7013	1.7015	1.7018	1.7030	1.7029	1.7008	1.6865
	371	Custom computer programming se	1.6385	1.6386	1.6387	1.6390	1.6399	1.6398	1.6381	1.6269
	401	Community food, housing, and ot	1.6875	1.6876	1.6880	1.6885	1.6904	1.6905	1.6884	1.6736
	59	Animal (except poultry) slaughteri	1.4064	1.4066	1.4077	1.4090	1.4143	1.4159	1.4150	1.4100

Drew County, AR (target sector 4)			Employment Size of Target Sector (4)							
	Code	Description	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	4	Fruit farming	0.0000	1.2334	1.2332	1.2330	1.2319	1.2309	1.2286	1.2140
	95	Sawmills and wood preservation	1.8195	1.8195	1.8194	1.8192	1.8187	1.8182	1.8170	1.8085
	16	Commercial logging	1.6275	1.6275	1.6274	1.6273	1.6267	1.6262	1.6250	1.6172
	358	Insurance agencies, brokerages, and	1.6199	1.6199	1.6198	1.6197	1.6191	1.6186	1.6173	1.6073
	357	Insurance carriers	1.6040	1.6040	1.6039	1.6038	1.6034	1.6029	1.6018	1.5934
	425	Civic, social, professional, and sim	1.5012	1.5011	1.5009	1.5006	1.4996	1.4985	1.4958	1.4759
	19	Support activities for agriculture a	1.4666	1.4665	1.4663	1.4660	1.4650	1.4639	1.4614	1.4418
	355	Nondepository credit intermediat	1.4423	1.4422	1.4421	1.4419	1.4411	1.4404	1.4386	1.4248
	424	Grant making, giving, and social a	1.4404	1.4403	1.4402	1.4401	1.4394	1.4388	1.4373	1.4259
	99	Wood windows and doors and mi	1.4374	1.4373	1.4373	1.4372	1.4367	1.4363	1.4352	1.4276
11	Cattle ranching and farming	1.4362	1.4361	1.4358	1.4354	1.4340	1.4326	1.4291	1.4035	
	Code	Description	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	4	Fruit farming	0.0000	1.4322	1.4340	1.4350	1.4357	1.4355	1.4304	1.3633
	95	Sawmills and wood preservation	1.9073	1.9073	1.9074	1.9074	1.9071	1.9068	1.9056	1.8939
	16	Commercial logging	1.5813	1.5814	1.5814	1.5814	1.5813	1.5810	1.5795	1.5618
	358	Insurance agencies, brokerages, and	1.4244	1.4244	1.4244	1.4244	1.4242	1.4239	1.4231	1.4167
	357	Insurance carriers	1.3622	1.3622	1.3623	1.3623	1.3621	1.3619	1.3613	1.3565
	425	Civic, social, professional, and sim	1.4828	1.4829	1.4830	1.4829	1.4825	1.4820	1.4806	1.4699
	19	Support activities for agriculture a	1.5016	1.5016	1.5018	1.5018	1.5012	1.5003	1.4981	1.4803
	355	Nondepository credit intermediat	1.3748	1.3749	1.3749	1.3749	1.3746	1.3743	1.3734	1.3665
	424	Grant making, giving, and social a	1.4655	1.4655	1.4656	1.4656	1.4652	1.4648	1.4636	1.4543
	99	Wood windows and doors and mi	1.6649	1.6649	1.6650	1.6650	1.6647	1.6644	1.6634	1.6555
11	Cattle ranching and farming	1.4362	1.4362	1.4362	1.4361	1.4357	1.4353	1.4337	1.4166	

Lee County, AR (target sector 359)			Employment Size of Target Sector (359)							
	Code	Description	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	359	Funds, trusts, and other financial	0.0000	1.1497	1.1358	1.1232	1.0961	1.0836	1.0695	1.0446
	19	Support activities for agriculture a	1.1775	1.1774	1.1771	1.1768	1.1761	1.1756	1.1748	1.1510
	401	Community food, housing, and ot	1.1542	1.1540	1.1531	1.1523	1.1504	1.1494	1.1478	1.1219
	425	Civic, social, professional, and sim	1.1518	1.1513	1.1497	1.1481	1.1445	1.1424	1.1392	1.1173
	6	Greenhouse, nursery, and floricult	1.1515	1.1515	1.1513	1.1510	1.1505	1.1502	1.1495	1.1346
	424	Grant making, giving, and social a	1.1495	1.1488	1.1464	1.1442	1.1387	1.1356	1.1309	1.1063
	409	Amusement parks, arcades, and g	1.1494	1.1493	1.1489	1.1484	1.1468	1.1455	1.1425	1.1247
	374	Management, scientific, and techn	1.1423	1.1422	1.1417	1.1412	1.1396	1.1384	1.1360	1.1188
	427	US Postal Service	1.1421	1.1420	1.1417	1.1415	1.1407	1.1403	1.1395	1.1150
	398	Nursing and residential care facilit	1.1398	1.1398	1.1395	1.1392	1.1384	1.1379	1.1368	1.1168
367	Legal services	1.1365	1.1364	1.1360	1.1357	1.1346	1.1339	1.1324	1.1179	
	Code	Description	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	359	Funds, trusts, and other financial	0.0000	1.3162	1.2862	1.2577	1.1977	1.1702	1.1399	1.0895
	19	Support activities for agriculture a	1.3623	1.3644	1.3681	1.3672	1.3652	1.3641	1.3624	1.3131
	401	Community food, housing, and ot	1.3164	1.3171	1.3177	1.3158	1.3116	1.3094	1.3064	1.2547
	425	Civic, social, professional, and sim	1.3044	1.3092	1.3168	1.3130	1.3042	1.2995	1.2927	1.2489
	6	Greenhouse, nursery, and floricult	1.3032	1.3043	1.3062	1.3057	1.3043	1.3036	1.3023	1.2707
	424	Grant making, giving, and social a	1.3122	1.3113	1.3074	1.3023	1.2903	1.2837	1.2738	1.2247
	409	Amusement parks, arcades, and g	1.3304	1.3306	1.3305	1.3295	1.3264	1.3240	1.3188	1.2863
	374	Management, scientific, and techn	1.2856	1.2865	1.2877	1.2866	1.2835	1.2813	1.2771	1.2461
	427	US Postal Service	1.3333	1.3343	1.3360	1.3352	1.3335	1.3324	1.3308	1.2803
	398	Nursing and residential care facilit	1.2836	1.2849	1.2870	1.2863	1.2844	1.2832	1.2813	1.2408
367	Legal services	1.2631	1.2641	1.2656	1.2647	1.2625	1.2610	1.2583	1.2304	

Pulaski County, AR (target sector 58)			Employment Size of Target Sector (58)							
	Code	Description	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	58	Ice cream and frozen dessert man	0.0000	1.6721	1.6715	1.6706	1.6669	1.6633	1.6547	1.6057
	359	Funds, trusts, and other financial	2.6369	2.6369	2.6368	2.6368	2.6365	2.6363	2.6357	2.6314
	424	Grant making, giving, and social a	2.2371	2.2371	2.2371	2.2370	2.2367	2.2364	2.2356	2.2300
	425	Civic, social, professional, and sim	2.0950	2.0950	2.0949	2.0948	2.0946	2.0943	2.0936	2.0887
	357	Insurance carriers	2.0651	2.0651	2.0651	2.0650	2.0649	2.0647	2.0643	2.0614
	356	Securities, commodity contracts, i	2.0362	2.0361	2.0361	2.0361	2.0358	2.0356	2.0350	2.0309
	409	Amusement parks, arcades, and g	2.0119	2.0119	2.0118	2.0117	2.0114	2.0111	2.0103	2.0041
	348	Radio and television broadcasting	1.9897	1.9897	1.9897	1.9896	1.9894	1.9892	1.9888	1.9853
	403	Spectator sports companies	1.9699	1.9698	1.9698	1.9697	1.9694	1.9692	1.9685	1.9632
	404	Promoters of performing arts and	1.9357	1.9357	1.9357	1.9356	1.9354	1.9352	1.9347	1.9308
	365	Commercial and industrial machin	1.9337	1.9336	1.9336	1.9335	1.9331	1.9327	1.9318	1.9245
	Code	Description	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	58	Ice cream and frozen dessert man	0.0000	1.4660	1.4740	1.4841	1.5014	1.5058	1.5108	1.5166
	359	Funds, trusts, and other financial	1.9041	1.9041	1.9041	1.9041	1.9042	1.9042	1.9042	1.9038
	424	Grant making, giving, and social a	1.8545	1.8545	1.8546	1.8547	1.8549	1.8549	1.8548	1.8539
	425	Civic, social, professional, and sim	1.7598	1.7598	1.7599	1.7600	1.7602	1.7602	1.7602	1.7593
	357	Insurance carriers	1.4773	1.4773	1.4774	1.4774	1.4775	1.4775	1.4774	1.4771
	356	Securities, commodity contracts, i	1.6404	1.6404	1.6404	1.6405	1.6406	1.6406	1.6405	1.6400
	409	Amusement parks, arcades, and g	1.6091	1.6092	1.6093	1.6096	1.6100	1.6101	1.6103	1.6108
	348	Radio and television broadcasting	1.7545	1.7545	1.7546	1.7547	1.7549	1.7549	1.7549	1.7547
	403	Spectator sports companies	1.6246	1.6246	1.6247	1.6248	1.6250	1.6253	1.6257	1.6292
	404	Promoters of performing arts and	1.5862	1.5862	1.5863	1.5863	1.5864	1.5864	1.5864	1.5859
	365	Commercial and industrial machin	1.5821	1.5821	1.5821	1.5822	1.5822	1.5822	1.5822	1.5817

Washington County, AR (target sector 385)			Employment Size of Target Sector (385)							
	Code	Description	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	385	Facilities support services	0.0000	1.3935	1.3935	1.3934	1.3933	1.3932	1.3928	1.3900
	424	Grant making, giving, and social a	1.6960	1.6960	1.6960	1.6960	1.6958	1.6957	1.6953	1.6923
	341	Newspaper publishers	1.6637	1.6637	1.6636	1.6636	1.6636	1.6635	1.6633	1.6620
	350	Internet publishing and broadcast	1.6496	1.6496	1.6496	1.6495	1.6494	1.6493	1.6491	1.6471
	425	Civic, social, professional, and sim	1.5867	1.5867	1.5867	1.5866	1.5865	1.5865	1.5862	1.5843
	357	Insurance carriers	1.5845	1.5845	1.5845	1.5845	1.5844	1.5844	1.5842	1.5830
	358	Insurance agencies, brokerages, a	1.5494	1.5494	1.5494	1.5494	1.5493	1.5492	1.5489	1.5469
	392	Private junior colleges, colleges, u	1.5294	1.5294	1.5294	1.5294	1.5293	1.5292	1.5290	1.5276
	372	Computer systems design services	1.4961	1.4961	1.4961	1.4960	1.4959	1.4958	1.4956	1.4937
	393	Other private educational services	1.4953	1.4953	1.4953	1.4953	1.4952	1.4951	1.4949	1.4931
401	Community food, housing, and ot	1.4942	1.4942	1.4942	1.4941	1.4941	1.4940	1.4937	1.4918	
	Code	Description	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	385	Facilities support services	0.0000	1.5694	1.5695	1.5696	1.5701	1.5699	1.5696	1.5665
	424	Grant making, giving, and social a	1.9222	1.9222	1.9222	1.9223	1.9224	1.9222	1.9218	1.9181
	341	Newspaper publishers	1.4036	1.4036	1.4036	1.4037	1.4038	1.4037	1.4036	1.4024
	350	Internet publishing and broadcast	1.3126	1.3126	1.3127	1.3127	1.3128	1.3128	1.3127	1.3121
	425	Civic, social, professional, and sim	1.7641	1.7641	1.7642	1.7642	1.7643	1.7642	1.7639	1.7618
	357	Insurance carriers	1.4686	1.4686	1.4687	1.4688	1.4691	1.4691	1.4689	1.4679
	358	Insurance agencies, brokerages, a	1.5633	1.5633	1.5635	1.5637	1.5644	1.5643	1.5641	1.5622
	392	Private junior colleges, colleges, u	1.7085	1.7085	1.7085	1.7085	1.7086	1.7085	1.7083	1.7070
	372	Computer systems design services	1.6944	1.6945	1.6945	1.6946	1.6948	1.6947	1.6944	1.6921
	393	Other private educational services	1.5477	1.5478	1.5478	1.5479	1.5483	1.5482	1.5480	1.5465
401	Community food, housing, and ot	1.7158	1.7158	1.7159	1.7160	1.7164	1.7163	1.7160	1.7138	

# **Inverse Relationship Between New Sector and Column Multipliers????**

- **Each region had several column sums of the industry-by-industry, regional input coefficient matrix greater than one**
- **Due to very large negative value added components**
- **Adjusted for the negative value added component and reconstructed the model**

			Neg VA	Negative Value Added Adjusted							
Pulaski County, AR (target sector 285)			Not Adj	Employment Size of Target Sector (385)							
	Code	Description	0	0	1	5	10	30	50	100	500
Trade Flow Method Type SAM Output Multipliers	285	Aircraft engine and engine parts m	0.0000	0.0000	1.4575	1.4575	1.4575	1.4573	1.4572	1.4568	1.4540
	359	Funds, trusts, and other financial	2.7431	2.7287	2.7286	2.7286	2.7285	2.7283	2.7281	2.7275	2.7228
	357	Insurance carriers	2.2942	2.2918	2.2918	2.2918	2.2918	2.2916	2.2915	2.2912	2.2885
	356	Securities, commodity contracts, i	2.1911	2.1695	2.1695	2.1695	2.1694	2.1693	2.1691	2.1687	2.1651
	4	Fruit farming	2.0779	1.8862	1.8862	1.8861	1.8861	1.8860	1.8859	1.8857	1.8839
	424	Grantmaking, giving, and social ad	2.0597	1.9823	1.9823	1.9823	1.9822	1.9821	1.9819	1.9815	1.9784
	358	Insurance agencies, brokerages, a	2.0347	2.0331	2.0331	2.0330	2.0330	2.0329	2.0327	2.0323	2.0295
	365	Commercial and industrial machin	2.0301	2.0283	2.0283	2.0282	2.0282	2.0279	2.0277	2.0272	2.0228
	185	Handtool manufacturing	2.0299	1.6685	1.6685	1.6685	1.6685	1.6683	1.6682	1.6678	1.6651
	362	Automotive equipment rental and	2.0084	2.0063	2.0063	2.0063	2.0062	2.0060	2.0058	2.0053	2.0013
	364	Video tape and disc rental	2.0005	1.9991	1.9991	1.9991	1.9990	1.9988	1.9986	1.9980	1.9934
	Code	Description	0	0	1	5	10	30	50	100	500
Econometric Method Type SAM Output Multipliers	285	Aircraft engine and engine parts m	0.0000	0.0000	1.3138	1.3181	1.3234	1.3448	1.3661	1.4191	1.5966
	359	Funds, trusts, and other financial	1.8983	1.8933	1.8933	1.8933	1.8933	1.8933	1.8932	1.8932	1.8927
	357	Insurance carriers	1.5737	1.5729	1.5729	1.5729	1.5729	1.5729	1.5729	1.5728	1.5723
	356	Securities, commodity contracts, i	1.7191	1.7074	1.7074	1.7074	1.7074	1.7073	1.7073	1.7072	1.7064
	4	Fruit farming	1.5560	1.4619	1.4619	1.4619	1.4619	1.4619	1.4619	1.4619	1.4615
	424	Grantmaking, giving, and social ad	1.7204	1.6686	1.6686	1.6686	1.6686	1.6686	1.6685	1.6684	1.6675
	358	Insurance agencies, brokerages, a	1.6140	1.6134	1.6134	1.6134	1.6134	1.6133	1.6133	1.6132	1.6123
	365	Commercial and industrial machin	1.6493	1.6485	1.6485	1.6485	1.6485	1.6485	1.6485	1.6484	1.6478
	185	Handtool manufacturing	1.7249	1.4710	1.4710	1.4710	1.4710	1.4709	1.4709	1.4708	1.4700
	362	Automotive equipment rental and	1.6300	1.6290	1.6290	1.6290	1.6290	1.6290	1.6290	1.6289	1.6283
	364	Video tape and disc rental	1.6407	1.6402	1.6402	1.6402	1.6402	1.6402	1.6402	1.6401	1.6396

# Conclusions and Recommendations

- **IMPLAN uses an iterative RAS procedure that dominates structural changes**
  - Seems to create local supply limitations
  - Raises existing firms' propensities to import as more firms are added to the local economy—especially for the trade flow multiplier procedure
  - Some other leakage not yet identified ????
- **Maybe we need a new balancing algorithm**
  - New BEA procedure (Baoline Chen, 2006)
  - Used for the National Annual Update IO tables
  - Simultaneously solves for IO balances using a GLS reconciliation method that optimally incorporates all available information

# Structural Change Methods for IO Models

- Existing IO and regional modeling methods (IMPLAN, REMI and RIMS too) do not handle structural change analysis very well
- Incremental IO structural changes
  - Non-linear or dynamic IO methods
  - Chung & Chong Liew, Randy Jackson & Guy West, and Thomas Johnson
  - CGE folks say that it is possible

- **Structural shifts**

- **Hypothetical extraction (fairly well developed)**

- **Hypothetical insertion (not yet formalized)**

- **Some description in Miller and Blair**

- **Analogous to hypothetical extraction**

- **Allow for expansion of existing firms**

- **Explore possible sales distribution**

- **Alternative production function libraries**

- **Economic accounts balancing**