

Integrated Economic-Environmental Modeling for Evidence-Based Public Policy
and Investment Design

Building a Social Accounting Matrix for Chile 2016

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Introduction

- The 2016 Social Accounting Matrix for Chile was built using the National Accounts prepared by the Central Bank of Chile.
 - Supply and Use Tables (COU) (112x181)
 - Integrated Economic Accounts (IEA)
- In this presentation, we will see
 - how the SAM was built
 - some statistics describing Chile's economy as captured in the SAM

Supply and Use Tables

- Use Matrix:
 - consumption of each good at purchaser prices
 - activities (intermediate consumption)
 - institutions (households, government, rest of the world)
 - investment
 - composition of gross value added (GDP at basic prices) by activity
 - compensation of employees
 - net taxes on production and imports
 - gross mixed income
 - gross operating surplus

Supply and Use Tables – cont.

- Supply Matrix
 - production of each good by each activity at basic prices
 - taxes on products (specific taxes, VAT, tariffs, others)
 - trade and transport margins
 - Imports
 - total supply at purchaser prices

Integrated Economic Accounts

- I. Production Account / Foreign Goods and Services Account
- II. 1.1. Income generation account
- II. 1.2. Primary income distribution account
- II. 2. Secondary income distribution account
- II. 3. Income redistribution account in kind
- II. 4. Income utilization account
- III. 1. Capital account

Building Macro SAM Chile 2016

- Integrated Economic Accounts
 - in cases where information is not "bilateralized" - simple assumptions
 - property income
 - social contributions and benefits
 - other current transfers
 - adjustment for changes in pension and non-pension rights
- Supply Table
- Use Table
- Domestic/External Government Borrowing
 - source: Estadísticas de las Finanzas Públicas 2008 – 2017, Dirección de Presupuestos, Ministerio de Hacienda

Steps for Building SAM Chile 2016

- Building Macro SAM
 - national accounts (IEA)
- Building Meso SAM 1
 - macro SAM + SUT to disaggregate activities and commodities (or products)
 - by definition, totals in meso SAM = macro SAM
- Building Meso SAM 2
 - adjustments needed for IEEM; e.g., trade and transport margins, mixed income between labor and capital
 - additional disaggregations; e.g., factors and households

Disaggregation Capital Factor

- The payments to the capital factor are disaggregated in order to single out the rent received by natural resources - agricultural land, forestry, extractive resources (mining), etc.
 - particularly relevant if dynamic model and/or mobile capital between sectors.
- The information was obtained from GTAP - same procedure.

Composition Gross Operating Surplus (Capital Factor) (%) – GTAP

Actividad	Capital	Recurso Natural	Total
Agricultura	47.2	52.8	100.0
Ganadería	47.2	52.8	100.0
Silvicultura	89.2	10.8	100.0
Pesca	46.8	53.2	100.0
Minería	82.7	17.3	100.0

Disaggregation Labor Factor Payments: Discussion

- First, mixed income was split between labor and capital using estimates on the number of wage and non-wage workers by activities
- The payments to wage and non-wage workers were disaggregated, each, into five categories:
 - less than completed primary education
 - complete primary education
 - incomplete secondary education
 - complete secondary education
 - incomplete tertiary education
 - complete tertiary education

Description SAM Chile 2016

- The following tables show indicators derived from the SAM
 - for simplicity, the simulations are performed with a SAM that identifies 28 activities and 28 outputs
 - in addition, we use an aggregated version of the SAM to show in graphs; 13 activities and 13 outputs
- As we will see, this information is useful when interpreting IEEM results.

Accounts SAM Chile 2016

Actividad	Producto	Descripción
a-crops	c-crops	crops
a-livestock	c-livestock	livestock
a-for	c-for	forestry
a-fishing	c-fishing	fishing
a-petgas	c-petgas	oil and natural gas
a-copper	c-copper	copper
a-othmin	c-otrmin	other mining
a-food	c-food	food
a-tex	c-tex	textiles and wearing apparel
a-wood	c-wood	wood
a-paper	c-paper	paper
a-prodpet	c-prodpet	refined pet products
a-chem	c-chem	chemicals
a-cauchoplast	c-cauchoplast	rubber and plastic
a-prodminmet	c-prodminmet	non-metallic mineral prod
a-met	c-met	metals
a-maq	c-maq	machinery and equipment
a-vehic	c-vehic	vehicles
a-othmnfc	c-othmnfc	other manufact
a-ele	c-ele	electricity
a-gas	c-gas	gas
a-wat	c-wat	water
a-cns	c-cns	construction
a-trd	c-trd	trade
a-hotelrest	c-hotelrest	hoteles and restaurants
a-trns	c-trns	transport
a-admpub	c-admpub	public administration
a-eduhealth	c-eduhealth	education and health
a-othsvc	c-othsvc	other serv

Macro Indicators from SAM (gdpindic00)

	Nominal	GDPshr
Item	miles mill \$	%
Absorption	168,704.3	99.55
PrvCon	107,417.2	63.38
GovCon	23,361.9	13.79
FixInv	38,625.2	22.79
PrvFixInv	34,636.0	20.44
GovFixInv	3,989.1	2.35
StockChange	-700.1	-0.41
Exports	45,495.4	26.85
Imports	44,730.2	26.39
GDPMP	169,469.5	100.00
NetIndTax	18,421.3	10.87
GDPFC	151,048.2	89.13

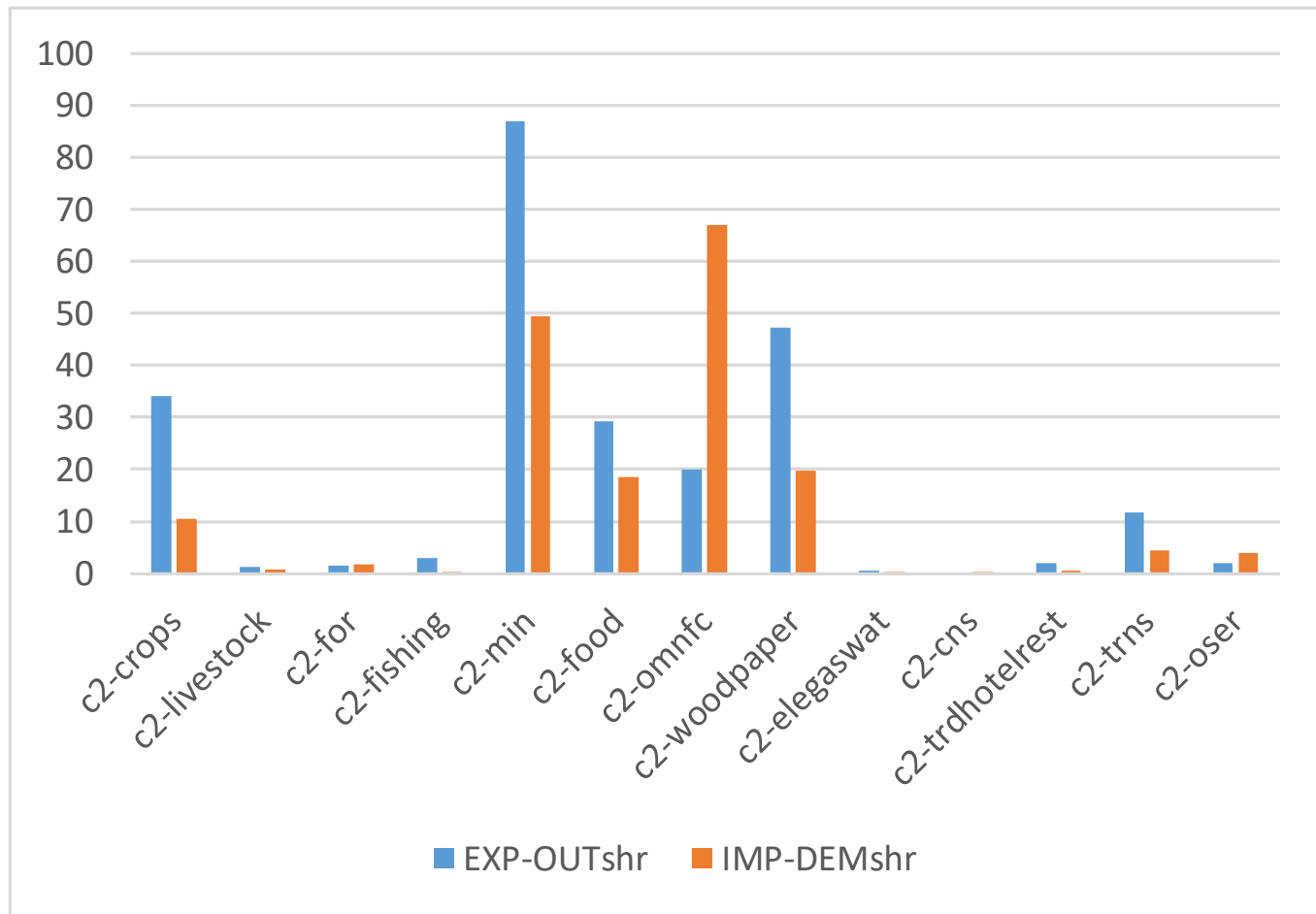
Balance of Payments; Inflows and Outflows of Foreign Exchange (bopindic00)

	Nominal	GDPshr
Item	miles mill \$	%
InCur-Exports	45495.4	26.85
InCur-Trnsfr-NoGov	953.9	0.56
InCur-FacInc	43.7	0.03
InCur-RowSav	2879.6	1.70
InCur-Total	49372.6	29.13
OutCur-Imports	44730.2	26.39
OutCur-Trnsfr-NoGov	4334.9	2.56
OutCur-Trnsfr-Gov	73.8	0.04
OutCur-FacInc	233.8	0.14
OutCur-Total	49372.6	29.13
InCap-NetForFin-NoGov	2384.3	1.41
InCap-NetForFin-Gov	495.3	0.29
InCap-NetForFin-Total	2879.6	1.70

Government Revenues and Expenditures (fiscalindic00)

	Nominal	GDPshr
Item	miles mill \$	%
IncCur-DirTax	10487.0	6.19
IncCur-ActTax	1788.2	1.06
IncCur-ComTax	15937.6	9.40
IncCur-ImpTax	695.5	0.41
IncCur-TrnsfrDom	3168.7	1.87
IncCur-FacInc	1984.4	1.17
IncCur-Total	34061.4	20.10
SpndCur-Con	23361.9	13.79
SpndCur-TrnsfrDom	8596.0	5.07
SpndCur-TrnsfrFor	73.8	0.04
SpndCur-Total	32031.7	18.90
GovSav	2029.8	1.20
SpndCap-FixInv	3989.1	2.35
SpndCap-StockChange	-8.3	0.00
GovSurp	-1951.1	-1.15
IncCap-NetDomFin	1455.7	0.86
IncCap-NetForFin	495.3	0.29
Inc-Total	36012.5	21.25
Spnd-Total	36012.5	21.25

Sectoral Structure in SAM (%) (sectorstruc00) – cont.

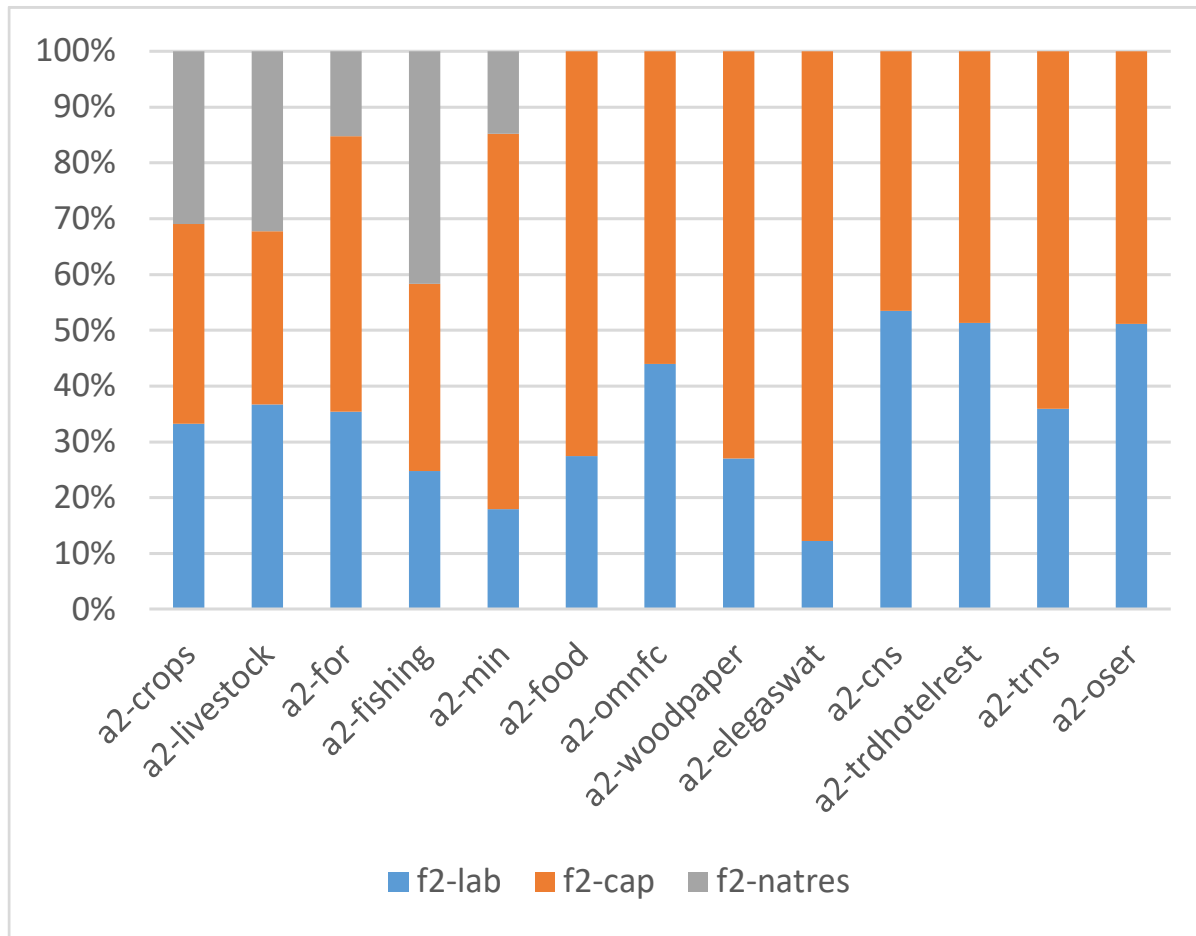


Sectoral Structure in SAM (%)

(sectorstruc00) – cont.

	VAshr	PRDshr	EMPshr	EXPshr	EXP- OUTshr	IMPshr	IMP- DEMshr
c-crops	2.78	2.48	5.90	8.52	34.03	1.40	10.42
c-livestock	0.62	0.97	1.44	0.09	1.26	0.04	0.66
c-for	0.37	0.42	0.84	0.05	1.42	0.04	1.64
c-fishing	0.60	0.95	0.92	0.18	2.84	0.02	0.29
c-copper	7.40	7.01	1.42	41.51	92.45	0.28	7.62
c-otrmin	1.23	1.17	0.29	4.10	54.62	6.39	65.20
c-food	4.53	7.28	3.40	14.89	29.27	7.40	18.43
c-tex	0.22	0.40	0.36	1.09	26.61	7.80	81.41
c-wood	0.60	0.94	0.42	3.41	50.49	0.47	14.30
c-paper	0.91	1.49	0.64	4.35	45.06	1.57	22.65
c-prodpet	0.37	0.93	0.16	0.53	7.07	5.55	52.13
c-chem	1.17	1.89	0.96	4.60	34.32	9.77	53.84
c-cauchoplast	0.36	0.63	0.47	0.97	19.74	3.06	49.72
c-prodminmet	0.37	0.77	0.37	0.12	2.17	1.37	23.23
c-met	0.83	1.22	0.95	1.49	17.21	4.92	43.11
c-maq	0.49	0.62	0.58	1.42	27.43	24.22	89.03
c-vehic	0.11	0.17	0.18	0.68	44.22	11.97	93.88
c-othmnfc	0.54	0.58	0.81	0.43	5.04	1.94	48.31
c-ele	2.48	3.32	0.52	0.02	0.08	0.00	0.00
c-gas	0.19	0.42	0.04	0.13	4.79	0.00	0.00
c-wat	0.48	0.40	0.51	0.00	0.00	0.00	0.00
c-cns	7.43	8.59	8.81	0.00	0.00	0.00	0.00
c-trd	9.73	10.28	17.97	1.54	2.34	0.27	0.41
c-hotelrest	2.28	2.37	4.91	0.02	0.16	0.15	0.94
c-trns	6.09	6.32	6.27	4.78	11.83	1.63	4.30
c-admpub	5.01	3.69	4.59	0.00	0.00	0.00	0.00
c-eduhealth	10.38	7.66	12.77	0.00	0.00	0.00	0.00
c-othsvc	32.42	27.03	23.50	5.09	2.94	9.74	5.41
total	100.00	100.00	100.00	100.00	14.54	100.00	18.02

Sectoral VA Composition (%) (facdemstruc00)

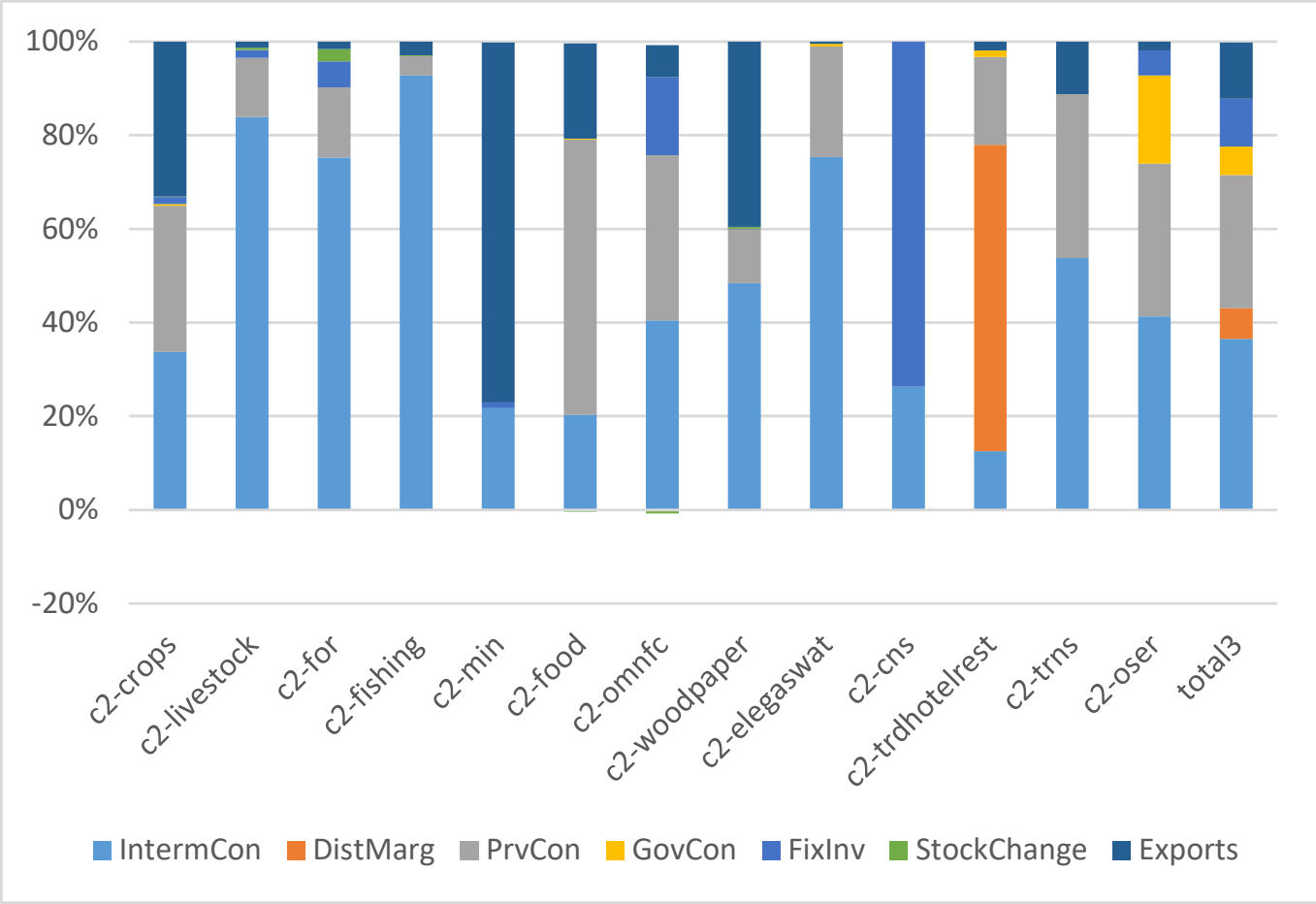


Sectoral VA Composition (%)

(facdemstruc00) – cont.

	f-lab	f-cap	f-natres	total
a-crops	33.24	35.79	30.98	100.00
a-livestock	36.70	31.09	32.21	100.00
a-for	35.39	49.38	15.23	100.00
a-fishing	24.80	33.57	41.63	100.00
a-copper	17.47	67.62	14.91	100.00
a-othmin	21.38	64.68	13.94	100.00
a-food	27.42	72.58	0.00	100.00
a-tex	65.87	34.13	0.00	100.00
a-wood	27.48	72.52	0.00	100.00
a-paper	26.77	73.23	0.00	100.00
a-prodpet	17.49	82.51	0.00	100.00
a-chem	38.82	61.18	0.00	100.00
a-cauchoplas	52.41	47.59	0.00	100.00
a-prodminnr	39.60	60.40	0.00	100.00
a-met	45.50	54.50	0.00	100.00
a-maq	47.08	52.92	0.00	100.00
a-vehic	62.62	37.38	0.00	100.00
a-othmnfc	47.82	52.18	0.00	100.00
a-ele	10.96	89.04	0.00	100.00
a-gas	13.20	86.80	0.00	100.00
a-wat	18.25	81.75	0.00	100.00
a-cns	53.45	46.55	0.00	100.00
a-trd	51.37	48.63	0.00	100.00
a-hotelrest	50.98	49.02	0.00	100.00
a-trns	35.93	64.07	0.00	100.00
a-admpub	79.11	20.89	0.00	100.00
a-eduhealth	79.40	20.60	0.00	100.00
a-othsvc	35.92	64.08	0.00	100.00
total	43.58	53.75	2.66	100.00

Sectoral Demand Composition (%) (demstruc00)

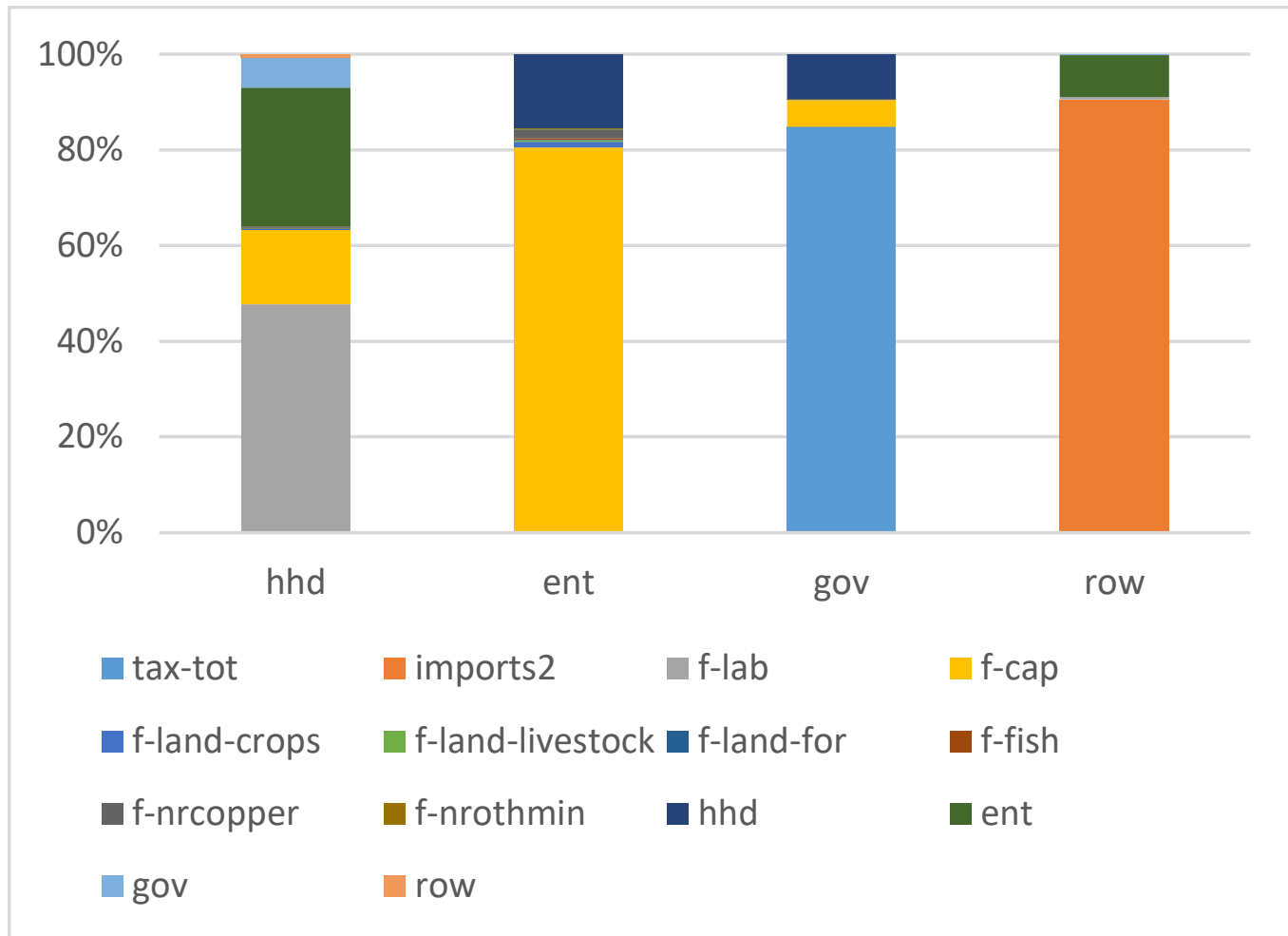


Sectoral Demand Composition (%)

(demstruc00) – cont.

	IntermCon	DistMarg	PrvCon	GovCon	FixInv	StockChange	Exports	TotDem
c-crops	33.74	0.00	31.16	0.36	1.58	0.00	33.15	100.00
c-livestock	83.85	0.00	12.66	0.00	1.71	0.45	1.33	100.00
c-for	75.21	0.00	15.02	0.00	5.57	2.63	1.58	100.00
c-fishing	92.76	0.00	4.10	0.00	0.00	0.24	2.89	100.00
c-copper	8.29	0.00	0.00	0.00	0.00	-0.15	91.85	100.00
c-otrmin	65.50	0.00	0.00	0.00	5.42	-0.36	29.44	100.00
c-food	20.46	0.00	59.23	0.18	0.00	-0.41	20.54	100.00
c-tex	12.57	0.00	82.89	0.00	0.15	-1.23	5.62	100.00
c-wood	49.82	0.00	2.02	0.00	0.36	1.66	46.15	100.00
c-paper	47.51	0.00	17.03	0.22	0.00	-0.39	35.62	100.00
c-prodpet	58.49	0.00	37.34	0.00	0.00	1.27	2.90	100.00
c-chem	53.16	0.00	31.51	0.00	0.00	0.30	15.02	100.00
c-cauchoplast	65.67	0.00	18.12	0.00	6.26	-1.47	11.43	100.00
c-prodminmet	90.10	0.00	7.72	0.00	0.00	0.46	1.71	100.00
c-met	71.64	0.00	6.95	0.00	12.74	-1.74	10.41	100.00
c-maq	26.15	0.00	24.33	0.28	45.95	-0.43	3.72	100.00
c-vehic	15.80	0.00	43.38	0.00	41.65	-4.70	3.86	100.00
c-othmnfc	28.79	0.00	63.37	0.00	4.16	-0.77	4.45	100.00
c-ele	81.04	0.00	18.88	0.00	0.00	0.00	0.07	100.00
c-gas	78.07	0.00	17.28	0.00	0.00	0.00	4.64	100.00
c-wat	29.59	0.00	65.21	5.19	0.00	0.00	0.00	100.00
c-cns	26.29	0.00	0.00	0.00	73.71	0.00	0.00	100.00
c-trd	12.03	82.49	3.17	0.00	0.00	0.00	2.31	100.00
c-hotelrest	14.36	0.00	78.51	6.99	0.00	0.00	0.14	100.00
c-trns	53.78	0.00	34.92	0.00	0.00	0.00	11.30	100.00
c-admpub	0.86	0.00	1.15	97.99	0.00	0.00	0.00	100.00
c-eduhealth	3.96	0.00	45.62	50.42	0.00	0.00	0.00	100.00
c-othsvc	56.32	0.00	33.05	0.58	7.36	0.00	2.70	100.00
total	36.66	6.60	28.45	6.19	10.23	-0.19	12.05	100.00

Structure Income of Institutions (%) (incomestruc00)



Structure Income of Institutions (%)

(incomestruc00) – cont.

Item	hhd	ent	gov	row
tax-tot	0.00	0.00	84.87	0.00
imports2	0.00	0.00	0.00	90.60
f-lab	47.72	0.00	0.00	0.47
f-cap	15.55	80.49	5.55	0.00
f-land-crops	0.23	1.21	0.08	0.00
f-land-livestc	0.06	0.30	0.02	0.00
f-land-for	0.02	0.13	0.01	0.00
f-fish	0.07	0.36	0.02	0.00
f-nrcopper	0.34	1.77	0.12	0.00
f-nrothmin	0.04	0.23	0.02	0.00
hhd	0.00	15.53	9.30	0.00
ent	29.02	0.00	0.00	8.78
gov	6.25	0.00	0.00	0.15
row	0.69	0.00	0.00	0.00
total	100.00	100.00	100.00	100.00

Other Data Besides SAM

- Moreover, to calibrate IEEM
 - CO2 emissions by activity
 - water use by activity
 - land use (e.g., hectares)
 - number of workers by activity
 - labor underutilization rates
 - initial stocks of capital and debt
 - elasticities of production, consumption, trade, factor (land) movements across sectors
 - MP capital in infrastructure