Methods and experiences of IO table construction under the IE Lab

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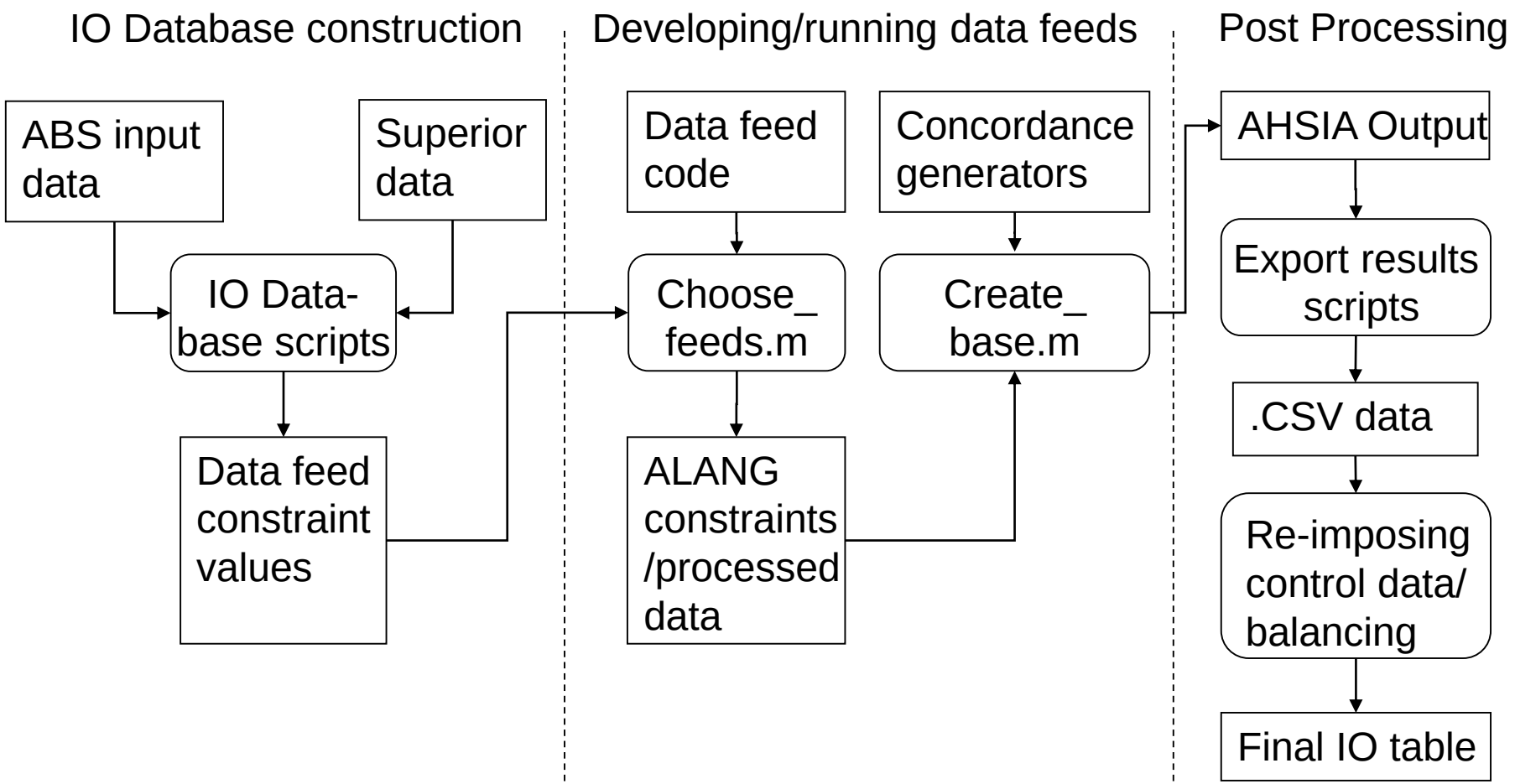
Introduction

- EconSearch has been involved in IE lab since January 2014.
- General steps in producing IO tables
  - Database Construction
  - Developing/running data feeds
  - Post processing
- Specific example of IE lab's use

IO table production flow chart

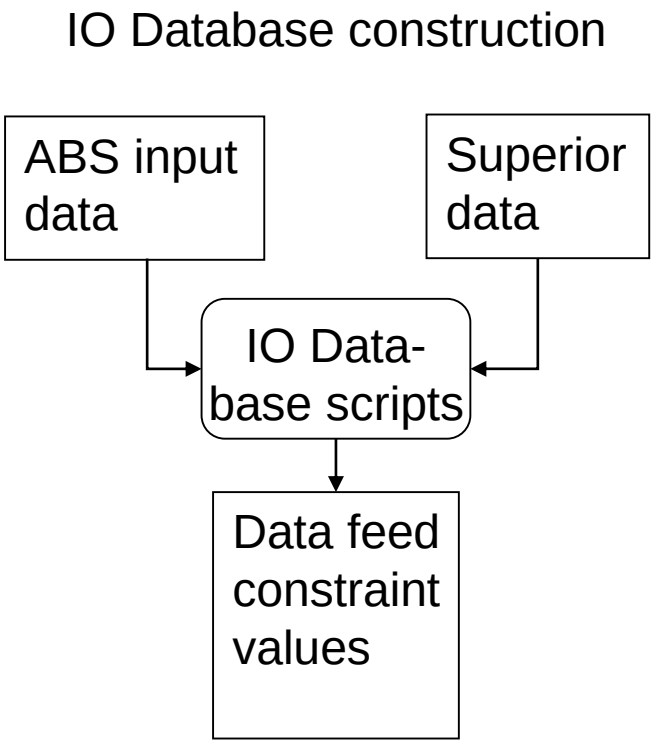


IO Database construction

- Still require estimation of control data
  - We estimate VA, FD and total outputs.
  - Estimates based on ABS publications, supplemented with superior data (e.g. fisheries and wine grape production data).
- Most of database construction has been redeveloped to function in MATLAB/Octave
  - Streamlined IO database construction
  - Less laborious accepting data inputs

IO Database construction (cont.)

- Visually we are at the following segment from the flow chart



Data feed construction

- A-LANG commands used to link IO database values to the root classification
- For each data feed there is a MATLAB script which is run via Choose_feeds.m program
- The EconSearch data feeds fix VA, FD and Total Output to the root classification.
- Concordance generating scripts developed

Data feed constraints – NSW example

- The VA and FD A-LANG constraints are as follows

Constraint	Incl	#	Parts	Value	Pre-Map	Post-Map	S.E.	Pre-Map	Post-Map	Coef1
VA data for New South Wales 2013	Y	1	1	DATAPATH/NSW_VA.csv			E MX0.01; MN1;			1
FD data for New South Wales 2013	Y	2	1	DATAPATH/NSW_FD.csv			E MX0.01; MN1;			1

Years	Margin	Parent of Origin	Child or Origin	Grandchild of Origin	Parent of Destination	Child of Destination	Grandchild of Destination
14	1	NSWSum	3	1:e	NSWSum	1	1:e a CONCPAT
14	1	NSWSum	2	1:e a CONCPA	NSWSum	3	1:e

- The constraints loop through the highlighted sectors on the root classification

					NSW		
				Parent of Destination	[1:538;540]		
				Child of Destination	1	2	3
				Grandchild of Destination	1:1284	1:1284	1:6
Parent of Origin		Child of Origin	Grand-child of Origin	Type	Ind	Com	FD
NSW	[1:538;540]	1	1:1284	Ind			
		2	1:1284	Com			
		3	1:5	PI			*)

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Data feed constraints – NSW example (cont.)

- The industrial output constraints are as follows

Constraint	Incl	#	Parts	Value	Pre-Map	Post-Map	S.E.
Output (industies - transactions) data	Y	3	1	DATAPATH/Output_ind_trans_NSW.csv			E MX0.01; MN1;
Output (commodities - transactions) data	Y	4	1	DATAPATH/Output_com_trans_NSW.csv			E MX0.01; MN1;
Output (industries - supply) data	Y	5	1	DATAPATH/Output_ind_supply_NSW.csv			E MX0.01; MN1;
Output (commodities - supply) data	Y	6	1	DATAPATH/Output_com_supply_NSW.csv			E MX0.01; MN1;

Pre-Map	Post-Map	Coef1	Years	Margin	Parent of Origin	Child or Origin	Grandchild of Origin	Parent of Destination	Child of Destination	Grandchild of Destination
		1	14	1	1-e	1-e	1-e	NSWSum	1	1:e a CONCPAT
		1	14	1	NSWSum	2	1:e a CONCPA	1-e	1-e	1-e
		1	14	1	NSWSum	1	1:e a CONCPA	NSWSum	2	1-e
		1	14	1	NSWSum	1	1-e	NSWSum	2	1

Data feed constraints – NSW example (cont.)

- Visually we have the following root classification
- The constraints sum over the highlighted sectors

					NSW			Vic			...	OT			RoW		
				Parent of Destination	[1:538;540]			[541:973;975]			...	[539;974;1502;1674;19			2215		
				Child of Destination	1	2	3	1	2	3	...	1	2	3	1	2	3
				Grandchild of Destination	1:1284	1:1284	1:6	1:1284	1:1284	1:6	...	1:1284	1:1284	1:6	1	0	0
	Parent of Origin	Child of Origin	Grand-child of Origin	Type	Ind	Com	FD	Ind	Com	FD	...	Ind	Com	FD	Ind	Com	FD
NSW	[1:538;540]	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI			*)				...						
Vic	[541:973;975]	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI						*)	...						
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
OT	[539;974;1502;1	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI							...			*)			
RoW	2215	1	0	Ind							...						
		2	1:1284	Com							...						
		3	0	PI							...						
Q	**)	**)	1:1284	Sat							...						

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Running data feed

- Run Create_base.m to execute AISHA
- Initially only concerned with producing data feeds for SA
- However we felt the results could be improved
  - I.e. results better aligned to the constraints.
- Experimented with different AISHA runs
  - Included RoA data constraints/regional aggregators
  - Developed data feeds for all States and Territories

IO table production flow chart

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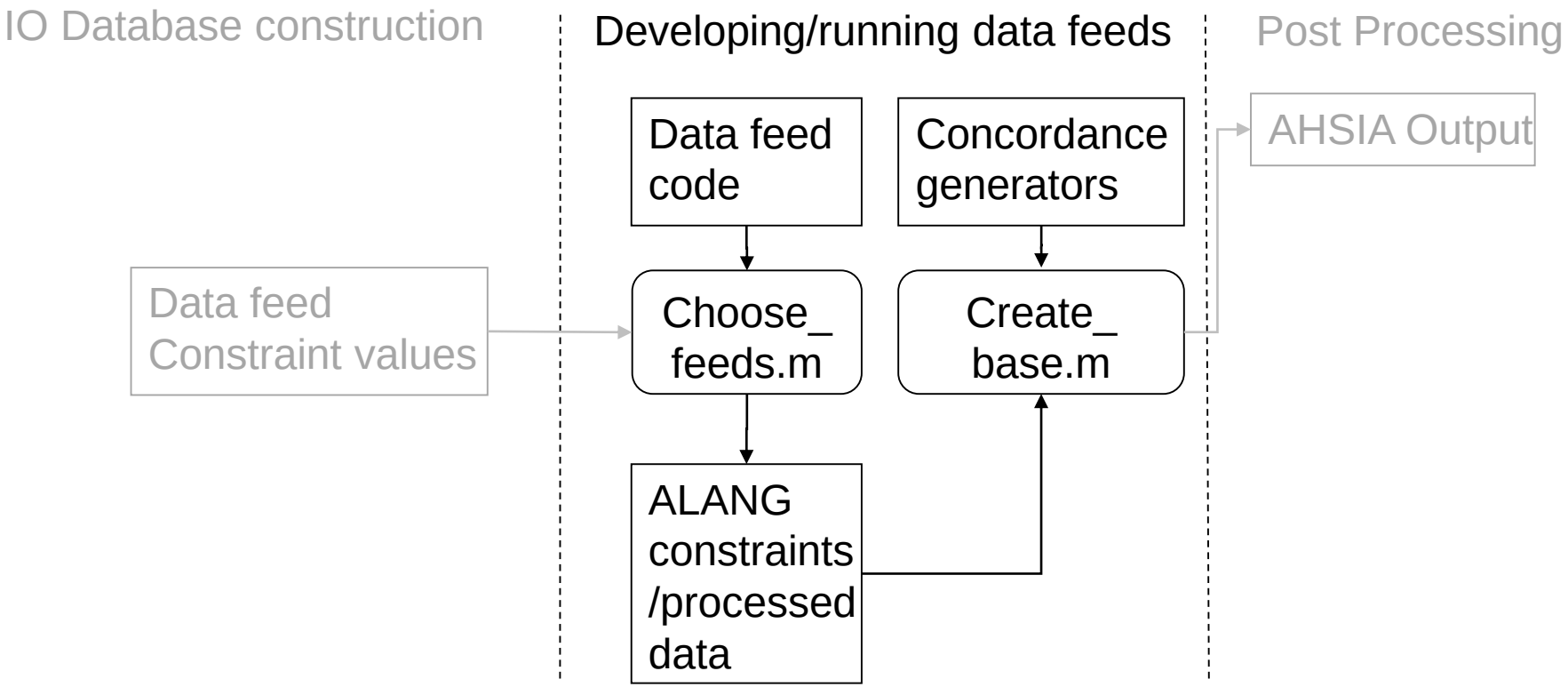

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Post processing

- Reading/converting from .sbin
- Require different structure to the data, needs to be
  - Only one region transaction table
  - Industry by Industry transaction flows
  - Exports / Imports as one broad sector
- Developed a script to extract the appropriate data

Post processing – NSW example

- Post processing is interested in the highlighted results

					NSW			Vic			...	OT			RoW		
				Parent of Destination	[1:538;540]			[541:973;975]			...	[539;974;1502;1674;19			2215		
				Child of Destination	1	2	3	1	2	3	...	1	2	3	1	2	3
				Grandchild of Destination	1:1284	1:1284	1:6	1:1284	1:1284	1:6	...	1:1284	1:1284	1:6	1	0	0
	Parent of Origin	Child of Origin	Grand-child of Origin	Type	Ind	Com	FD	Ind	Com	FD	...	Ind	Com	FD	Ind	Com	FD
NSW	[1:538;540]	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI			*)				...						
Vic	[541:973;975]	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI						*)	...						
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
OT	[539;974;1502;1	1	1:1284	Ind							...						
		2	1:1284	Com							...						
		3	1:5	PI							...			*)			
RoW	2215	1	0	Ind							...						
		2	1:1284	Com							...						
		3	0	PI							...						
Q	**)	**)	1:1284	Sat							...						

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Post processing - Issues

- Converting commodities to industries still in development
- Pros/cons of conflict resolution used by AISHA.
  - Allows collaboration
  - Results may vary from their set values
- Must perform adjustments outside the cloud
  - Re-imposing constraints
  - Rebalancing
  - RAS-ing transactions table (to IO database output values)

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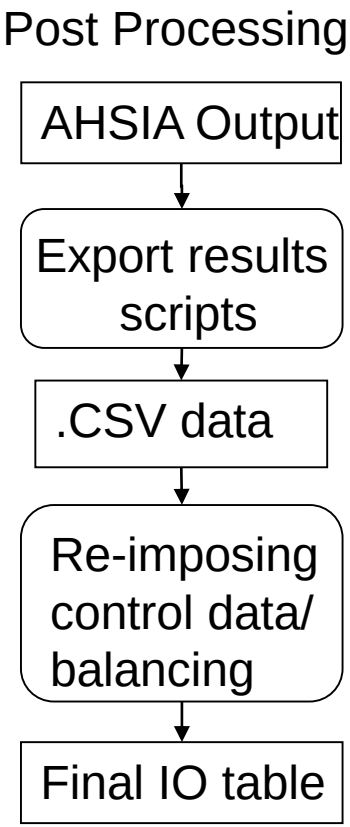

Example – Eyre Peninsula (EP) economic profile

- Commissioned to constructed economic profiles for the Eyre Peninsula State Government Region + LGAs
  - Economic profiles require the regional IO tables
- Generally we require economic data based on LGA zones
  - LGAs better correspond to economic activity; and
  - provide appropriate boundaries for stakeholders, such as Local and/or State government

Example – EP economic profiles: IO database issues

- Confidentiality issues with table builder data
  - ABS incorporates randomness into data
  - Data does not necessary line up to whole of region
  - Regional data reconciled to the whole region
- Estimates are more sensitive at the regional level
  - Increased sophistication of database construction
- Prior to these fixes had some odd estimates
  - e.g. fishing in land locked LGAs, no wine grape production in LGA with vineyards, etc.

Example – EP economic profiles: Data feed setup/running issues

- LGA regions do not align neatly with the IE labs' SA2 structure.
  - We can broadly allocate the SA2 regions to the LGAs, but some SA2s belongs to many of the LGAs.
- Have to run table optimisation separately for each LGA
  - Different regional aggregator concordance for each LGA run (LGA, the Rest of State and the remaining States & Territories)
  - Using each State & Territory's data feed, and the LGA specific data feed.

Example – EP economic profiles: Finalising models

- Following successful IO table optimisation, we perform post processing as previously discussed.
- The balanced table is then inserted into our economic model which we use to produce economic profiles for LGA regions.

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