The GVAR Toolbox: Installing Necessary Files, Basics of Data Input and Manipulation

Samson M'boueke

University of Notre Dame

January 8, 2024

Installing the Files

- The GVAR program works under Microsoft Windows. It features an interface based on Microsoft Excel, and it relies on a set of MATLAB routines for execution.

- Download the **GVAR_Toolbox2.0_August2014.zip** file here and unzip it in your working directory.

- See the GVAR User Guide for a description of the files and subfolders in the **GVAR_Toolbox2.0** folder.

- We will be using mostly two files for the GVAR analysis:
  - (1) **gvar.m:** the MATLAB script file which contains all the functions needed for the analysis.
  - (2) the Excel file containing the data and a number of predefined settings and specifications. We will use **gvarFullDemo.xls** for session.

- **Labelling Rules:** There is a set of conventions for the labels entered in the **gvarFullDemo.xls** interface. These are summarized as follows:

Field Name	Format	Example	Notes
country name region name variable name	upper case	CANADA EURO INFLATION	can contain spaces but must not start with a number or contain symbols
country short name region short name variable short name	lower case	can euro[a] dp[b]	must not contain spaces, symbols or numbers
country code	integer only	112	
dates	yyyyMmm yyyyQq yyyy	2001M11 2001Q4 2001	for monthly data for quarterly data for annual data

Notes: [a]The country name and country short name can be the same, as long as they are in upper case and lower case, respectively. [b]The variable short names could also be in upper case format, for example DP, or in a combination of upper and lower case, for example Dp, however lower case is recommended.

Rules and Limitations

- **Size limitations:** The table below summarizes the maximum number of individual models, as well as the maximum number of domestic, foreign and global variables, permitted in the current version of the program.

	Max. no. can input into the interface file	Max. no. can use in the modelling stage
Individual models	N-1[c]	N-1
Country-specific variables	20[d]	any 12 domestic[e,g] any 8 weakly exogenous[f,g]
Global variables	10[d]	Subject to the above constraints on domestic and weakly exogenous variables

Rules and Limitations

- [c] N denotes the number of columns per worksheet permitted by your version of Excel. In each worksheet for the variables, one column is required for the date field. Thus, you can only have up to $N - 1$ individuals models

- [d] These are capped based on the design of the interface file

- [e] This includes any global variable(s) treated as domestic

- [f] This includes all foreign-specific and any global variable(s) treated as weakly exogenous

- [g] The critical values provided for the cointegration tests only cover a matrix of 12 domestic by 8 weakly exogenous variables

Initial Inputs and Data

Defining the countries, regions and variables

- Open **gvarFullDemo.xls** (This is a demo file that already contains the data and a number of predefined settings and specfications).

- Go to the **MAIN** interface worksheet.

- In the **GVAR SETUP** section, the columns **Countries**, **Regions**, and **Variables** show how the country, region, and variable names should be entered.

Initial Inputs and Data

Countries

Name	Short name	Code
ARGENTINA	arg	213
AUSTRALIA	austlia	193
AUSTRIA	austria	122
BELGIUM	bel	124
BRAZIL	bra	223
CANADA	can	156
CHINA	china	160
CHILE	chl	228
FINLAND	fin	172
FRANCE	france	132
GERMANY	germ	134
INDIA	india	534
INDONESIA	indns	536
ITALY	italy	136
JAPAN	japan	158
KOREA	kor	542
MALAYSIA	mal	548
MEXICO	mex	273
NETHERLANDS	neth	138
NORWAY	nor	142
NEW ZEALAND	nzld	196
PERU	per	293
PHILIPPINES	phlp	566
SOUTH AFRICA	safrc	199
SAUDI ARABIA	sarbia	456
SINGAPORE	sing	576
SPAIN	spain	184
SWEDEN	swe	144
SWITZERLAND	switz	146
THAILAND	thai	578

Regions

Name	Short name	Countries included
EURO	euro	austria
		bel
		fin
		france
		germ
		italy
		neth
		spain

Variables

Country-specific variables

Name	Short name	Associated weight matrix
REAL GDP	y	wmat1
INFLATION	Dp	wmat1
REAL EQUITY PRICES	eq	wmat1
REAL EXCHANGE RATE	ep	wmat1
NOMINAL S RATE	r	wmat1
NOMINAL L RATE	lr	wmat1

Global Variables

Name	Short name
OIL PRICE	poil
RAW MATERIAL PRICE	pmat
METAL PRICE	pmetal

MAIN | DOMINANT UNIT | wmat1 | wmat2 | wmat3 | weights_aggr | y | Dp | eq | ep | r | lr | poil | pmat | pmetal | +

Initial Inputs and Data

Importing the data

- Each variable (country-specific and global) defined in the **Variables** column in the **GVAR SETUP** section corresponds to a specific worksheet with the exact same **short name**

- This is where the data for that specific variable should go. In this demo, the concerned worksheets are **y**, **Dp**, **eq**, **ep**, **r**, **lr**.

- The next two images show how the data should be entered for the country-specific variable **y** and the global variable **poil**.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	date	arg	austlia	austria	bel	bra	can	china	chl	fin	france	germ	india
2	1979Q2	4.29468	3.90007	4.10021	4.14005	4.0989	4.01651	2.70393	3.59052	4.06045	4.17007	4.19243	3.43872
3	1979Q3	4.31001	3.91252	4.11174	4.16058	4.15047	4.02345	2.73302	3.62154	4.05901	4.17517	4.18985	3.44907
4	1979Q4	4.32535	3.93341	4.12481	4.1811	4.20204	4.02957	2.7621	3.65256	4.07592	4.17813	4.1956	3.45942
5	1980Q1	4.34068	3.93324	4.13533	4.20162	4.2536	4.03872	2.77489	3.68358	4.10981	4.18837	4.20545	3.46977
6	1980Q2	4.32474	3.93485	4.12344	4.19875	4.22731	4.03654	2.78768	3.68392	4.09256	4.18411	4.196	3.49502
7	1980Q3	4.30881	3.94488	4.13034	4.18445	4.20101	4.03619	2.80046	3.70897	4.13343	4.18537	4.18885	3.52027
8	1980Q4	4.29287	3.95973	4.13087	4.17986	4.17471	4.04736	2.81325	3.79289	4.11399	4.18679	4.18626	3.54553
9	1981Q1	4.27693	3.96177	4.1237	4.17769	4.14841	4.07203	2.82575	3.76597	4.1229	4.18862	4.19699	3.57078
10	1981Q2	4.26639	3.97879	4.13226	4.19442	4.16359	4.08131	2.83825	3.77339	4.12821	4.19343	4.19659	3.57115
11	1981Q3	4.25585	3.9967	4.13266	4.18935	4.17878	4.07425	2.85076	3.80205	4.13695	4.20245	4.19679	3.57153
12	1981Q4	4.2453	3.99652	4.12647	4.19173	4.19396	4.06913	2.86326	3.74671	4.14381	4.2131	4.19164	3.5719
13	1982Q1	4.23476	3.98521	4.14667	4.19533	4.20915	4.05923	2.89044	3.67948	4.14429	4.21619	4.19382	3.57227
14	1982Q2	4.23097	3.99158	4.14874	4.19766	4.18919	4.04941	2.91763	3.63286	4.15562	4.22544	4.19044	3.59616
15	1982Q3	4.22719	3.98576	4.14829	4.19382	4.16924	4.04059	2.94481	3.59376	4.17078	4.22445	4.17743	3.62004
16	1982Q4	4.2234	3.96923	4.14729	4.19034	4.14929	4.03128	2.97199	3.57224	4.18519	4.22997	4.17823	3.64393
17	1983Q1	4.21961	3.9586	4.15828	4.18867	4.12933	4.0466	2.99707	3.5942	4.17844	4.23187	4.19223	3.66781
18	1983Q2	4.25235	3.95779	4.17111	4.19139	4.14285	4.06926	3.02215	3.60808	4.19064	4.23674	4.20074	3.67597
19	1983Q3	4.28508	3.98625	4.17929	4.19688	4.15636	4.0798	3.04723	3.61725	4.20308	4.23989	4.19916	3.68413
20	1983Q4	4.31782	4.00629	4.19026	4.21242	4.16988	4.09181	3.07231	3.63364	4.19632	4.24283	4.21676	3.69229
21	1984Q1	4.35055	4.02939	4.17667	4.21668	4.18339	4.10921	3.11558	3.65143	4.21854	4.24913	4.22832	3.70045
22	1984Q2	4.30892	4.03392	4.16981	4.21857	4.2019	4.12638	3.15886	3.68489	4.21854	4.24769	4.21248	3.71092
23	1984Q3	4.26728	4.04214	4.17857	4.22242	4.22041	4.13064	3.20213	3.68794	4.22618	4.25252	4.23728	3.72139

MAIN	DOMINANT UNIT	wmat1	wmat2	wmat3	weights_aggr	y	Dp	eq	ep

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	date	Oil Price												
2	1979Q2	3.43354												
3	1979Q3	3.57632												
4	1979Q4	3.69673												
5	1980Q1	3.66166												
6	1980Q2	3.64335												
7	1980Q3	3.55005												
8	1980Q4	3.67934												
9	1981Q1	3.6669												
10	1981Q2	3.56132												
11	1981Q3	3.57197												
12	1981Q4	3.60504												
13	1982Q1	3.47438												
14	1982Q2	3.53543												
15	1982Q3	3.51432												
16	1982Q4	3.51195												
17	1983Q1	3.38075												
18	1983Q2	3.39576												
19	1983Q3	3.42658												
20	1983Q4	3.37218												
21	1984Q1	3.39307												
22	1984Q2	3.38714												
23	1984Q3	3.33511												

‹ › ⋯ | DOMINANT UNIT | wmat1 | wmat2 | wmat3 | weights_aggr | y | Dp | eq | ep | r | lr | **poil**

Initial Inputs and Data

- Defining regions is optional, but if you opt for creating one as in the **Regions** column of the **GVAR SETUP** section, you need a set of aggregation weights

- In this demo, PPP GDP data are being used to construct the weights for aggregating the Euro Area country variables into regional ones.

- The PPP GDP data go into the **weights_aggr** worksheet as below:

Initial Inputs and Data

Initial Inputs and Data

- Next, we need to define the weight matrix for constructing the foreign-specific variables. This demo uses trade weights

- There are a few options for defining the trade weight matrix, each allowing for both fixed and time-varying weights. Those include:
    - (1) using the program-built weight matrix option with the **flows.xls** database and no other weight matrices,
    - (2) using the program-built weight matrix option but providing your own cross-country flows data,
    - (3) constructing your own weight matrix and importing it from outside the program

- See the GVAR User Guide for more details on options available. For this session, we will use the first option.

Initial Inputs and Data

- All we need is to make sure the **flows.xls** file is in the **Flows** folder with that exact name, and leave the associated weight matrix worksheet blank (the **wmat1** worksheet in this case)

- The GVAR program will use this file to construct the trade weights. We will later specify whether we want fixed or time-varying weights

- The image below shows how the **flows.xls** file should be structured using the country codes (as defined in the **Countries** column of the **GVAR SETUP** section) to identify countries.

Initial Inputs and Data

	A	B	C	D	E	F	G	H	I	J	K	L
1			110	112	122	124	132	134	136	138	142	144
2	1980	110	NaN	11483.7	427.15	4030.248	6517	11608.4	5099.4	5360.75	1797.65	1739.25
3	1981	110	NaN	12877.35	442.05	3800.399	6739.8	11097.1	5454.5	5557.25	1725.35	1820.4
4	1982	110	NaN	12092.9	442.85	3594.915	6462.65	10897.05	5136	5627.75	1498.5	1890.7
5	1983	110	NaN	11760.6	419.25	3514.889	6134.5	10983.05	4863.5	5458.15	1122.5	2065.05
6	1984	110	NaN	13626.95	567.2	3993.606	7276.55	13447	6439.45	5941.85	1431.6	2484.3
7	1985	110	NaN	13422.9	665.25	3945.386	8027.55	15140.4	7503	5818.65	957.25	3131.9
8	1986	110	NaN	13725.5	687.65	4459.49	8900.95	18344.35	8074.95	6105.2	1053.8	3253.75
9	1987	110	NaN	16055.7	763.85	4905.192	9559.9	19888	8613.95	6226.25	1178.1	3437.35
10	1988	110	NaN	18491.7	938.8	5623.571	11441.8	20824.65	9490.5	7472.85	1244.55	3958.3
11	1989	110	NaN	19873.3	1028.603	6237.384	12550.85	21277.65	9965.855	8235.145	1577.68	4181.085
12	1990	110	NaN	22207.8	1123.4	7075.952	13622.95	23916.2	10691.3	9136.8	1622.3	4257.9
13	1991	110	NaN	20557	1192.8	6924.269	14591.3	24150.8	10459.9	9297.75	1600.15	3972.8
14	1992	110	NaN	21751	1305.1	6928.5	14921.55	25416	10770.6	9636.15	1671.85	3860.55
15	1993	110	NaN	24384.05	1396.45	7361.136	14483.25	24209.25	10144.7	9281.1	1614.55	3521.85
16	1994	110	NaN	26345.4	1595.1	8385.95	15523.95	25963.6	11318.8	9974.7	1884.8	3881.55
17	1995	110	NaN	28268.25	2028.35	8980.266	16009.8	30209.4	13086.45	11664	2272.7	4772.2
18	1996	110	NaN	30307.9	2145.2	9276.425	16813.65	31731.65	13896.45	11813.15	2808.25	5402.05
19	1997	110	NaN	34995.25	2263.05	10773.9	18963.85	34329.75	14583.3	13752.25	2823.05	5424
20	1998	110	NaN	37395.55	2579.25	11278.55	21408.4	38962.55	15475.7	13506.55	2374.1	5947.45
21	1999	110	NaN	39161.7	2635.75	10971.35	22748.9	41408.3	16623.4	14118.75	2755.5	6179.95
22	2000	110	NaN	42518.7	2943.65	12011.85	25241.2	44348.6	18463.3	15823.95	3672.8	7100.9

110 | 112 | 122 | 124 | 132 | 134 | 136 | 138 | 142 | 144 | 146 | 156 | 158 | 160 | 172

Next session:

The GVAR Toolbox: Model Specification
and Estimation