A User Interface for Running G7 Macro Model

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Abstract

Normally, we develop and apply a macro model under the same modeling software system such as G7, EVIEWS, and so on. In the case that if we hope to put the model into an internal information platform so that more people can use the model to do forecasting or policy simulation by themselves, it would be necessary to provide a user interface which is of as less as possible knowledge about the model development software such as EVIEWS and G7.

Some work has been done to have a user interface for running G7 macro model independent on G7 environment.

This paper consists 4 parts which are: 1. Why do we have this issue? 2. What is the advantage of G7 in realizing the object? 3. How is the current situation of the solution? 4. Which is the more reasonable and more satisfactory solution?

1. Why do we have this issue?

We often have some particular requirements from our partners when we make economic model and use the model in a research project or in normal economic analyses. Most of their requirements are the possibility to use the model by themselves, rather than just we use the model and tell them the results. In fact, if a model is a kind of product, we are located in the development stage of "farmer economy" which has the feature of using the product by the producer self.

This kind of special requirement is getting stronger and stronger, at least at different level of our information center system. The reason is, nearly every information center has network site called information platform on which lot of economic research fruits are displayed, including model simulation or forecasting if any. On the other hand, the users of the information platform more or less have knowledge of economic modeling and are also interesting in "playing" models although they have no time or experiences in model building, especially in mastering the model development tools such as the software of EVIEWS or G7.

To meet the needs mentioned above, it is better to let a model run independently leaving the software environment of developing the model. It is also necessary to provide user interface for preparing the values for exogenous variables, the fixer demands for endogenous variables and the specific requirements for tabling the results from running the model, according to the rules from the model development software tool.

2. What is the advantage of G7 in realizing the object?

To reach the objective mentioned in section 1, models developed by using different software have different difficulties. For example, the model developed by using EVIEWS will have to run in EVIEWS. Therefore, all the necessary preparations before running the model have to be done in EVIEWS. To run a model, the EVIEWS itself has to be run because the execution of the model needs its interpretation. It is decided by the relationship and mechanism between the development software and the mode. It means it will be necessary to master some knowledge about EVIEWS if ones hope to "play" a model developed by using EVIEWS.

However, the models developed by using the software G7 have the potential advantage to run it without G7. As we know, the model developed by using G7, in fact, is an executable file called "run.exe" in the case of macro model or an executable file called "dyme.exe" in the case of inter-industry (Econometric plus Input-output) model. It means that the model can run individually or independently.

This feature gives us the opportunity to use the model without much knowledge about G7. In other words, if we can design a user interface in which all the necessary preparations for running a model (give values to exogenous variables, set fixer information for endogenous variables) and for looking or comparing the results from model run (set display table format) can be done with the forms that people are easy to learn and to operate.

Based on the opinion above, a user interface for running G7 macro model has be developed.

3. How is the current situation of the solution?

The current situation of the solution for user interface to run G7 macro model is a single user version, which needs to be installed into his/her PC and has the name "Economic Model application System".

(1) Start the system

When clicking the icon of the application system on desktop, following window (Fig. 1) will come out. One has to select the item set working folder in which there is the model to be played because all the other items in the main menu are dark or inactive except the help item.

Economic Model	Application Sys	stem	-		
Set Working Folder	Exog.Endog	Run Model	Table Setting	Compare Results	Help

Fig. 1 Initial Window of the System

In the selected file folder, there has to be the file "build.cfg" which is one of the necessary files during the model building. We need some information, specially the build working space (BWS) bank name from this file.

i 🖡 select workin	g folder			×
查找范围(I):	🔋 NorthCyprus	5	-	
C.	名称		修改日期	类型 ^
最近访问的位	BUILD		2011/12/24 22:25	CFG 文件
盂	🧟 G		2010/6/11 21:48	CFG 文件
	🛋 Run		1997/8/29 20:22	CFG 文件
桌面	🛋 tables		2012/6/3 20:01	CFG 文件
<mark>」</mark> 库				
《 集》 计算机				
	•			4
M3A	文件名(M):	BUILD	-	打开(0)
	文件类型(T):	G7 configuration file	•	取消

Fig. 2 The Working Folder Window

After confirming the "build.cfg" file, a new window will come out to ask the "stub" file which is necessary when displaying exogenous or endogenous variables.

Please give t	he stub file nam	e of the data	base		×
查找范围(I):	🔒 NorthCypru	s		- + 🗈 💣	
C.	名称			修改日期	类型 ^
最近访问的位	📄 hist			2011/11/29 9:28	STB 文件
盂	🔳 look			2011/6/18 16:54	STB 文件
	🛋 tables			2011/11/29 10:10	STB 文件
桌面					
) F					
《 】 计算机					
	•				•
P-12-P	文件名(80):	look		-	打开(0)
	文件类型(T):	.stb文件		•	取消
		,			

Fig. 3 The Window to Select "Stub" File

After the selection of "stub" file, the main menu of the system changed into following in which all the items of the main menu are bright or active.

	Set Working Folder	Exog.Endog	Run Model	Table Setting	Compare Results	Help

(2) Prepare the .fix file

For the preparations of giving values to exogenous variables or set fixer information for endogenous variables, you can select the sub-item of the item "Exog.Endog" accordingly.



Fig. 5 The Sub Menu of "Exog. Endog" Option

If the sub-item "Give Value to Exog. Variables" is selected, a working interface, as following, will be displayed.



Fig. 6 The Window for Giving Values to Exogenous Variables

To give values to an exogenous variable out of the sample period, select the variable from the left column. The historical values, the growth rates and the curve (with black color) of the selected variable in sample period will be displayed in different area of the window, respectively. There are three different ways for giving values to the selected exogenous variable:

- (A) Give the absolute number in the column of "Value". The interpolation will be executed automatically if two numbers are given to two periods which are not next to each other. As soon as giving the values by this way, the corresponding growth rates will be automatically displayed in the "Rate(%)" column and its curve will be extended with red color.
- (B) Give the growth rate number in the column of "Rate(%)". The interpolation will be executed automatically if two numbers are given to two periods which are not next to each other. As soon as giving the values by this way, the corresponding absolute numbers will be automatically displayed in the "Value" column and its curve will be extended with red color.
- (C) Extend the curve by using the mouse. When moving the mouse (press down the left clicker and move the cursor) and extending the curve, a red line connected to the historical data curve (black line) will be displayed, the corresponding absolute numbers and the growth rates of the extending red line will be automatically displayed in the columns of "Value" and "Rate(%)".

🗈 Edit Exogenous Variable						
Exogenous	"Student	number fr	om Turkey	,"		
vadN1 StuFmTurk	Time	Value	Rate(%)	-	48809.6	
pubincN pubinvestN	2003	18398.000	20.19			
exp2TurkN exp2EuN	2004	22626.000	22.98			
TurkgdpD	2005	28565.000	26.25		41022.2	
TouTurk	2006	26873.000	-5.92			
Exrate_NC	2007	29837.000	11.03		33234.9	
Vauxi	2008	33288.000	11.57			
	time	Value R	ate(%)	Π.		
	(2009)	<u>300.0000</u> 0.	.04		25447.5	
	(2010)	33866.661	.70			
	(2011)	34433.331	.67		17660.1	
	(2012)	35000.001	.65			
				_		
					9872.7 1998 2000 2005 2010	
Endogenous		Load	Sam		Evi+	
Endogenous_		LUAU	540	с –	EXIC	

Fig. 7 The Window for Giving Values to Exogenous Variables

The exogenous values given by those three ways can be saved by clicking the button "Save" and the saved file will have the suffix "fix" automatically. It is also possible to load a file, by click the "Load" button, to restore the previous work for giving values to exogenous variables.

If the sub-item "Set Fixer for Endog. Variables" in Fig.5 is selected, or if the button located at the down-left corner in Fig. 6 or Fig. 7 is selected, a working interface, as following, will be displayed.

🗉 endogenous Variable Adjustment 🕞 🗉 💌									
Endogenous Var.	"Private income, current price"								
privincN privconsN	period	Actual	Simulated	Error	Add	Mul	Replace	Skip	
TotStu	1998	178883872							
privinvestN	1999	296674112							
expN	2000	546118400							
gdpD	2001	938457472							
vadN3	2002	134330547							
vadN4 vadN5	2003	162906265							
vadN6 vadN7	2004	209228428							
vadN8 vadN9	2005	258201216							
vadN10 vadD2	2006	334538880							-
vadD3 vadD4	Period	Add	Mul	Replace					
vadD5 vadD6	(2009)				46	1098624.0			
vadD7 vadD8	(2010)								
vadD9 vadD10	(2011)				36	30425005.0			
	(2012)								
					26	19751386.0		/	
					16	59077766.0			
					68	3404147.2			
exogenous Variabl	e				-2	92269472.0 8 2000		20	05
		Lo	ad	Save	Exit	Load	Simu. Dat	a 🗆 Disp	p. Simu. Data

Fig. 8 Set Fixer for Endogenous Variables

It can be seen that there are four parts in that window. The left or first part is a list of all the endogenous variables of the model. The second part is the sample period area which includes the actual historical data, the historical simulation values, the errors of the historical simulation, and the options for setting fixer operation (Add / Mul / Replace / Skip). The third part is the forecasting period area which includes the options for setting fixer operation (Add / Mul / Replace / Skip). The third part is the forecasting period area which includes the area of displaying curve(s).

When one selects one endogenous variable listed, the actual historical data of that variable will be displayed in the column "Actual" of the part 2 and its curve will be displayed in the fourth part, as shown in the Fig. 8 above.

If one clicks the button "Load Simu. Data", the system will show a window for selecting the data bank in which there are historical simulation values of the model and the system will load that bank and display the simulation data and the errors in the part 2 plus the simulation curve in the part 4 of the Fig.8 which looks like as following Fig. 9.

🗈 endogenous Variable Adjustment									
Endogenous Var.	"Private	income, o	urrent pr	ice"					
privincN privconsN	period	Actual	Simulated	Error	Add	Mul	Replace	Skip	<u>^</u>
TotStu	1998	178883872	178883872	0.0000					
privinvestN	1999	296674112	301247104	4572992.0					
expN	2000	546118400	565431680	19313280.					
gdpD wedN2	2001	938457472	955904448	17446976.					
vadN2 vadN3	2002	134330547	137432499	31019520.					
vadN5	2003	162906265	162983321	770560.00					
vadN6 vadN7	2004	209228428	221870336	126419072					
vadN8 vadN9	2005	258201216	252714316	-54868992					
vadD2	2006	334538880	355941964	214030848					-
vadD3 vadD4	Period	Add	Mul	Replace				s	imulate
vadD5 vadD6	(2009)				4611	098624.0		A	ctual
vadD7 vadD8	(2010)								/
vadD9 vadD10	(2011)				3630	425005.0			
	(2012)								
					2649	751386.0			
					1669	077766.0			
					6884	.04147.2			
exogenous Variabl	<u>e</u>				-292 1998	269472.0		20	05
		Lo	ad	Save	Exit	Load	Simu. Dat	a 🔽 Dis	p. Simu. Data

Fig. 9 Set fixer for Endogenous Variables

It has to be pointed that the simulation values of endogenous variables are not the values from regressions, but the values from the model simulation run in the sample period. To show their simulation value from running the model by means of data and curve is want to help user better understand the behavior of the endogenous variables.

You can select proper fixer operation for that endogenous variable in part 2 or part 3, depending upon whether a historical simulation to be carried out or a forecasting

simulation to be done. For historical simulation, there are four different fixer operations can be selected. They are Add, Multiplication (Mul), Replace and Skip, located in the part 2 of the Fig. 8 or Fig.9. For forecasting simulation, there are three different fixer operations can be selected. They are Add, Multiplication (Mul) and Replace, located in the part 3 of the Fig. 8 or Fig.9.

For fixer options Add, Multiplication and Replace, the interpolation will be executed automatically if two numbers are given to two periods which are not next to each other. To have the Skip operation, which is only suitable for historical simulation, it will be enough to appear the word "Skip" once in any period of the sample range.

Obviously, it is also possible to save the contents worked out into file by selecting the "Save" button. If some work of setting fixer information to endogenous variables has been done before and has been saved in a file, it is also possible to load that file and continue the work on that basis by selecting the "Load" button.

There is also a way to change work on setting fixer information to endogenous variables into giving values to exogenous variables by clicking the button "Exogenous Variables" located at the down-left corner of the window in Fig8 or Fig. 9.

(3) Run the Model

After finishing the preparations in giving values to exogenous variables and setting fixer information to endogenous variables, one can select the "Run Model" option from the main menu of the system in Fig. 4. To response the selection, following window which we are familiar with will be displayed.

🚹 Run Setting			×
Start Date		Type of Simulation	
Stop Date		 Deterministic Stochastic 	
		C Optimizing	
Result Bank Name			
Fix File Name (without .fix)			
优化文件名	OptSpec.op		
	OK	Cancel	

Fig. 10 To Set Model Run Information

It is exactly the same one as in G7 for running macro model.

(4) Set the Stub File for Results Comparison

💷 Display Format Setting			- • •
Current .STB f.le			
The dates to Display the resu	ilts		
The Sign below the Date line	=	Line Number on a page	60
Number of Digits	7	Blank lines on top	3
Decimal digits	1	Blank lines at bottom	9
Title Simulation and Fo	recasting of Main Variables		
<pre>gdpN: "gdp, current price" gdpR: "gdp, constant price privincR: "Private income, pubincR: "Private income, pubincR: "public income, c pubincR: "public income, c privconsN: "private consum privconsR: "private consum pubconsR: "public consumpt pubconsR: "public consumpt privinvestR: "private inve privinvestR: "private inve publicstR: "private invest"</pre>	" current price constant price onstant price pripn, courren ipn, constant stment, curren stment, curren		
		Up D	own
		+	- Modify
	Creat Load	Save Save as	Exit

Fig 11 Prepare Stub File for Compare Output

It is easy to understand the contents displayed in the Fig. 11 above. It is just for preparing the stub file which is necessary to compare the results from different runs of the model. It needs to be pointed out that if one wants to compare the values of some variables themselves, the operation is just click or select the variables plus click the button "->". In that case, the selected variables, with their descriptions, will appear in the right side box which is the place to have the variables whose values need to be compared and displayed.

For comparing or displaying a combination of several variables, such as GDP/TotPop, it is possible to type the expression in the long blank box located near the bottom of the Fig. 11.

Also it is possible to save the work by click the button "Save as" or button "Create" and reload the previous work by click "Load" button.

Fig 12 shows the situation when doing some operation on this interface.

💷 Display Format Setting			- • •		
Current .STB f.le					
The dates to Display the resu	ilts				
The Sign below the Date line	=	Line Number on a page	60		
Number of Digits	7	Blank lines on top	3		
Decimal digits	1	Blank lines at bottom	9		
Title Simulation and Forecasting of Main Variables					
<pre>impFmOthN: "import from ot exp2TurkR: "export to turk exp2EukR: "export to EUL, co exp2OthR: "export to other impFmTurkR: "import from TI impfmOthR: "import from EU, impFmOthR: "inport from ot StuFmTurk: "Student number StuFmOth: "Student number TotStu: "Total student num vadN1: "value added of sec vadN2: "value added of sec</pre>	her countrie: ey, constant j nstant price contries, c urkey, onstan onstant pri her countrie: from Turkey from other c ber" tor 1, curren tor 2, curren tor 2, curren	<pre>gdpR: "gdp, constant price" privincR: "Private income, co privincR: "Private income, co pubincN: "public income, curn gdpN/TotStu : "per studen o -></pre>	nrrent price" ponstant price" rent price" of GDP		
gdpN/TotStu : "per stude:	n of GDP	Up Dow	mModify		
	Crea	t Load Save Save as	Exit		

Fig. 12 An Example of Setting Stub File

(5) Compare and Export the Results

1 指定库,输出格式文件和输出文件	×				
Output Format file Name without .:	stb Output File Name				
┌第2个及以后数据库数据显示为────					
C Actual C Dif	C Percantage				
对每二个更职数的数据房值。					
刘母一十安4X级日初如西库填一 Bank Type Bank Name	-11言忌 Bank Type bank Name				
1	6				
2	7				
3	8				
4	9				
5 💌	10 •				
OK	Cancel				
也可以在运行比较程序之前再次编辑这个文件。					

Fig13. The Interface for Result Comparison

It is exactly the same one as in G7 for comparing results.

4. Which is the more reasonable and more satisfactory solution?

The current situation described in section 3 is only a single PC user version, it is necessary to copy all the necessary files into user's PC for application. We need to have it works in network environment. The current opinion for this point is to design a web service program which has model menu for users' selection. As soon as one user selects one model from a model list, the system will judge the legality of the user to access that model, judge whether it is his/her first time to access this model, judge if the model in server has newer version than that one of the client has had. In the case if it is his/her first time to legally access that model or if the model in server is newer than the user has had, the system will come out a window for prompting the user to download the model files, including its data bank. The server cannot send files to that user because it is not allowed from the security system of the network.

Further consideration for improving this system into a more reasonable and more satisfactory solution is to develop a new "build" program which can generate a new version of the model which can directly run in a network environment.