The Linkage between MUDAN and JIDEA

by

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1. The Mechanism of the Linkage between Two Models

Linkage method 1.

Step 1. run MUDAN for whole analysis period, write data for JIDEA

Step 2.with data from MUDAN, run JIDEA for whole analysis period, write out data for MUDAN

Step 3.with data from JIDEA, run MUDAN for whole analysis period, write data for JIDEA

If converge, finish calculation. Otherwise, repeat step 2 to 3.

1.The Mechanism of the Linkage between Two Models

- Linkage method 2
- Step 1. For year t, give assumed data (export to China and import price from China) to JIDEA.
- Step 2. Run JIDEA model. Meanwhile, MUDAN waits.
- Step 3. JIDEA converges and sends data (import from China and export price) to MUDAN. Then waits.
- Step 4. Run MUDAN with data received from JIDEA. After converging, send data (import from Japan and export price) to JIDEA. Then waits.
- Step 5. If both models FTA-converged, t+1=>t. Run from step 1 again. Otherwise, go to step 2 and run JIDEA with received data until both models FTA-converged.

1.The Mechanism of the Linkage between Two Models

The advantage of method 1:

1.Easily to realize through making a DOS batch file to run two models one by one.

2.Just need to add some program for writing and reading data to exchange data between two models.

The disadvantage of method 1:

1.The inter-influence of the two models in one same year cannot be dynamically and immediately simulated.

2.There maybe convergence problem.

1.The Mechanism of the Linkage between Two Models

The advantage of method 2:

1. It overcomes the disadvantage in method 1.
2. We can observe the run of the two models at the same time from two separate DOS windows.

The disadvantage of method 2:

1. It is necessary to compile the two models under C++ Builder.
2. It is necessary to have some modification on model.cpp.

Method 2 was selected. Its details are shown in Fig.1

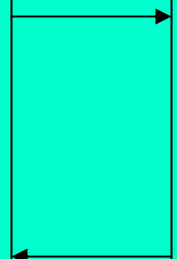
In JIDEA model, Year =t,
Load data and so on
Have assumed value for vectors:
JAexpCNr and JApimCN

FTA_AGAIN:
JIDEA model Iteration calculation

Send data and message to MUDAN
Wait for data from MUDAN

Receive data from MUDAN

If both MUDAN and JIDEA
FTA convergent, year = t+1,
otherwise go to FTA_ AGAIN.



In MUDAN model, Year = t
Load data and so on.

FTA_AGAIN:
Wait for data from JIDEA
……

Receive data from JIDEA

MUDAN iteration calculation

Send data and message to JIDEA

If both MUDAN and JIDEA
FTA convergent, year = t+1,
otherwise go to FTA_AGAIN.

2.The Data Exchange between Two Models

There are several aspects need to be considered for data exchange between two models

(1). Sector number difference

(2). Currency difference

(3). Price index base year difference

(4). Trade data difference between country model and BTM

2.The Data Exchange between Two Models

(1). Sector number difference:

JIDEA model: 100 sectors (tradable 64)

MUDAN model: 59 sectors (tradable 42)

Solution:

JIDEA BTM MUDAN

100 ←→ 120 ←→ 59

from 120 to 100/59: aggregate and use weights

From 100/50 to 120: Split and use weights

2.The Data Exchange between Two Models

(2). Currency difference:

Solution: Convert into US dollar for exchange

(3). Price index base year difference

Solution: Nominal data for exchange

2.The Data Exchange between Two Models

(4) There are difference in trade data between country model and BTM due to following reasons:

I. The cost of import goods for insurance, freight and tariff. It means: JAimpCN dose not equal to CNexpJA in monetary, even measured by same currency.

II. The statistical discrepancy between BTM and country statistics.

III. Statistical definition difference, for example, the Hong Kong issue in Chinese foreign trade data .

	export data			
year	1990	1991	1992	1993
YBK	621	718	849	917
BTM	753	857	971	979
year	1994	1995	1996	1997
YBK	1210	1488	1511	1828
BTM	1400	1501	1687	2157
	import data			
year	1990	1991	1992	1993
YBK	534	638	806	1040
BTM	635	787	1011	1512
year	1994	1995	1996	1997
YBK	1156	1321	1388	1424
BTM	1548	1672	1831	1877

2.The Data Exchange between Two Models

Solution for trade data difference:

(1). Do not add up the import demand for Chinese goods from Japan and from rest of the world as the export demand of China.

(2). A regression was done between Chinese export MUDAN definition and the BTM definition of export demand from Japan and from rest of the world(some other variables, such as exchange rate and time trend, are included in this regression).

Linkage and Exchange between two models

In JIDEA model, Year =t,
Load data and so on
Have assumed value for vectors:
JAexpCNr and JApimCN

FTA_AGAIN:
JIDEA model Iteration calculation
Convert into BTM definition
Send data and message to MUDAN
Wait for data from MUDAN
……

Receive data from MUDAN
Convert from BTM to JIDEA
If both MUDAN and JIDEA
FTA convergent, year = t+1,
otherwise go to FTA_ AGAIN.

B
T
M

120
USD
Nominal

In MUDAN model, Year = t
Load data and so on.

FTA_AGAIN:
Wait for data from JIDEA
……

Receive data from JIDEA
Convert from BTM to MUDAN
MUDAN iteration calculation
convert into BTM definition
Send data and message to JIDEA

If both MUDAN and JIDEA
FTA convergent, year = t+1,
otherwise go to FTA_AGAIN.

3. **C++ code for linkage and exchange of two models**

- To use the method 2 for linkage and exchange between two models, It is necessary to compile the country model under C++ builder.
- Since JIDEA and MUDAN run under DOS windows, we got help from Yang Wang for necessary C++ builder code.
- JIDEA and MUDAN can run and communication in different file folders.
- **Show the run of the two models**

4. **The first glance of the impact on Chinese Economy**

- Three different scenarios: 5%, 10% and 15% reduction of the import price from partner country were taken.
- Run models from 1998 to 2008
- For MUDAN model, 2003 is the last data, so show result from 2004 to 2008

Table 2 The Changes of Import from Japan

	2004	2005	2006	2007	2008
Base	550	714	869	1005	1179
5% reduction	603	791	967	1122	1320
Ratio to base	1.10	1.11	1.11	1.12	1.12
10% reduction	672	892	1101	1280	1514
Ratio to base	1.22	1.25	1.27	1.27	1.28
15% reduction	761	1032	1275	1486	1765
Ratio to base	1.38	1.45	1.47	1.48	1.50

Table 3 The Changes of Export to Japan

	2004	2005	2006	2007	2008
Base	517	426	554	562	610
5% reduction	519	433	565	574	625
Ratio to base	1.00	1.02	1.02	1.02	1.02
10% reduction	520	442	582	593	648
Ratio to base	1.00	1.04	1.05	1.06	1.06
15% reduction	529	481	614	617	679
Ratio to base	1.02	1.13	1.11	1.10	1.11

Table 4. The Changes of Import from the Rest of the World

	2004	2005	2006	2007	2008
Base	3319	3487	3890	4387	5045
5% reduction	3270	3439	3832	4324	4961
10% reduction	3219	3387	3770	4251	4868
15% reduction	3171	3337	3710	4183	4784

Table 5. The Changes of GDP

	2004	2005	2006	2007	2008
Base	122,472	131,618	144,350	157,965	174,236
5% reduction	122,473	131,634	144,373	157,992	174,265
10% reduction	122,480	131,662	144,417	158,039	174,318
15% reduction	122,501	131,750	144,500	158,115	174,405

4. **The first glance of the impact on Chinese Economy**

- Tendency that the more reduction of the import price from Japan, the more the increase of import from Japan .
- the more reduction of the import price from China to Japan, the more the increase of the export from China to Japan

4. **The first glance of the impact on Chinese Economy**

- the range of the increase in import from Japan and export to Japan is quite different.
- Chinese economy has higher sensibility on import price than Japanese economy.

4. **The first glance of the impact on Chinese Economy**

- The more the reduction of the import price from Japan, the less the Chinese import from the rest of the world
- All reductions on import price have positive effect on GDP increase, even the increase of import itself has negative effect in the definition of GDP.

Thank you!