The MCI Model Workbook

Ray C. Fair

November 11, 2013

Contents

1 Model Updates **7**
1.1 Different Versions of the MC Model 7

2 The MCI Model on the Website **9**
2.1 Notation 9
2.2 Solution Options 9
2.3 Changing Stochastic Equations 10
2.4 Creating Base Datasets 11
2.5 Treatment of the EMU Regime 11

3 Some Properties of the Model **13**
3.1 COG Increase 13
3.2 TRGHQ Increase 14
3.3 D1G Decrease 14
3.4 RS Increase 15
3.5 CG Increase 15
3.6 US Price Shock, RS exogenous 16
3.7 US Dollar Depreciation 17

4 Estimated Effects of a Yuan Appreciation **19**
4.1 Yuan Appreciation: Full Version of the Model 19
4.2 Yuan Appreciation: Chinese PY Equation Dropped 20

5 Is Fiscal Stimulus a Good Idea? **21**
5.1 Table 1: Transfer Payment Multipliers 21
5.2 Table 5: Results for WAIT, RULE: 1992:1–2005:4 22

6 Estimated European Inflation Costs **23**

7 Testing for a New Economy in the 1990s **25**

8 Policy Effects in the Post Boom U.S. Economy **27**
8.1 Experiment 1: No Tax Cuts 27
8.2 Experiment 2: No G Increase 28
8.3 Experiment 3: No RS Decrease 28
8.4 Experiment 4: No Stimulus—Experiments 1, 2, and 3 29
8.5 Experiment 5: No Stimulus and No Stock Market Decline 29
8.6 Experiment 6: No Stimulus and No Export Decline 30
8.7 Experiment 7: Experiments 5 and 6 Combined 30

9 Estimated Effects of the U.S. Stimulus Bill **31**
9.1 Stimulus Experiment 31

10 What It Takes to Solve the U.S. Deficit Problem **35**
10.1 Table 1: Transfer Payment Multipliers 35
10.2 Table 2: Base Run 36
10.3 Table 3: Transfer Payment Decrease of One Percent of GDP 36

Preface

The first chapter discusses the various versions of the MC model, and the second chapter discusses how to use the latest version (the MCI model) on the website. The remaining chapters discuss various experiments that can be performed using the model. These are experiments that are in **Macroeconometric Modeling** (henceforth called **MM**), which is the main reference for the model in this site. These experiments give a good idea of the properties of the model. Most of the experiments use actual, historical data. A few experiments use observations beyond the end of the actual data. These observations are forecast data from the November 11, 2013, forecast. You can duplicate the results in **MM** by doing the experimens using the MCI model. The results will not exactly match if you use earler versions of the MC model.

If you run an experiment, you can examine the results for any country and any variable in the model, including the bilateral trade flows—exports from country i to country j. You can also compare the results using the MCI model to results using earlier versions of the MC model to see how much the properties of the MC model have changed over time. In general you will see that the changes are small.

You will see that for most experiments the historical errors are added to the equations before the experiment is performed. This allows the perfect tracking solution to be the base path, from which changes can then be made. If you did not use the historical errors, you would have to first create a base path of predicted values, to which the new predicted path (after the experiment has been performed) would be compared. See Section 2.6 of **The US Model Workbook** for more discussion of this.

There may be a few rounding differences between the results in **MM** and the results you generate using the website. In addition, when you change CG for a particular experiment, you will see that the actual changes differ slightly from the changes you entered. This has to due with the fact that the left hand side variable of the CG equation is CG divided by $YS_{-1} \cdot PX_{-1}$, where PX is endogenous. The way the coding works on the website, changes in PX affect your chosen values of CG. This is not true of the coding used to generate the results in **MM**. The differences are, however, small and can safely be ignored.

Finally, this workbook is not self contained; it assumes that the reader has some understanding of the model. You should read the relevant parts of **MM** before using this workbook.

Ray C. Fair
November 11, 2013

Chapter 1

Model Updates

1.1 Different Versions of the MC Model

The MCA Model

The MCA model on the website is the exact model in **Fair (2004), Estimating How the Macroeconomy Works**—see Chapter 2 and Appendices A and B. If you want to duplicate the results in this book, you should work with the MCA model. It has its own workbook: **The MCA Model Workbook, 2003**.

The MCB Model

The MCB model on the website is the model used for the results in **Fair (2005), Policy Effects in the Post Boom U.S. Economy**. It has its own Appendices A and B and its own workbook: **The MCB Model Workbook, October 29, 2004**. If you want to duplicate the results in this paper, you should work with the MCB model.

The MCC Model

The MCC model is used for the results in **Fair (2007a), A Comparison of Five Federal Reserve Chairmen: Was Greenspan the Best?**, and in **Fair (2007b), Evaluating Inflation Targeting Using a Macroeconometric Model**. It has its own Appendices A and B and its own workbook: **The MCC Model Workbook, August 1, 2006**. If you want to duplicate the results in these two papers, you should work with the MCC model.

The MCD Model

The MCD model is not used for any papers on the website. It has its own Appendices A and B and its own workbook: **The MCD Model Workbook, March 1, 2009**.

The MCE Model

The MCE model is used for the results in **Fair (2012a), Has Macro Progressed?**, in **Fair (2011), Possible Macroeconomic Consequences of Large Future Federal Government Deficits**, in **Fair (2010a), Estimated Macroeconomic Effects of a Chinese Yuan Appreciation**, and in **Fair (2010b), Estimated Macroeconomic Effects of the U.S. Stimulus Bill**. It has its own Appendices A and B and its own workbook: **The MCE Model Workbook, January 30, 2019**. If you want to duplicate the results in these four papers, you should work with the MCE model.

The MCF Model

The MCF model is not used for any papers on the website. It has its own Appendices A and B and its own workbook: **The MCF Model Workbook, January 29, 2011**.

The MCG Model

The MCG model is not used for any papers on the website. It is the same as the MCF model except the version of the US model used is the April 28, 2011, version rather than the January 29, 2011, version. Appendix B is the same as for the MCF model, and Appendix A is the appendix for the US model dated April 28, 2011. The MCG model has no workbook.

The MCH Model

The MCH model is used for the results in **Fair (2012b), What It Takes to Solve the U.S. Government Deficit Problem**. It has its own Appendices A and B and its own workbook: **The MCH Model Workbook, April 27, 2012**. If you want to duplicate the results in this paper, you should work with the MCH model. The MCH model is described completely in **Macroeconometric Modeling (MCH Version)**.

The MCI Model

The MCI model is discussed in this workbook. It is dated November 11, 2013, and is described completely in **MM**. It has its own Appendices A and B. The model is dated November 11, 2013.

Chapter 2

The MCI Model on the Website

This chapter discusses practical things you should know when working with the MCI model. It relies on Part 3 and Appendices A and B in **MM**. If you are planning to work with the MCI model, it may be helpful to have hard copies of this material available for ease of reference. In what follows all references to sections, subsections, and tables are to those in **MM**.

2.1 Notation

The notation for the variables in the ROW model is presented in Tables B.1 and B.2 in Appendix B. Two letters denote the country (CA for Canada, JA for Japan, etc.), and the abbreviations are given in Table B.1. Up to five letters denote the variable (C for consumption, I for investment, etc.), and the names are given in Table B.2 in alphabetical order. The complete name of a variable for a country consists of the country abbreviation plus the variable name, such as CAC for Canadian consumption, JAI for Japanese investment, etc. The two letters EU denote the European countries in the model that are part of the EMU. These are: AU, FR, GE, IT, NE, FI, BE, GR, IR, PO, SP. (Luxembourg, which is also part of the EMU, is not in the model.) (GR joined January 1, 2001.)

2.2 Solution Options

There are three choices you can make regarding the solution of the MCI model.

1. The prediction period, where the default is 2014-2022.

2. The number of within country iterations (denoted LIMITA) and the number of across country iterations (denoted LIMITB). The defaults are 10 for LIMITA

and 10 for LIMITB. As discussed below, these options are useful for checking if the model has successfully solved.

3. Whether or not you want to use the historical errors. The default is to set all the error terms equal to zero. If you use the historical errors and make no changes to any of the exogenous variables and coefficients, then the solution values of the endogenous variables will be the actual values—a perfect tracking solution—aside from rounding error. This option can be useful for multiplier experiments, as discussed below.

The way in which the model is solved is discussed in Section 7.6 in Appendix B. Because the MCI model (unlike the US model alone) is not iterated until convergence (because LIMITA and LIMITB above are fixed), it may be the case that after the program finishes the model did not really solve. If you are concerned about this, there is one check that you can perform, which is to increase LIMITA and LIMITB. If the model has correctly solved, it should be the case the increasing LIMITA and LIMITB has a very small effect on the solution values. You can thus increase LIMITA and LIMITB and see if the output values change much. If they do not, then you can have considerable confidence that the model has been solved correctly. The maximum values of LIMITA and LIMITB that you are allowed are 15 and 15, respectively. Another check is that if the predicted values are either extremely large or extremely small, then the model is unlikely to have solved. If this is true, you have probably made extreme changes to one or more exogenous variables or coefficients.

2.3 Changing Stochastic Equations

There are four changes you can make to any of the stochastic equations:

1. Drop (or add back in) an equation. When an equation is dropped, the variable determined by the equation is taken to be exogenous, and it can be changed if desired. The default values for the variable are the historical values when they exist and forecast values from the base dataset otherwise.

2. Take an equation to begin after the beginning of the basic prediction period. When an equation begins later than the basic prediction period, the variable determined by the equation is taken to be exogenous for the earlier period, and it can be changed if desired. The default values for the variable are the historical values when they exist and forecast values from the base dataset otherwise. For quarterly countries the period that you want the equation to begin is a quarter, not a year. You can, for example, have an equation begin in 2014:2 when the basic prediction period is 2014-2022.

3. Add factor an equation, where the add factors can differ for different periods. For quarterly countries the add factors are for individual quarters, not years.

4. Change any of the coefficients in the stochastic equations. You cannot add variables to the equations.

2.4 Creating Base Datasets

If you ask the program to solve the MCI model for any period beginning 2014 or later *and* you make no changes to the coefficients and exogenous variables, the solution values for the endogenous variables will simply be the values that are already in MCIBASE. If, on the other hand, you ask the program to solve the model for a period beginning earlier than 2014, where at least some actual data exist, the solution values will not be the same as the values in MCIBASE because the model does not predict perfectly (the solution values of the endogenous variables are not in general equal to the actual values). It is thus very important to realize that the only time the solution values will be the same as the values in MCIBASE when you make no changes to the exogenous variables and coefficients is when you are solving beginning 2014 or later.

If you want to work with the MCI model for a period for which actual data exist, you will probably want to use the historical errors (i.e., set the errors equal to their estimated values and take them to be exogenous). If for any period you use the historical errors and solve the model with no changes in the exogenous variables and coefficients, you will get a perfect tracking solution. This is usually a good base to perform various experiments.

2.5 Treatment of the EMU Regime

As noted above, there are 10 countries in the model that are part of the EMU beginning January 1, 1999: AU, FR, GE, IT, NE, FI, BE, IR, PO, and SP. GR joined January 1, 2001. EU denotes these countries. Prior to 1999 each of these countries has an estimated interest rate reaction function (equation 7), and each country except FI, SP, and GR has an estimated long term interest rate equation (equation 8). In addition, GE has an estimated exchange rate equation where the exchange rate explained is the DM/$ rate, and each of the other countries has an estimated exchange rate equation where the exchange rate explained is the local currency/DM rate (equation 9).

For the EMU regime, which begins in 1999:1 for 10 countries and 2001:1 for GR, equations 7, 8, and 9 for the individual EMU countries are dropped from the model. EU equations 7, 8, and 9 are added beginning in 1999:1.

The software allows you to change the EU interest rate and exchange rate equations. The "country" that you will click is EU. Remember that these equations are only relevant from 1999:1 on. Also remember that the equations that have been dropped for the individual EMU countries from 1999:1 on are not part of the model from 1999:1 on. They only matter prior to 1999:1. For GR the switch date is 2001:1.

There is one special feature of the on line software regarding the EMU regime, which pertains to equations 7 and 8 explaining RS and RB. As mentioned above, for the EMU countries these equations end in 1998:4 (2000:4 for GR). If you are working with a period prior to 1999:1 and you drop equation 7, you can then change the RS values using the "Change exogenous variables" option. The variable you change, however, is not RS but RSA. For Germany (GE), for example, you change $GERSA$, not $GERS$, after you have dropped equation 7 for GE. Similarly, if you drop equation 8, you change RBA, not RB. These changes pertain only to the EMU countries; for all other countries RS and RB are changed. When you click "Change exogenous variables," for a non EMU country, ignore RSA and RBA and use RS and RB.

Chapter 3

Some Properties of the Model

Some properties of the model are reported in Section 1.2, *Has Macro Progressed?*, in **MM**. The prediction period is 2000:1–2005:4. If you do the following experiments using the MCI model, you will exactly duplicate these results.

3.1 COG Increase

This experiment shows that the output multiplier for an increase in government purchases of goods of 1.0 percent of real GDP is 1.6 percent of real GDPafter four quarters.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2005.

3. Click "Examine the results without solving the model." List the values of $GDPR$ for 2000:1–2005:4. Take 1.0 percent of each of these values, and call them the "COG increases." Then return to the main menu page.

4. Click "Use historical errors" and set the option to use the historical errors.

5. Click "Change exogenous variables" and ask to change COG for the United States. Type in the COG increases quarter by quarter. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

3.2 TRGHQ Increase

This experiment shows that the output multiplier for an increase in real federal government transfer payments of 1.0 percent of real GDP is 0.8 percent of real GDP after six quarters.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2005.
3. Click "Examine the results without solving the model." List the values of $GDPR$ for 2000:1–2005:4. Take 1.0 percent of each of these values, and call them the "$TRGHQ$ increases." Then return to the main menu page.
4. Click "Use historical errors" and set the option to use the historical errors.
5. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ increases quarter by quarter. Be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

3.3 D1G Decrease

This experiment shows that the output multiplier of a personal income tax rate decrease of an amount equivalent to the real transfer payment increase in the above experiment is similar to the output multiplier of the transfer payment increase.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2005.
3. Click "Examine the results without solving the model." List the values of GDP, THG, YT, $TAUG$, POP, and PH for 2000:1–2005:4. Compute for each quarter:

   $$D1G^{new} = (THG - .01 \cdot GDP)/YT - (TAUG \cdot YT)/(POP \cdot PH)$$

   Then return to the main menu page.
4. Click "Use historical errors" and set the option to use the historical errors.

5. Click “Change exogenous variables” and ask to change $D1G$ for the United States. Type in the $D1G^{new}$ values quarter by quarter. Be sure to save the changes once you are done.

6. Click “Solve the model and examine the results”.

3.4 RS Increase

This experiment shows that the real output multiplier of an interest rate increase of 1.0 percentage points is -0.6 percent of real GDP after eight quarters.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.

2. Click “Set prediction period” and set the period to be 2000 through 2005.

3. Click “Use historical errors” and set the option to use the historical errors.

4. Click “Drop or add equations” and drop the RS equation for the United States (equation 30).

5. Click “Change exogenous variables” and ask to change RS for the United States. Then add 1.0 to all the values. Be sure to save the changes once you are done.

6. Click “Solve the model and examine the results”.

If you do this experiment for the 1994–1998 period and you decrease RS by 1.0 rather than increase it, you will duplicate the results in Table 1 in Subsection 4.4.2, “The Effects of a Decrease in RS,” in **MM**.

3.5 CG Increase

This experiment shows that wealth effects from stock market changes are fairly large in the model. The experiment is an increase in CG of 10 percent of nominal GDP (40 percent at an annual rate) in 2000:1.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.

2. Click “Set prediction period” and set the period to be 2000 through 2005.

3. Click "Examine the results without solving the model." List the value of GDP for 2000:1. Take 40.0 percent of this value, and call them the "CG increase." Then return to the main menu page.

4. Click "Use historical errors" and set the option to use the historical errors.

5. Click "Drop or add equations" and for the United States drop the CG equation (equation 25).

6. Click "Change exogenous variables" and ask to change CG for the United States. Type in the CG increase for 2000:1. Leave the other quarters the same. Be sure to save the changes once you are done.

7. Click "Solve the model and examine the results".

3.6 US Price Shock, RS exogenous

This experiment shows that positive price shocks are contractionary even if the Fed keeps the nominal interest rate unchanged. This feature has important implications for monetary policy.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2005.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and drop the RS equation for the United States (equation 30).

5. Click "Modify equation coefficients" and ask to modify equation 10, the PF equation, for the United States. Then add .005 to the fifth coefficient in the equation (the constant term). Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

If you do this experiment for the 1994–1998 period, you will duplicate the results in Table 1 in Subsection 4.1.2, "Estimated Effects of a Positive Inflation Shock," in **MM**.

3.7 US Dollar Depreciation

This experiment shows that a depreciation of the dollar is inflationary and contractionary. It is contractionary because the negative effects from the increase in prices more than offset the positive effects from a decrease in imports and increase in exports.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2005.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and drop the exchange rate equation (E equation) for JA, AS, KO, NZ, PH, and EU. Also, drop the exchange rate equation (H equation) for ST, UK, DE, NO, and SW.
5. Click "Change exogenous variables" and ask one at a time to change the values of E for CA, JA, AS, KO, NZ, PH, EU, SO, SA, VE, CO, JO, SY, ID, MA, PA, TH, CH, AR, BR, CE, ME, and PE. Ask to multiply each value by 0.9. Be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

Chapter 4

Estimated Effects of a Yuan Appreciation

This chapter presents two of the experiments in Section 4.5, *Estimated Macroeconomic Effects of a Chinese Yuan Appreciation*, in **MM**. The first experiment is the one in Table 1, and the second experiment is the one in Table 4.

4.1 Yuan Appreciation: Full Version of the Model

This experiment duplicates the results in Table 1.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1999 through 2008.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Change exogenous variables" and ask to change CHE for China. Ask to multiply each of the existing values by .75. Hit Enter and then "Commit to Changes."
5. Click "Solve the model and examine the results".

The differences between the new forecast values and the base values are the estimated effects of the yuan appreciation. (Remember that a decrease in CHE is an appreciation of the yuan.)

4.2 Yuan Appreciation: Chinese PY Equation Dropped

This experiment duplicates the results in Table 4.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.
2. Click “Set prediction period” and set the period to be 1999 through 2008.
3. Click “Use historical errors” and set the option to use the historical errors.
4. Click “Drop or add equations,” click China, and uncheck the CHPY box.
5. Click “Change exogenous variables” and ask to change CHE for China. Ask to multiply each of the existing values by .75. Hit Enter and then “Commit to Changes.”
6. Click “Solve the model and examine the results”.

The differences between the new forecast values and the base values are the estimated effects of the yuan appreciation with the Chinese PY equation dropped.

Chapter 5

Is Fiscal Stimulus a Good Idea?

This chapter presents two of the experiments in Section 4.6, *Is Fiscal Stimulus a Good Idea?* in **MM**.

5.1 Table 1: Transfer Payment Multipliers

This experiment is the one used for the results in Table 1 in Subsection 4.6.4, *Transfer Payment Multipliers*, in **MM**.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 1992 through 2005.

3. Click "Examine the results without solving the model." List the values of YS, $PSI13$, JG, HG, JM, HM, JS, HS, and $STATP$ for 1992:1–2005:4. Compute for each quarter:

   $$GDPRS = YS + PSI13(JG \cdot HG + JM \cdot HM + JS \cdot HS) + STATP$$

   Then take 1.0 percent of each of the values of $GDPRS$, and call them the "$TRGHQ$ increases." Then return to the main menu page.

4. Click "Use historical errors" and set the option to use the historical errors.

5. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ increases quarter by quarter. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

5.2 Table 5: Results for WAIT, RULE: 1992:1–2005:4

This experiment is the one used for the results in Table 3 in Subsection 4.6.6, *Results*, in **MM**.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 1992 through 2005.

3. Click "Examine the results without solving the model." List the values of YS for 1992:1–2005:4. Then for 1992:1 take 0.5 percent of YS, for 1992:2 take 1.0 percent, for 1992:3 take 1.5 percent, for 1992:4–1993:4 take 2.0 percent, for 1998:1 take $minus$ 0.5 percent, for 1998:2 take $minus$ 1.0 percent, for 1998:3 take $minus$ 1.5 percent, and for 1998:4–1999:4 take $minus$ 2.0 percent. Call these the "$TRGHQ$ changes." Then return to the main menu page.

4. Click "Use historical errors" and set the option to use the historical errors.

5. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ changes quarter by quarter. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

Chapter 6

Estimated European Inflation Costs

This chapter explains how to perform the German monetary policy experiment in Section 5.1, *Estimated European Inflation Costs from Expansionary Policies*, in **MM**. It duplicates the results in Table 1 in this section. This is a nice example for learning some of the features of the MCI model and for learning how to work with it. Once you have mastered this experiment, you may want to perform others to examine what else macro policies might have done in the 1980s to reduce European unemployment and at what price level and inflation costs.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 1982 through 1990.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and for the Germany drop the RS equation (equation 7).

5. Click "Change exogenous variables" and ask to change $GERSA$ for Germany. (NOTE: This is $GERSA$, not $GERS$. See the discussion in Chapter 2, Section 2.5, of this workbook.) Then add -1.0 for 19821-19834, add -.75 for 19841-19854, add -.5 for 19861-19874, and add -.25 for 19881-19904. Be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

Chapter 7

Testing for a New Economy in the 1990s

This chapter explains how to perform the “no stock market boom” experiment in Section 5.3, *Testing for a New Economy in the 1990s*, in **MM**.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.
2. Click “Set prediction period” and set the period to be 1995 through 2002.
3. Click “Use historical errors” and set the option to use the historical errors.
4. Click “Drop or add equations” and for the United States drop the CG equation (equation 25).
5. Click “Change exogenous variables” and ask to change CG for the United States. Ask to replace each existing value with 126.4. Hit the enter key and then be sure to save the changes once you are done.
6. Click “Solve the model and examine the results”.

Chapter 8

Policy Effects in the Post Boom U.S. Economy

This chapter explains how to perform the seven experiments in Section 5.4, *Policy Effects in the Post Boom U.S. Economy*, in **MM**.

8.1 Experiment 1: No Tax Cuts

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2000 through 2004.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).
5. Click "Change exogenous variables" and ask to change $D1G$ for the United States. Change the first quarter of the prediction period to be 20004 (not 20001) and the last quarter of the prediction period to be 20043 (not 20044). Then ask to replace each existing value with the actual value of $D1G$ in 2000:3, which is 0.0572. Hit the enter key and then be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

8.2 Experiment 2: No G Increase

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2004.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).

5. Click "Examine the results without solving the model." List the values of COG and YS for 2000:1–2004:4. Compute COG/YS for 2000:3, and call this γ. This value is 0.042657. For the quarters 2000:4–2004:3, compute γYS, and call these the "new values of COG." Then return to the main menu page.

6. Click "Change exogenous variables" and ask to change COG for the United States. Then enter quarter by quarter the new values of COG for 2000:4–2004:3. (Make sure to save the changes once you are done.)

7. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

8.3 Experiment 3: No RS Decrease

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2000 through 2004.

3. Click "Use historical errors" and set the option to use the historical errors.

4. Click "Drop or add equations" and for the United States drop the CG equation (equation 25) and the RS equation (equation 30).

5. Click "Change exogenous variables" and ask to change RS for the United States. Change the first quarter of the prediction period to be 20004 (not 20001) and the last quarter to beo 20043 (not 20044). Then ask to replace

each existing value with 6.017. (6.017 is the actual value of RS in 2000:3, which you can see from the page you are on.) Hit the enter key and then be sure to save the changes once you are done.

6. Click "Solve the model and examine the results".

The model will be solved for the entire 2000:1–2004:4 period, but the period of interest is only 2000:4–2004:3. You can ignore the first three quarters of 2000 (there are no changes here anyway) and the last quarter of 2004.

8.4 Experiment 4: No Stimulus—Experiments 1, 2, and 3

1. Combine experiments 1, 2, and 3, i.e., change $D1G$, COG, and RS.

8.5 Experiment 5: No Stimulus and No Stock Market Decline

1. Do the set up for experiment 4 and then do the following extra steps.

2. Click "Change exogenous variables" and ask to change CG for the United States. Then type in the following values. (Make sure to save the changes once you are done.)

	CG
2000.4	233.6364377
2001.1	235.1029462
2001.2	236.3933658
2001.3	237.8985975
2001.4	237.9940319
2002.1	238.9499975
2002.2	239.0618679
2002.3	239.0188709
2002.4	239.7247147
2003.1	240.5048411
2003.2	241.4795930
2003.3	241.7344321
2003.4	244.9782530
2004.1	247.7131508
2004.2	250.0174220
2004.3	253.1941501

3. Click “Solve the model and examine the results”.

(These are the exact values of CG used in the experiment.)

8.6 Experiment 6: No Stimulus and No Export Decline

1. Do the set up for experiment 4 and then do the following extra steps.

2. Click “Examine the results without solving the model.” List the values of EX and YS for 2000:1–2004:4. Compute EX/YS for 2000:3, and call this γ. This value is 0.11125. For the quarters 2000:4–2004:3, compute $1000(\gamma YS - EX)$, and call these the “$USXS$ differences.” Then return to the main menu page.

3. Click “Change exogenous variables” and ask to change $USXS$ for the United States. Type in the $USXS$ differences quarter by quarter. (The new values are then the base values plus the $USXS$ differences.) The relevant period is 2000:4–2004:3 . (Make sure to save the changes once you are done.)

4. Click “Solve the model and examine the results”.

This experiment is designed to keep U.S. exports, EX, equal to γ times potential output, YS, where γ is the ratio of EX to YS in 2000:3. Originally this was done by exogenous changes in other countries’ demands for U.S. goods. It is, however, easier just to change $USXS$ in the manner above, which has been done here.

8.7 Experiment 7: Experiments 5 and 6 Combined

1. Combine experiments 5 and 6.

Chapter 9

Estimated Effects of the U.S. Stimulus Bill

This chapter presents the stimulus experiment in Section 5.5, *Estimated Macroeconomic Effects of the U.S. Stimulus Bill*, in **MM**. The MCI model forecast is the baseline forecast for this experiment.

9.1 Stimulus Experiment

This experiment duplicates the results in Table 4 in Subsection 5.5.3, *The Stimulus Experiment*, in **MM**.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2009 through 2020.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Change exogenous variables" and ask to change $TRGHQ$ for the United States. Then type in the following values in the "New-Base" boxes:

	TRGHQ
2009.2	-79.0
2009.3	-91.4
2009.4	-91.4
2010.1	-91.4
2010.2	-91.4
2010.3	-91.4
2010.4	-25.4
2011.1	-25.4
2011.2	-25.4
2011.3	-25.4
2011.4	-2.8
2012.1	-2.8
2012.2	-2.8
2012.3	-2.8
2012.4	-2.7

Then ask to change COG for the United States. Then type in the following values in the "New-Base" boxes:

	COG
2009.2	-5.4
2009.3	-7.6
2009.4	-7.5
2010.1	-7.5
2010.2	-7.5
2010.3	-7.4
2010.4	-7.9
2011.1	-7.8
2011.2	-7.8
2011.3	-7.7
2011.4	-6.0
2012.1	-5.9
2012.2	-5.9
2012.3	-5.8
2012.4	-3.9

Then click "Commit to Changes."

5. Click "Solve the model and examine the results".

The differences between the new forecast values and the base values are the *negative* of the estimated effects of the stimulus bill. The new values are estimates assuming no stimulus bill, and the base values are estimates assuming the stimulus bill (which is the actual situation since the bill passed). The signs are reversed in Table 4 in Subsection 5.5.3 in **MM**.

Chapter 10

What It Takes to Solve the U.S. Deficit Problem

This chapter presents results in Section 5.6, *What It Takes to Solve the U.S. Government Deficit Problem*, in **MM**. The MCI model forecast is the baseline forecast for these results.

10.1 Table 1: Transfer Payment Multipliers

This experiment is the one used for the results in Table 1 in Subsection 5.6.3, *Transfer Payment Multipliers*, in **MM**.

1. Click "Solve" under "MCI Model" in the left menu and copy MCIBASE to a dataset you have named.

2. Click "Set prediction period" and set the period to be 2014 through 2022.

3. Click "Examine the results without solving the model." List the values of YS, $PSI13$, JG, HG, JM, HM, JS, HS, and $STATP$ for 2014:1–2022:4. Compute for each quarter:

   $$GDPRS = YS + PSI13(JG \cdot HG + JM \cdot HM + JS \cdot HS) + STATP$$

   Then take 1.0 percent of each of the values of $GDPRS$, and call them the "$TRGHQ$ increases." Then return to the main menu page.

4. Click "Use historical errors" and set the option to use the historical errors.

5. Click “Change exogenous variables” and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ increases quarter by quarter. Be sure to save the changes once you are done.

6. Click “Solve the model and examine the results”.

10.2 Table 2: Base Run

The base run in Table 2 in Subsection 5.6.4, *The Base Run*, in **MM** is the MCI model forecast. You can examine this forecast by doing the following.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.

2. Click “Set prediction period” and set the period to be 2006 through 2022.

3. Click “Examine the results without solving the model”.

10.3 Table 3: Transfer Payment Decrease of One Percent of GDP

This experiment is the one used for the results in Table 3 in Subsection 5.6.5, *The Alternative Run: Decreasing Transfer Payments*, in **MM**.

1. Click “Solve” under “MCI Model” in the left menu and copy MCIBASE to a dataset you have named.

2. Click “Set prediction period” and set the period to be 2014 through 2022.

3. Click “Examine the results without solving the model.” List the values of YS, $PSI13$, JG, HG, JM, HM, JS, HS, and $STATP$ for 2014:1–2022:4. Compute for each quarter:

   $$GDPRS = YS + PSI13(JG \cdot HG + JM \cdot HM + JS \cdot HS) + STATP$$

   Let DDD be 1/12 in 2014:1, 2/12 in 2014:2, 3/12 in 2014:4, ..., and 12/12 from 2016:4 through 2022:4. Then take $minus$ 1.0 percent of each of the values of $DDD \cdot GDPRS$, and call them the “$TRGHQ$ decreases.” Then return to the main menu page.

4. Click “Change exogenous variables” and ask to change $TRGHQ$ for the United States. Type in the $TRGHQ$ decreases quarter by quarter. Be sure to save the changes once you are done.

5. Click “Solve the model and examine the results”.

Bibliography

[1] Fair, Ray C., 2013, **Macroeconometric Modeling (MM)**, main reference for the MCI model on the website.

[2] ———, 2004, **Estimating How the Macroeconomy Works**, Cambridge MA: Harvard University Press.

[3] ———, 2005, **Policy Effects in the Post Boom U.S. Economy**, *Topics in Macroeconomics*, Vol. 5, Iss. 1, Article 19.

[4] ———, 2007a, **A Comparison of Five Federal Reserve Chairmen: Was Greenspan the Best?**, *The B.E. Journal of Macroeconomics*, Vol. 7, Iss. 1 (Contribution), Article 12.

[5] ———, 2007b, **Evaluating Inflation Targeting Using a Macroeconometric Model**, *economics - The Open-Access, Open-Assessment E-Journal*.

[6] ———, 2010a, **Estimated Macroeconomic Effects of a Chinese Yuan Appreciation**, *Business Economics*, October 2010, 233–243.

[7] ———, 2010b, **Estimated Macroeconomic Effects of the U.S. Stimulus Bill**, *Contemporary Economic Policy*, October 2010, 439–452.

[8] ———, 2011, **Possible Macroeconomic Consequences of Large Future Federal Government Deficits**, NBER, *Tax Policy and the Economy*, Vol. 25, 89–108.

[9] ———, 2012a, **Has Macro Progressed?**, *Journal of Macroeconomics*, 34, 2–10.

[10] ———, 2012b, **What It Takes to Solve the U.S. Government Deficit Problem**, *Contemporary Economic Policy*, 2012, 618–628.