The MCF Model Workbook

Ray C. Fair

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Contents

Preface

The first chapter discusses the various versions of the MC model, and the second chapter discusses how to use the latest version (the MCF model) on the website. The remaining chapters discuss various experiments that can be performed using the model. These are experiments I have done in previous papers. They give a good idea of the properties of the model. The experiments in all the chapters except Chapters 7 and 9 use actual, historical data. The experiments in Chapters 7 and 9 use observations through 2020, where the observations beyond the end of the actual data are forecast data from the January 29, 2011, forecast.

One or two tables are presented per experiment, but these tables are not discussed in any detail. The reader is referred to the relevant papers for this discussion. Results are generally presented only for the United States, but the entire MCF model has been used for all the experiments. The results in this workbook will not match exactly the results in the papers because the papers are based on earlier versions of the MC model. Also, although the prediction periods are the same, some of the data used here differ from those used in the papers because the data have been revised. The latest revised data are used for the MCF model.

If you run an experiment, you can examine the results for any country and any variable in the model, including the trade flows—exports from country i to country j. You can also compare the results using the MCF 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.

The program that was used to generate the results in the tables in this workbook is not the same as the program on the website. There may thus be a few rounding differences between the results in the tables 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 this workbook, which leads to slight differences between the website results and the results in this workbook. 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 at least skim Fair (2004), *Estimating How the Macroeconomy Works*, before using this workbook.

Ray C. Fair

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 was not used for any papers. 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 (2009), "Has Macro Progressed?" in Fair (2010a), "Possible Macroeconomic Consequences of Large Future Federal Government Deficits," in Fair (2010b), "Estimated Macroeconomic Effects of a Chinese Yuan Appreciation," and in Fair (2010c), "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, 2010*. 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 described in this workbook. It has its own Appendices A and B. The model is dated January 29, 2011.

1.2 MCF Model

The MCF model on the website is the latest update of the MC model. It includes the January 29, 2011, update of the US model. The updating consists of collecting the latest data and then reestimating the equations through the end of the data. Some specification changes have been made in moving from the MC model in Fair (2004)—the MCA model—to the MCF model, and these are discussed below. These changes are fairly modest in that the properties of the MCA and MCF models are similar. This can be seen by running the same experiment for each model.

You should read Chapter 2 in Fair (2004) before reading this workbook and before working with the MCF model. The following is a discussion of the changes than have been made from the model in Fair (2004).

ROW Model Changes Since 2004

A number of the specification changes are concerned with simplifying the model somewhat. First, the labor force variable, $L1$, is now the labor force of both men and women, and $POP1$ is the labor-force-age population of both men and women. The variables $L2$ and $POP2$ have been dropped. In addition, the armed forces variable, AF, has been dropped. These changes were dictated in part by data

availability. Equation 14 now explains $L1$, and equation 15 has been dropped. The unemployment rate, UR, is now by definition $(L1-J)/L1$, where J is employment. Also, the wage equation, equation 12, has been dropped, and the wage variable, W, is no longer used in the model. The data for W for most countries are problematic, and the decision was made to drop the variable.

Second, the potential output variable, YS, is now obtained from peak-to-peak interpolations of $\log YS$ for each country. The demand pressure variable, ZZ, is then taken to be $\log Y - \log YS$, and it is used to replace DP in the price equation 5. In addition, UR is used to replace the labor constraint variable, Z, in the labor force equation 14. These changes mean that the variables JJ, JJP, JJS, and Z can be dropped.

The MCF model has 55 fewer stochastic equations than the model in Fair (2004) (307 versus 362). The equation changes for the ROW model are:

1. Equation 1: AR, PE dropped. ST, SW, JO added.
2. Equation 2: Variable $[A/(PY \cdot YS)]_{-1}$ dropped for all equations.
3. Equation 3: JA, SA, VE, CO, JO, SY, MA, PH, TH, ME, PE dropped. ST added.
4. Equation 4: SW, GR, SP, MA dropped.
5. Equation 5: GR, ME dropped.
6. Equation 6: FR, NZ dropped.
7. Equation 7: KO dropped.
8. Equation 8: PA dropped.
9. Equation 9: SO, VE, JO dropped.
10. Equation 11: NO, GR, IR, PO, JO, SY, AR, CE, PE dropped.
11. Equation 12: equation eliminated; 7 equations dropped.
12. Equation 14: CA, AU, GE, UK, DE dropped.
13. Equation 15: equation eliminated; 12 equations dropped.

After reestimation and further tests, these equations did not seem reliable, and so they were dropped.

No new explanatory variables have been introduced in any of the equations. In some cases a variable that was originally lagged once is now unlagged, and in some

cases a variable that was originally unlagged is now lagged once. Also, in some cases a variable that was originally excluded from the equation is now included and vice versa. These are all minor changes. If you want to see exactly the changes, you can compare Table B.4 in Fair (2004, pp. 252–282) with Table B.4 in Appendix B of the MCF model. In a few cases an equation that was originally estimated by 2SLS is now estimated by OLS. The equations that are estimated by 2SLS are the ones in Table B.4 in which the overidentification test is performed. Finally, in the MCF model the base year is 2005 rather than 1995 as in the original model. All variables that had "95" in their name now have "00" instead. (To be consistent with the 2005 base year, the names should use "05" rather than "00," but this was not done because it is a pain to change so many variable names—the "00" notation was started for the MCD model.)

US Model Changes Since 2004

The following are the specification changes that have been made to the US model since 2004.

1. Equation 9, which explains MH, has been dropped. The recent data on MH, which are from the Flow of Funds accounts, are not sensible, and so MH has simply been taken to be exogenous.

2. In equation 14, which explains HF, the time trend T has been added.

3. In equation 17, which explains MF, the interest rate variable is unlagged rather than lagged once. Also, the dummy variable $D981$ has been dropped.

4. Equation 20, which explains IVA, has been dropped. The values of IVA since 2007:4 have been extreme, and it does not seem possible to explain them. IVA has thus been taken to be exogenous.

5. In equation 21, which explains CCF, some of the dummy variables have been changed and some new dummy variables have been added to try to account for different tax law changes.

6. Equation 22, which explains BO, has been dropped. Similar to the case for IVA, the values of BO since 2007:4 have been extreme, and it does not seem possible to explain them. BO has thus been taken to be exogenous. This means that exogenous variable RD is no longer used in the model.

7. Equation 27, which explains IM, is estimated under the assumption of no serial correlation of the error term.

8. Equation 57, which explains BR, has been dropped, and BR has been taken to be exogenous. This means that exogenous variable $G1$ is no longer used in the model. Dropping this equation means that BR is no longer tied to MB; it is simply exogenous. As with BO, the values of BR since 2007:4 have been extreme, and it does not seem possible to explain them.

9. Variables PKH and $PSI14$ have been added, and in equation 89, which determines the wealth variable, AA, PIH has been replaced with PKH. $PKH{\cdot}KH$ is a better measure of housing wealth than is $PIH{\cdot}KH$. PKH is the market price of KH. It is based on data from the Flow of Funds accounts. $PKH \cdot KH$ is the market value of the stock of housing, KH. PKH is explained by a new equation, equation 55, which is $PKH = PSI14 \cdot PD$, where $PSI14$ is taken to be exogenous. Relative housing price changes are thus reflected in changes in $PSI14$.

10. Three new exogenous variables have been added to reflect NIPA data changes, $TAXFR$, $TRFG$, and $TRFS$. The three new exogenous variables required changes to the identities 67, 68, 69, 74, 76, 78, 105, and 112.

11. A new exogenous variable, $CTGB$, has been added. It is the value of capital transfers from the federal government to financial business. It appears in equations 73 and 77. This variable reflects the government's estimates of the eventual cost to the government of the bail out activity.

12. In equations 47, 48, 90, 91, and 99, POP has been replaced with $(POP \cdot PH)$. This change ties the progressivity of the personal income tax system to real per capita income rather than nominal per capita income.

The extensive NIPA revisions released in August 2009 led to three variables being dropped, DRS, $INTOTH$, and $INTROW$, and four variables being added, DG, DR, DS, and $INTZ$. No stochastic equations were changed, but changes were made to ten identities.

1. Equation 64: $INTZ$ replaces $INTOTH+INTROW$, and $DG+DR+DS$ replaces $-DRS$.

2. Equation 67: $INTZ$ replaces $INTOTH + INTROW$.

3. Equation 68: $INTZ$ replaces $INTOTH+INTROW$, and $-DR$ is added.

4. Equation 76: $-DG$ is added.

5. Equation 78: DS replaces $-DRS$.

6. Equation 99: $INTZ$ replaces $INTOTH+INTROW$, and $DG+DR+DS$ replaces $-DRS$.
7. Equation 105: $-DG$ is added.
8. Equation 112: $-DS$ is added.
9. Equation 113: $-DRS$ is dropped.
10. Equation 115: $INTZ$ replaces $INTOTH + INTROW$, and $DG + DR + DS$ replaces $-DRS$.

Beginning with the October 31, 2009, forecast of the US model the forecast horizon was lengthened to about 11 years. In the process of doing this most of the exogenous nominal variables were tied to the GDP deflator. To be precise, for an exogenous nominal variable y a real variable x was created as y/p where p is the GDP deflator. Then x was treated as exogenous, and the equation $y = p * x$ was added to the model. A "Q" was added at the end of a name of an exogenous nominal variable to denote that the variable is real. The extra equations are:

$$
\begin{aligned}
CCG &= CCGQ \cdot GDPD \\
CCH &= CCHQ \cdot GDPD \\
CCS &= CCSQ \cdot GDPD \\
DB &= DBQ \cdot GDPD \\
DG &= DGQ \cdot GDPD \\
DR &= DRQ \cdot GDPD \\
DS &= DSQ \cdot GDPD \\
IGZ &= IGZQ \cdot GDPD \\
INS &= INSQ \cdot GDPD \\
INTZ &= INTZQ \cdot GDPD \\
INTS &= INTSQ \cdot GDPD \\
ISZ &= ISZQ \cdot GDPD \\
IVA &= IVAQ \cdot GDPD \\
MG &= MGQ \cdot GDPD \\
MH &= MHQ \cdot GDPD \\
MR &= MRQ \cdot GDPD \\
MS &= MSQ \cdot GDPD \\
Q &= QQ \cdot GDPD \\
RNT &= RNTQ \cdot GDPD \\
SIFS &= SIFSQ \cdot GDPD \\
SIGG &= SIGGQ \cdot GDPD
\end{aligned}
$$

$SIHS = SIHSQ \cdot GDPD$
$SISS = SISSQ \cdot GDPD$
$SUBG = SUBGQ \cdot GDPD$
$SUBS = SUBSQ \cdot GDPD$
$TAXFR = TAXFRQ \cdot GDPD$
$TBG = TBGQ \cdot GDPD$
$TBS = TBSQ \cdot GDPD$
$TRFG = TRFGQ \cdot GDPD$
$TRFH = TRFHQ \cdot GDPD$
$TRFR = TRFRQ \cdot GDPD$
$TRFS = TRFSQ \cdot GDPD$
$TRGH = TRGHQ \cdot GDPD$
$TRGR = TRGRQ \cdot GDPD$
$TRGS = TRGSQ \cdot GDPD$
$TRHR = TRHRQ \cdot GDPD$
$TRSH = TRSHQ \cdot GDPD$

In addition, $THETA1$ was defined as $FIROWD/GDPD$, $THETA2$ as $FIUSD/GDPD$, and $THETA3$ as $PFA/GDPD$. The following equations were then added:

$FIROWD = THETA1 \cdot GDPD$
$FIROW = FIROWD \cdot FIROWR$
$FIUSD = THETA2 \cdot GDPD$
$FIUS = FIUSD \cdot FIUSR$
$PFA = THETA3 \cdot GDPD$

Finally, nine variables were added to the list of variables that can be examined using the output part of the web software.

$RECGZGDP = RECG/GDP$
$EXPGZGDP = EXPG/GDP$
$SGPZGDP = -SGP/GDP$
$AGZGDP = -AG/(4 \cdot GDP)$
$INTGZGDP = INTG/GDP$
$ASZGDP = -AS/(4 \cdot GDP)$
$SRZGDP = SR/GDP$
$PCGDPR4 = 100 \cdot (GDPR/GDPR(-4) - 1)$
$PCGDPD4 = 100 \cdot (GDPD/GDPD(-4) - 1)$

1.3 Trade Share Equations

There are 1,319 estimated trade share equations in the MCF model. a_{ijt} is the fraction of country i's exports imported from j in quarter t. For each i, j trade share equation, the left hand side variable is $\log(a_{ijt} + .00001)$. The three right hand side variables are the constant, $\log(a_{ijt-1} + .00001)$, and $PX\$_{it}/(\sum_{k=1}^{58} a_{kjt-1} PX\$_{kt})$. The summation for the third variable excludes the oil exporting countries, which are SA, VE, NI, AL, IA, IN, IQ, KU, LI, UA. Also, an element in the summation is skipped if $k = j$. Trade share equations are not estimated (i.e., trade shares are taken to be exogenous) for the exports of oil exporting countries. See Fair (2004, pp. 57–58) for further discussion of the trade share equations.

Chapter 2

The MCF Model on the Website

This chapter discusses practical things you should know when working with the MCF model. It relies on Chapter 2 in Fair (2004) and on the MCF model Appendices A and B on the website. If you are planning to work with the MCF model, it may be helpful to have hard copies of these items available for ease of reference. In what follows all references to chapters and tables are to those in Fair (2004) or in the MCF model Appendices A and B on the website.

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 five choices you can make regarding the solution of the MCF model.

1. The prediction period, where the default is 2011-2020.

2. Whether you want the entire MCF model solved or just the individual country models by themselves. If you choose the latter, none of the variables in one country affect the variables in any other country. Each individual country model stands alone, and all foreign-sector variables in an individual country model are taken to be exogenous. The default is to solve the entire MCF model.

3. Whether or not you want the trade share equations used. If you do not want the trade share equations used, the trade shares are taken to be exogenous and equal to the actual values prior to 2010:1 and to the predicted values in the base dataset (MCFBASE) from 2010:1 on. This trade share option is not relevant if you choose to have the individual country models solved by themselves since in this case the output from the trade share calculations does not affect any individual country model. The default is to use the trade share equations.

4. 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.

5. 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 size of the model is discussed in Section 2.1 in Chapter 2 in Fair (2004), and the way in which the model is solved is discussed in Section B.6 in Appendix B. Because the MCF 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 307 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 2011:2 when the basic prediction period is 2011-2020.

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 1,368 coefficients in the equations. Unlike for the US model alone, however, you cannot add variables to the equations.

2.4 Creating Base Datasets

If you ask the program to solve the MCF model for any period beginning 2011 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 MCFBASE. If, on the other hand, you ask the program to solve the model for a period beginning earlier than 2011, where at least some actual data exist, the solution values will not be the same as the values in MCFBASE 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 MCFBASE when you make no changes to the exogenous variables and coefficients is when you are solving beginning 2011 or later.

If you want to work with the MCF 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 features 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

This chapter presents the experiments that are reported in the appendix in Fair (2009), "Has Macro Progressed?" The prediction period is 2000:1–2005:4. If you do the following experiments using the MCE model on the website, you will exactly duplicate the results reported in the appendix in this paper. This will not be true for the MCF model since the MCE and MCF models differ somewhat.

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 peaks after four quarters at about 1.9 percent of real GDP. Table 3.1 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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, which we will call 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".

Table 3.1
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	1.07	0.09	0.02	1.86	0.17	-0.01	0.19	0.07	-0.05	-0.01	-0.25	-0.25
2000.2	1.65	0.19	0.06	3.27	0.44	-0.02	0.47	0.15	-0.09	-0.03	-0.53	-0.32
2000.3	1.83	0.32	0.11	4.12	0.75	-0.04	0.67	0.25	-0.14	-0.06	-0.74	-0.28
2000.4	1.87	0.46	0.14	4.91	1.09	-0.06	0.76	0.37	-0.18	-0.09	-0.87	-0.20
2001.1	1.82	0.56	0.16	5.48	1.42	-0.10	0.79	0.44	-0.27	-0.11	-0.92	-0.08
2001.2	1.75	0.70	0.16	5.73	1.71	-0.13	0.79	0.55	-0.28	-0.13	-0.91	0.06
2001.3	1.66	0.78	0.16	5.77	1.94	-0.15	0.78	0.62	-0.29	-0.15	-0.87	0.22
2001.4	1.56	0.84	0.15	5.59	2.10	-0.18	0.75	0.68	-0.28	-0.16	-0.81	0.37
2002.1	1.47	0.90	0.14	5.43	2.20	-0.19	0.73	0.72	-0.26	-0.17	-0.77	0.56
2002.2	1.37	0.93	0.12	5.04	2.23	-0.20	0.69	0.75	-0.23	-0.19	-0.70	0.74
2002.3	1.28	0.96	0.10	4.58	2.22	-0.21	0.65	0.78	-0.20	-0.19	-0.65	0.94
2002.4	1.21	0.97	0.08	4.15	2.16	-0.21	0.59	0.80	-0.15	-0.19	-0.56	1.15
2003.1	1.16	0.98	0.07	3.71	2.07	-0.20	0.55	0.81	-0.07	-0.19	-0.52	1.37
2003.2	1.11	0.98	0.06	3.24	1.96	-0.20	0.53	0.82	-0.03	-0.17	-0.49	1.56
2003.3	1.08	0.97	0.05	2.80	1.84	-0.19	0.49	0.81	0.00	-0.16	-0.43	1.75
2003.4	1.06	0.96	0.05	2.42	1.72	-0.18	0.46	0.81	0.04	-0.15	-0.42	1.96
2004.1	1.03	0.96	0.05	2.10	1.59	-0.17	0.45	0.81	0.12	-0.15	-0.40	2.17
2004.2	1.02	0.95	0.05	1.81	1.47	-0.15	0.42	0.81	0.15	-0.13	-0.38	2.36
2004.3	1.02	0.94	0.06	1.58	1.36	-0.14	0.40	0.81	0.17	-0.12	-0.36	2.56
2004.4	1.02	0.94	0.08	1.41	1.27	-0.13	0.38	0.81	0.18	-0.10	-0.36	2.76
2005.1	1.04	0.94	0.09	1.27	1.18	-0.12	0.39	0.82	0.22	-0.09	-0.36	2.93
2005.2	1.05	0.94	0.11	1.14	1.12	-0.12	0.40	0.82	0.22	-0.08	-0.38	3.13
2005.3	1.05	0.94	0.13	1.01	1.06	-0.12	0.40	0.82	0.22	-0.07	-0.38	3.32
2005.4	1.06	0.93	0.15	0.93	1.02	-0.12	0.39	0.82	0.24	-0.06	-0.38	3.52

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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 peaks after six quarters at about 0.9 percent of real GDP. Table 3.2 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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, which we will call 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".

Table 3.2
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	0.21	0.02	0.14	1.20	0.16	0.00	0.04	0.01	-0.01	-0.02	-0.05	0.16
2000.2	0.46	0.05	0.28	2.25	0.42	0.00	0.12	0.04	-0.02	-0.06	-0.14	0.28
2000.3	0.66	0.10	0.39	3.10	0.75	-0.01	0.21	0.08	-0.03	-0.12	-0.24	0.41
2000.4	0.80	0.17	0.49	3.77	1.10	-0.01	0.29	0.14	-0.04	-0.17	-0.33	0.54
2001.1	0.87	0.23	0.57	4.30	1.47	-0.02	0.35	0.18	-0.08	-0.21	-0.40	0.70
2001.2	0.91	0.31	0.64	4.70	1.81	-0.03	0.38	0.25	-0.08	-0.24	-0.44	0.87
2001.3	0.91	0.37	0.69	4.91	2.12	-0.03	0.41	0.30	-0.08	-0.27	-0.46	1.06
2001.4	0.88	0.42	0.72	4.94	2.38	-0.04	0.41	0.35	-0.08	-0.29	-0.46	1.25
2002.1	0.83	0.47	0.75	4.93	2.58	-0.03	0.41	0.39	-0.06	-0.32	-0.45	1.46
2002.2	0.75	0.51	0.76	4.66	2.73	-0.03	0.40	0.42	-0.04	-0.36	-0.42	1.69
2002.3	0.67	0.54	0.77	4.29	2.81	-0.02	0.38	0.45	-0.01	-0.38	-0.38	1.93
2002.4	0.60	0.56	0.77	3.91	2.85	-0.02	0.34	0.47	0.02	-0.40	-0.33	2.17
2003.1	0.54	0.57	0.77	3.50	2.84	0.02	0.31	0.49	0.10	-0.41	-0.29	2.42
2003.2	0.49	0.57	0.76	3.03	2.80	0.03	0.29	0.49	0.13	-0.40	-0.26	2.66
2003.3	0.45	0.57	0.76	2.60	2.73	0.05	0.26	0.50	0.17	-0.39	-0.22	2.88
2003.4	0.40	0.57	0.75	2.21	2.64	0.07	0.23	0.50	0.20	-0.39	-0.19	3.12
2004.1	0.37	0.57	0.75	1.90	2.54	0.11	0.22	0.50	0.28	-0.40	-0.17	3.36
2004.2	0.34	0.56	0.75	1.58	2.44	0.13	0.20	0.51	0.31	-0.40	-0.15	3.59
2004.3	0.33	0.56	0.75	1.34	2.34	0.16	0.18	0.50	0.34	-0.39	-0.13	3.83
2004.4	0.32	0.55	0.75	1.14	2.24	0.18	0.17	0.50	0.35	-0.38	-0.12	4.05
2005.1	0.33	0.55	0.75	1.01	2.15	0.22	0.17	0.50	0.40	-0.37	-0.12	4.26
2005.2	0.34	0.54	0.76	0.91	2.08	0.23	0.18	0.51	0.40	-0.36	-0.13	4.50
2005.3	0.36	0.54	0.77	0.83	2.02	0.25	0.18	0.51	0.42	-0.36	-0.15	4.71
2005.4	0.37	0.55	0.78	0.79	1.97	0.26	0.18	0.51	0.43	-0.35	-0.15	4.94

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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 experiment 3.2 is similar to the output multiplier of the transfer payment increase. Table 3.3 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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".

Table 3.3
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	0.20	0.01	0.13	1.18	0.15	0.00	0.02	0.01	-0.01	-0.02	-0.03	0.16
2000.2	0.43	0.04	0.25	2.11	0.39	0.00	0.09	0.03	-0.01	-0.06	-0.10	0.30
2000.3	0.61	0.08	0.35	2.86	0.69	0.00	0.16	0.07	-0.02	-0.11	-0.18	0.44
2000.4	0.73	0.14	0.45	3.47	1.01	-0.01	0.23	0.11	-0.03	-0.16	-0.26	0.59
2001.1	0.80	0.18	0.53	3.96	1.34	-0.01	0.28	0.15	-0.06	-0.20	-0.31	0.76
2001.2	0.85	0.26	0.60	4.35	1.66	-0.02	0.31	0.21	-0.06	-0.23	-0.35	0.94
2001.3	0.86	0.30	0.65	4.58	1.95	-0.02	0.32	0.25	-0.06	-0.26	-0.37	1.14
2001.4	0.84	0.35	0.69	4.66	2.20	-0.03	0.33	0.29	-0.05	-0.28	-0.36	1.33
2002.1	0.80	0.38	0.72	4.70	2.40	-0.01	0.33	0.32	-0.03	-0.31	-0.36	1.54
2002.2	0.74	0.42	0.74	4.50	2.55	-0.01	0.32	0.35	-0.01	-0.35	-0.33	1.76
2002.3	0.68	0.44	0.75	4.20	2.65	0.00	0.30	0.37	0.02	-0.38	-0.30	2.00
2002.4	0.62	0.46	0.76	3.90	2.71	0.01	0.26	0.39	0.05	-0.39	-0.25	2.25
2003.1	0.58	0.46	0.77	3.57	2.73	0.04	0.24	0.40	0.12	-0.41	-0.22	2.49
2003.2	0.54	0.47	0.77	3.17	2.72	0.06	0.22	0.41	0.15	-0.41	-0.19	2.72
2003.3	0.50	0.46	0.77	2.80	2.68	0.08	0.19	0.41	0.19	-0.40	-0.15	2.93
2003.4	0.46	0.46	0.78	2.44	2.62	0.09	0.16	0.41	0.22	-0.41	-0.13	3.17
2004.1	0.43	0.45	0.78	2.16	2.55	0.14	0.15	0.41	0.29	-0.42	-0.10	3.40
2004.2	0.41	0.45	0.78	1.86	2.47	0.17	0.13	0.41	0.32	-0.43	-0.08	3.63
2004.3	0.39	0.44	0.78	1.62	2.39	0.19	0.11	0.41	0.35	-0.43	-0.06	3.86
2004.4	0.38	0.43	0.78	1.43	2.30	0.21	0.09	0.40	0.37	-0.42	-0.05	4.09
2005.1	0.39	0.42	0.79	1.29	2.23	0.26	0.09	0.40	0.42	-0.41	-0.04	4.29
2005.2	0.40	0.42	0.79	1.18	2.16	0.27	0.09	0.40	0.42	-0.41	-0.05	4.53
2005.3	0.41	0.41	0.80	1.10	2.11	0.30	0.09	0.40	0.44	-0.41	-0.05	4.74
2005.4	0.42	0.41	0.82	1.05	2.07	0.31	0.09	0.40	0.45	-0.41	-0.06	4.97

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

3.4 RS Increase

This experiment shows that the output multiplier of an interest rate increase of 1.0 percentage points peaks in absolute value after ten quarters at about -0.8 percent of real GDP. Table 3.4 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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".

Table 3.4
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	-0.05	-0.02	-0.07	-0.05	-0.02	-0.01	1.00	-0.06	-0.25	0.04	0.01	0.03
2000.2	-0.15	-0.05	-0.15	-0.40	-0.09	-0.02	1.00	-0.10	-0.34	0.07	0.04	0.10
2000.3	-0.27	-0.09	-0.23	-0.90	-0.21	-0.04	1.00	-0.15	-0.42	0.10	0.09	0.18
2000.4	-0.39	-0.14	-0.31	-1.41	-0.37	-0.06	1.00	-0.21	-0.50	0.13	0.15	0.27
2001.1	-0.50	-0.21	-0.38	-1.92	-0.56	-0.07	1.00	-0.31	-0.73	0.18	0.21	0.37
2001.2	-0.59	-0.29	-0.44	-2.44	-0.77	-0.10	1.00	-0.39	-0.79	0.20	0.26	0.48
2001.3	-0.67	-0.37	-0.50	-2.93	-1.00	-0.11	1.00	-0.47	-0.86	0.23	0.31	0.59
2001.4	-0.73	-0.45	-0.55	-3.39	-1.23	-0.13	1.00	-0.55	-0.92	0.24	0.35	0.70
2002.1	-0.77	-0.54	-0.60	-3.81	-1.45	-0.14	1.00	-0.66	-1.11	0.30	0.38	0.81
2002.2	-0.79	-0.64	-0.63	-4.06	-1.66	-0.15	1.00	-0.75	-1.16	0.34	0.40	0.92
2002.3	-0.78	-0.72	-0.66	-4.21	-1.85	-0.16	1.00	-0.83	-1.20	0.37	0.41	1.01
2002.4	-0.77	-0.80	-0.68	-4.33	-2.01	-0.18	1.00	-0.91	-1.25	0.40	0.40	1.12
2003.1	-0.76	-0.88	-0.70	-4.34	-2.14	-0.21	1.00	-1.00	-1.41	0.43	0.39	1.20
2003.2	-0.73	-0.95	-0.70	-4.19	-2.23	-0.24	1.00	-1.07	-1.46	0.43	0.38	1.30
2003.3	-0.70	-1.01	-0.70	-3.96	-2.29	-0.27	1.00	-1.13	-1.53	0.44	0.35	1.36
2003.4	-0.65	-1.06	-0.69	-3.71	-2.32	-0.28	1.00	-1.18	-1.56	0.46	0.33	1.43
2004.1	-0.60	-1.12	-0.67	-3.46	-2.31	-0.33	1.00	-1.24	-1.68	0.47	0.30	1.48
2004.2	-0.54	-1.16	-0.66	-3.11	-2.28	-0.36	1.00	-1.28	-1.73	0.49	0.26	1.54
2004.3	-0.49	-1.19	-0.63	-2.78	-2.22	-0.40	1.00	-1.31	-1.74	0.47	0.22	1.59
2004.4	-0.44	-1.21	-0.61	-2.44	-2.13	-0.43	1.00	-1.34	-1.76	0.47	0.18	1.62
2005.1	-0.40	-1.23	-0.58	-2.09	-2.03	-0.50	1.00	-1.37	-1.84	0.45	0.15	1.66
2005.2	-0.35	-1.25	-0.54	-1.75	-1.91	-0.54	1.00	-1.38	-1.88	0.43	0.13	1.70
2005.3	-0.31	-1.26	-0.51	-1.42	-1.77	-0.59	1.00	-1.39	-1.90	0.41	0.10	1.73
2005.4	-0.27	-1.26	-0.48	-1.11	-1.63	-0.63	1.00	-1.40	-1.91	0.39	0.08	1.76

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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. Table 3.5 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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, which we will call 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".

Table 3.5
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000.2	0.05	0.01	0.08	0.09	0.04	0.00	0.02	0.00	0.00	-0.01	-0.03	-0.02
2000.3	0.14	0.02	0.15	0.34	0.12	0.00	0.06	0.02	-0.01	-0.02	-0.07	-0.07
2000.4	0.21	0.04	0.21	0.59	0.23	0.00	0.10	0.03	-0.02	-0.03	-0.11	-0.11
2001.1	0.27	0.07	0.26	0.86	0.36	-0.01	0.14	0.05	-0.04	-0.05	-0.16	-0.16
2001.2	0.31	0.10	0.30	1.00	0.50	-0.01	0.17	0.08	-0.05	-0.06	-0.19	-0.20
2001.3	0.33	0.13	0.33	1.11	0.62	-0.02	0.19	0.10	-0.05	-0.07	-0.22	-0.23
2001.4	0.32	0.16	0.36	1.16	0.74	-0.02	0.21	0.13	-0.06	-0.08	-0.23	-0.26
2002.1	0.31	0.19	0.37	1.18	0.84	-0.02	0.22	0.15	-0.07	-0.09	-0.24	-0.28
2002.2	0.28	0.22	0.38	1.11	0.91	-0.03	0.22	0.17	-0.06	-0.11	-0.24	-0.30
2002.3	0.25	0.24	0.38	1.00	0.97	-0.03	0.22	0.19	-0.06	-0.11	-0.24	-0.31
2002.4	0.23	0.26	0.39	0.88	1.00	-0.03	0.21	0.21	-0.05	-0.12	-0.22	-0.32
2003.1	0.21	0.27	0.39	0.75	1.02	-0.03	0.21	0.22	-0.04	-0.12	-0.22	-0.33
2003.2	0.19	0.29	0.38	0.60	1.03	-0.03	0.21	0.24	-0.03	-0.12	-0.21	-0.34
2003.3	0.16	0.30	0.37	0.45	1.01	-0.03	0.20	0.25	-0.01	-0.12	-0.19	-0.34
2003.4	0.13	0.31	0.36	0.30	0.99	-0.02	0.19	0.25	0.00	-0.12	-0.18	-0.33
2004.1	0.11	0.31	0.35	0.15	0.95	-0.01	0.18	0.26	0.03	-0.12	-0.17	-0.32
2004.2	0.08	0.32	0.33	0.01	0.90	-0.01	0.17	0.27	0.04	-0.12	-0.15	-0.31
2004.3	0.06	0.32	0.32	-0.12	0.84	0.00	0.15	0.27	0.06	-0.11	-0.14	-0.30
2004.4	0.04	0.32	0.30	-0.22	0.78	0.00	0.14	0.27	0.07	-0.10	-0.13	-0.29
2005.1	0.03	0.32	0.29	-0.30	0.72	0.01	0.13	0.28	0.10	-0.09	-0.12	-0.28
2005.2	0.03	0.32	0.27	-0.38	0.66	0.01	0.13	0.28	0.10	-0.08	-0.12	-0.27
2005.3	0.02	0.32	0.26	-0.44	0.60	0.02	0.13	0.28	0.11	-0.07	-0.11	-0.26
2005.4	0.01	0.32	0.25	-0.50	0.55	0.02	0.12	0.28	0.12	-0.06	-0.11	-0.25

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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. Table 3.6 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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 third 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".

Table 3.6
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	-0.02	0.50	0.00	-0.05	0.02	-0.05	0.00	0.45	0.10	0.07	0.00	-0.18
2000.2	-0.05	0.97	-0.02	-0.15	0.06	-0.09	0.00	0.86	0.14	0.15	0.02	-0.33
2000.3	-0.10	1.39	-0.05	-0.23	0.09	-0.14	0.00	1.24	0.20	0.21	0.04	-0.46
2000.4	-0.15	1.78	-0.08	-0.28	0.13	-0.19	0.00	1.59	0.27	0.27	0.06	-0.57
2001.1	-0.20	2.15	-0.12	-0.33	0.14	-0.31	0.00	1.95	0.49	0.27	0.09	-0.68
2001.2	-0.25	2.49	-0.17	-0.35	0.15	-0.37	0.00	2.25	0.57	0.29	0.12	-0.76
2001.3	-0.30	2.80	-0.23	-0.42	0.15	-0.42	0.00	2.53	0.66	0.31	0.15	-0.84
2001.4	-0.35	3.08	-0.28	-0.51	0.13	-0.49	0.00	2.79	0.76	0.31	0.18	-0.91
2002.1	-0.41	3.34	-0.33	-0.67	0.08	-0.60	0.00	3.06	1.01	0.32	0.21	-0.95
2002.2	-0.47	3.58	-0.38	-0.81	0.03	-0.67	0.00	3.27	1.09	0.37	0.25	-1.00
2002.3	-0.51	3.79	-0.43	-0.94	-0.04	-0.70	0.00	3.47	1.17	0.41	0.28	-1.03
2002.4	-0.56	3.99	-0.48	-1.10	-0.11	-0.74	0.00	3.65	1.25	0.45	0.31	-1.06
2003.1	-0.61	4.18	-0.53	-1.30	-0.20	-0.86	0.00	3.85	1.48	0.45	0.34	-1.06
2003.2	-0.65	4.35	-0.57	-1.45	-0.30	-0.90	0.00	4.01	1.56	0.48	0.37	-1.11
2003.3	-0.68	4.51	-0.61	-1.58	-0.40	-0.92	0.00	4.16	1.65	0.51	0.39	-1.11
2003.4	-0.71	4.65	-0.64	-1.69	-0.49	-0.98	0.00	4.29	1.71	0.55	0.41	-1.12
2004.1	-0.74	4.78	-0.66	-1.82	-0.58	-1.07	0.00	4.44	1.89	0.57	0.43	-1.10
2004.2	-0.75	4.91	-0.69	-1.87	-0.67	-1.07	0.00	4.55	1.95	0.62	0.44	-1.11
2004.3	-0.76	5.03	-0.71	-1.90	-0.74	-1.12	0.00	4.66	1.98	0.67	0.44	-1.12
2004.4	-0.76	5.13	-0.72	-1.92	-0.80	-1.14	0.00	4.76	2.01	0.74	0.44	-1.12
2005.1	-0.77	5.24	-0.73	-1.91	-0.85	-1.17	0.00	4.87	2.15	0.72	0.44	-1.11
2005.2	-0.77	5.34	-0.73	-1.90	-0.89	-1.20	0.00	4.97	2.18	0.75	0.44	-1.11
2005.3	-0.77	5.44	-0.74	-1.88	-0.91	-1.24	0.00	5.06	2.22	0.80	0.44	-1.11
2005.4	-0.76	5.52	-0.74	-1.87	-0.93	-1.27	0.00	5.13	2.26	0.85	0.43	-1.11

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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. Table 3.7 presents selected results for the United States from this experiment. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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".

Table 3.7
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.1	-0.04	0.52	-0.15	-0.75	-0.65	0.65	0.45	1.50	8.38	-1.29	0.00	-0.15
2000.2	-0.15	0.87	-0.34	-1.47	-1.26	0.97	0.60	1.80	8.30	-1.06	0.03	-0.19
2000.3	-0.24	1.17	-0.51	-1.89	-1.81	1.20	0.49	2.05	8.22	-0.83	0.08	-0.22
2000.4	-0.29	1.44	-0.65	-2.09	-2.29	1.36	0.39	2.29	8.19	-0.66	0.12	-0.25
2001.1	-0.29	1.68	-0.77	-2.08	-2.70	1.68	0.39	2.49	8.22	-0.47	0.14	-0.30
2001.2	-0.28	1.89	-0.87	-1.92	-3.02	1.79	0.41	2.67	8.15	-0.30	0.15	-0.32
2001.3	-0.30	2.09	-0.95	-1.94	-3.29	1.86	0.40	2.85	8.15	-0.19	0.16	-0.34
2001.4	-0.31	2.26	-1.00	-1.92	-3.50	1.93	0.37	3.01	8.08	-0.09	0.17	-0.36
2002.1	-0.30	2.43	-1.05	-1.90	-3.67	1.97	0.36	3.14	8.00	-0.03	0.18	-0.37
2002.2	-0.27	2.58	-1.09	-1.80	-3.79	2.01	0.36	3.26	7.90	0.01	0.17	-0.40
2002.3	-0.24	2.72	-1.12	-1.68	-3.87	1.99	0.36	3.38	7.87	0.07	0.17	-0.40
2002.4	-0.23	2.84	-1.14	-1.59	-3.93	1.92	0.35	3.48	7.77	0.09	0.16	-0.42
2003.1	-0.24	2.94	-1.16	-1.49	-3.96	1.89	0.32	3.55	7.59	0.15	0.16	-0.40
2003.2	-0.24	3.03	-1.16	-1.35	-3.96	1.87	0.29	3.62	7.56	0.17	0.16	-0.42
2003.3	-0.22	3.11	-1.15	-1.22	-3.94	1.81	0.27	3.69	7.50	0.19	0.15	-0.41
2003.4	-0.19	3.19	-1.15	-1.08	-3.90	1.70	0.26	3.75	7.41	0.18	0.15	-0.41
2004.1	-0.17	3.25	-1.13	-0.96	-3.84	1.61	0.25	3.80	7.28	0.23	0.14	-0.40
2004.2	-0.13	3.31	-1.11	-0.80	-3.77	1.54	0.24	3.83	7.17	0.23	0.12	-0.41
2004.3	-0.11	3.36	-1.09	-0.67	-3.68	1.52	0.23	3.87	7.12	0.25	0.11	-0.41
2004.4	-0.09	3.41	-1.07	-0.56	-3.59	1.41	0.22	3.91	7.05	0.20	0.09	-0.40
2005.1	-0.09	3.45	-1.04	-0.48	-3.49	1.25	0.21	3.93	6.94	0.21	0.09	-0.39
2005.2	-0.09	3.48	-1.01	-0.40	-3.39	1.18	0.19	3.95	6.89	0.20	0.09	-0.38
2005.3	-0.09	3.50	-0.98	-0.34	-3.29	1.13	0.16	3.96	6.79	0.21	0.09	-0.35
2005.4	-0.07	3.53	-0.96	-0.29	-3.19	1.05	0.14	3.97	6.70	0.16	0.08	-0.35

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 4

Experiments in *Estimating How the Macroeconomy Works*

This chapter presents some of the experiments in Fair (2004), *Estimating How the Macroeconomy Works*. If you do the following experiments using the MCA model on the website, you will exactly duplicate the results in this book. This will not be true for the MCF model since the MCA and MCF models differ somewhat.

4.1 Testing for a New Economy in the 1990s (Chapter 6)

This section explains how to perform the "no stock market boom" experiment in Chapter 6. It assumes that Chapter 6 has been read. Table 4.1 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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 131.2. 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".

Table 4.1
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1995.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995.2	-0.04	0.00	-0.06	-0.08	-0.03	0.00	-0.01	0.00	0.00	0.00	0.02	0.02
1995.3	-0.13	-0.02	-0.15	-0.36	-0.11	0.00	-0.05	-0.01	0.01	0.01	0.06	0.08
1995.4	-0.27	-0.06	-0.30	-0.82	-0.27	0.00	-0.12	-0.05	0.02	0.03	0.14	0.18
1996.1	-0.47	-0.12	-0.48	-1.48	-0.52	0.01	-0.22	-0.09	0.06	0.05	0.25	0.34
1996.2	-0.67	-0.20	-0.67	-2.18	-0.86	0.02	-0.34	-0.16	0.08	0.08	0.38	0.52
1996.3	-0.86	-0.28	-0.85	-2.87	-1.25	0.03	-0.46	-0.22	0.10	0.13	0.52	0.70
1996.4	-0.99	-0.41	-0.99	-3.45	-1.66	0.05	-0.57	-0.33	0.12	0.17	0.64	0.88
1997.1	-1.09	-0.53	-1.14	-3.86	-2.09	0.07	-0.67	-0.43	0.17	0.21	0.75	1.04
1997.2	-1.13	-0.62	-1.25	-4.11	-2.50	0.09	-0.75	-0.50	0.18	0.26	0.84	1.17
1997.3	-1.23	-0.75	-1.48	-4.28	-2.94	0.11	-0.86	-0.61	0.18	0.31	0.95	1.34
1997.4	-1.41	-0.89	-1.76	-4.80	-3.44	0.13	-0.99	-0.73	0.18	0.37	1.08	1.56
1998.1	-1.59	-1.04	-2.00	-5.32	-3.98	0.15	-1.11	-0.85	0.22	0.42	1.21	1.80
1998.2	-1.82	-1.21	-2.33	-5.87	-4.59	0.17	-1.26	-0.99	0.22	0.49	1.37	2.09
1998.3	-2.03	-1.40	-2.59	-6.45	-5.23	0.20	-1.42	-1.15	0.24	0.54	1.53	2.36
1998.4	-2.00	-1.58	-2.60	-6.52	-5.74	0.22	-1.52	-1.30	0.22	0.60	1.62	2.52
1999.1	-2.01	-1.75	-2.83	-6.41	-6.25	0.22	-1.63	-1.41	0.38	0.64	1.75	2.68
1999.2	-2.04	-1.91	-3.02	-6.39	-6.73	0.24	-1.69	-1.55	0.37	0.72	1.78	2.86
1999.3	-2.09	-2.07	-3.26	-6.21	-7.19	0.26	-1.76	-1.69	0.35	0.80	1.86	3.03
1999.4	-2.10	-2.24	-3.36	-6.31	-7.61	0.25	-1.84	-1.84	0.30	0.87	1.92	3.17
2000.1	-2.19	-2.40	-3.66	-6.07	-8.04	0.23	-1.91	-1.98	0.25	0.98	1.97	3.39
2000.2	-2.37	-2.58	-4.00	-6.32	-8.54	0.23	-2.02	-2.14	0.20	1.07	2.10	3.58
2000.3	-2.45	-2.76	-4.16	-6.47	-9.01	0.25	-2.13	-2.31	0.14	1.19	2.20	3.80
2000.4	-2.46	-2.96	-4.25	-6.42	-9.42	0.26	-2.29	-2.48	0.09	1.23	2.38	3.99
2001.1	-2.28	-3.12	-4.14	-5.76	-9.65	0.24	-2.30	-2.61	0.07	1.21	2.34	4.13
2001.2	-1.90	-3.25	-3.86	-4.36	-9.63	0.24	-2.18	-2.74	-0.03	1.13	2.20	4.08
2001.3	-1.51	-3.32	-3.65	-2.70	-9.41	0.20	-2.03	-2.79	-0.07	1.03	2.04	4.04
2001.4	-0.99	-3.35	-3.22	-0.61	-8.94	0.22	-1.82	-2.83	-0.10	0.91	1.77	3.92
2002.1	-0.53	-3.35	-2.99	1.64	-8.31	0.12	-1.67	-2.85	-0.23	0.82	1.59	3.72
2002.2	-0.17	-3.30	-2.77	3.53	-7.59	0.08	-1.50	-2.82	-0.29	0.75	1.37	3.54
2002.3	0.19	-3.26	-2.43	5.41	-6.76	0.04	-1.32	-2.78	-0.35	0.64	1.17	3.33
2002.4	0.59	-3.14	-1.97	7.34	-5.78	-0.01	-1.02	-2.70	-0.43	0.50	0.83	3.07

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

4.2 Evaluating a 'Modern' View of Macroeconomics (Chapter 7)

This section explains how to perform the inflation shock experiment in Chapter 7. It assumes that Chapter 7 has been read. This experiment is the same as experiment 3.6 except for a different prediction period. Table 4.2 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1994 through 1998.
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 third 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".

Table 4.2
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1994.1	-0.02	0.50	-0.01	-0.07	0.02	-0.05	0.00	0.45	0.09	0.05	0.00	-0.22
1994.2	-0.05	0.96	-0.02	-0.21	0.05	-0.08	0.00	0.86	0.14	0.11	0.01	-0.42
1994.3	-0.09	1.39	-0.05	-0.32	0.08	-0.12	0.00	1.24	0.20	0.16	0.03	-0.60
1994.4	-0.14	1.78	-0.08	-0.39	0.11	-0.17	0.00	1.59	0.28	0.21	0.06	-0.76
1995.1	-0.19	2.15	-0.13	-0.44	0.13	-0.26	0.00	1.94	0.47	0.23	0.08	-0.90
1995.2	-0.23	2.48	-0.17	-0.45	0.13	-0.30	0.00	2.25	0.56	0.26	0.11	-1.05
1995.3	-0.27	2.78	-0.22	-0.49	0.13	-0.34	0.00	2.52	0.65	0.28	0.14	-1.17
1995.4	-0.32	3.07	-0.27	-0.57	0.12	-0.39	0.00	2.78	0.75	0.30	0.16	-1.27
1996.1	-0.37	3.33	-0.32	-0.68	0.09	-0.48	0.00	3.05	0.99	0.31	0.19	-1.36
1996.2	-0.42	3.57	-0.37	-0.79	0.04	-0.52	0.00	3.27	1.07	0.33	0.22	-1.44
1996.3	-0.47	3.80	-0.41	-0.94	-0.02	-0.57	0.00	3.48	1.16	0.36	0.26	-1.51
1996.4	-0.52	3.99	-0.46	-1.10	-0.09	-0.61	0.00	3.66	1.26	0.38	0.28	-1.56
1997.1	-0.58	4.18	-0.51	-1.30	-0.18	-0.68	0.00	3.86	1.51	0.39	0.31	-1.59
1997.2	-0.63	4.35	-0.56	-1.48	-0.28	-0.72	0.00	4.02	1.61	0.40	0.35	-1.63
1997.3	-0.67	4.51	-0.60	-1.63	-0.39	-0.77	0.00	4.17	1.70	0.43	0.37	-1.65
1997.4	-0.71	4.65	-0.63	-1.81	-0.49	-0.82	0.00	4.31	1.79	0.46	0.40	-1.66
1998.1	-0.76	4.79	-0.67	-1.99	-0.61	-0.90	0.00	4.46	2.04	0.45	0.41	-1.67
1998.2	-0.78	4.93	-0.70	-2.11	-0.73	-0.92	0.00	4.59	2.10	0.47	0.43	-1.69
1998.3	-0.81	5.05	-0.74	-2.22	-0.84	-0.94	0.00	4.71	2.19	0.50	0.44	-1.69
1998.4	-0.83	5.17	-0.77	-2.32	-0.94	-0.96	0.00	4.82	2.27	0.53	0.45	-1.70

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

4.3 Estimated European Inflation Costs from Expansionary Policies (Chapter 8)

This section explains how to perform the German monetary policy experiment in Chapter 8. It assumes that Chapter 8 has been read. Table 4.3a presents selected results for the United States, and Table 4.3b presents selected results for Germany. If you use the MCF model for this experiment, you will duplicate the results in these tables.

This is a nice example for learning some of the features of the MCF 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 "MCF Model" in the left menu and copy MCFBASE 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".

Table 4.3a
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1982.1	0.00	-0.01	0.00	0.02	0.01	-0.01	-0.01	-0.05	-0.17	0.01	0.00	0.00
1982.2	0.00	-0.02	0.01	0.04	0.03	-0.02	-0.02	-0.08	-0.26	0.02	0.00	0.00
1982.3	0.01	-0.03	0.01	0.08	0.06	-0.04	-0.02	-0.10	-0.33	0.02	0.00	0.00
1982.4	0.02	-0.05	0.02	0.12	0.08	-0.05	-0.02	-0.13	-0.39	0.02	-0.01	0.00
1983.1	0.02	-0.07	0.02	0.16	0.12	-0.07	-0.03	-0.19	-0.58	0.03	-0.01	0.00
1983.2	0.03	-0.09	0.03	0.19	0.16	-0.08	-0.03	-0.22	-0.64	0.03	-0.01	0.00
1983.3	0.04	-0.11	0.04	0.22	0.19	-0.09	-0.03	-0.25	-0.69	0.03	-0.02	0.00
1983.4	0.04	-0.14	0.05	0.24	0.23	-0.10	-0.03	-0.28	-0.74	0.03	-0.02	0.00
1984.1	0.05	-0.16	0.06	0.27	0.27	-0.10	-0.03	-0.32	-0.86	0.04	-0.02	0.01
1984.2	0.06	-0.18	0.07	0.29	0.31	-0.08	-0.03	-0.34	-0.86	0.03	-0.03	0.01
1984.3	0.06	-0.21	0.08	0.31	0.34	-0.09	-0.03	-0.36	-0.90	0.04	-0.03	0.00
1984.4	0.06	-0.23	0.08	0.32	0.38	-0.09	-0.03	-0.38	-0.94	0.03	-0.03	0.00
1985.1	0.07	-0.25	0.09	0.34	0.41	-0.08	-0.03	-0.42	-1.02	0.04	-0.04	0.00
1985.2	0.07	-0.28	0.10	0.35	0.44	-0.06	-0.03	-0.44	-1.06	0.04	-0.04	0.01
1985.3	0.08	-0.30	0.10	0.37	0.47	-0.05	-0.03	-0.47	-1.10	0.04	-0.04	0.01
1985.4	0.08	-0.32	0.11	0.37	0.49	-0.05	-0.03	-0.49	-1.09	0.03	-0.04	0.01
1986.1	0.08	-0.34	0.11	0.38	0.52	-0.02	-0.03	-0.51	-1.14	0.04	-0.04	0.01
1986.2	0.08	-0.36	0.12	0.37	0.53	-0.01	-0.03	-0.53	-1.16	0.03	-0.05	0.01
1986.3	0.08	-0.37	0.12	0.36	0.55	0.00	-0.03	-0.54	-1.15	0.03	-0.05	0.01
1986.4	0.08	-0.39	0.13	0.35	0.56	0.02	-0.03	-0.56	-1.15	0.03	-0.04	0.01
1987.1	0.08	-0.41	0.13	0.35	0.56	0.04	-0.03	-0.57	-1.13	0.02	-0.04	0.01
1987.2	0.08	-0.42	0.13	0.32	0.56	0.05	-0.02	-0.57	-1.11	0.02	-0.04	0.01
1987.3	0.08	-0.43	0.13	0.29	0.56	0.05	-0.02	-0.58	-1.10	0.02	-0.04	0.01
1987.4	0.07	-0.44	0.13	0.27	0.56	0.07	-0.02	-0.59	-1.10	0.02	-0.04	0.01
1988.1	0.07	-0.45	0.13	0.25	0.54	0.09	-0.02	-0.58	-1.03	0.01	-0.04	0.01
1988.2	0.07	-0.45	0.12	0.23	0.53	0.09	-0.01	-0.59	-1.02	0.01	-0.04	0.01
1988.3	0.07	-0.46	0.12	0.21	0.52	0.10	-0.01	-0.58	-1.01	0.01	-0.04	0.01
1988.4	0.07	-0.46	0.12	0.19	0.51	0.12	-0.01	-0.58	-0.98	0.02	-0.03	0.01
1989.1	0.07	-0.46	0.12	0.18	0.49	0.12	-0.01	-0.58	-0.95	0.01	-0.03	0.01
1989.2	0.06	-0.46	0.11	0.16	0.48	0.12	0.00	-0.57	-0.93	0.01	-0.03	0.00
1989.3	0.06	-0.46	0.11	0.14	0.46	0.13	0.00	-0.57	-0.91	0.01	-0.03	0.00
1989.4	0.06	-0.46	0.11	0.12	0.44	0.13	0.00	-0.57	-0.89	0.01	-0.03	0.00
1990.1	0.05	-0.46	0.10	0.09	0.42	0.14	0.00	-0.57	-0.87	0.01	-0.03	0.00
1990.2	0.05	-0.47	0.10	0.08	0.41	0.15	0.00	-0.56	-0.87	0.01	-0.02	0.00
1990.3	0.05	-0.46	0.10	0.06	0.39	0.15	0.00	-0.56	-0.85	0.01	-0.02	0.00
1990.4	0.05	-0.46	0.09	0.04	0.37	0.16	0.00	-0.56	-0.82	0.01	-0.02	-0.01

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Table 4.3b
Results for Germany
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	E	PX	PM	SPCT	UR
1982.1	0.06	0.00	0.08	0.10	0.00	-0.01	-1.00	0.40	0.03	0.07	-0.02	-0.03
1982.2	0.12	0.01	0.16	0.19	0.01	0.00	-1.00	0.76	0.07	0.29	-0.06	-0.06
1982.3	0.19	0.01	0.23	0.27	0.01	0.02	-1.00	1.10	0.12	0.49	-0.10	-0.09
1982.4	0.26	0.03	0.31	0.36	0.01	0.05	-1.00	1.41	0.17	0.69	-0.13	-0.13
1983.1	0.32	0.05	0.40	0.46	0.02	0.04	-1.00	1.71	0.19	0.61	-0.11	-0.17
1983.2	0.39	0.07	0.48	0.55	0.03	0.06	-1.00	1.98	0.25	0.77	-0.14	-0.22
1983.3	0.46	0.09	0.57	0.65	0.04	0.09	-1.00	2.24	0.30	0.94	-0.17	-0.27
1983.4	0.53	0.12	0.66	0.74	0.06	0.11	-1.00	2.47	0.35	1.07	-0.19	-0.32
1984.1	0.57	0.16	0.73	0.81	0.07	0.12	-0.75	2.58	0.38	1.04	-0.18	-0.36
1984.2	0.64	0.20	0.81	0.88	0.09	0.13	-0.75	2.69	0.43	1.12	-0.19	-0.41
1984.3	0.69	0.24	0.88	0.95	0.11	0.16	-0.75	2.80	0.48	1.19	-0.19	-0.46
1984.4	0.74	0.28	0.95	1.02	0.13	0.17	-0.75	2.90	0.53	1.25	-0.19	-0.51
1985.1	0.78	0.33	1.02	1.09	0.16	0.18	-0.75	3.00	0.57	1.25	-0.20	-0.55
1985.2	0.83	0.37	1.08	1.15	0.18	0.20	-0.75	3.10	0.61	1.30	-0.19	-0.60
1985.3	0.88	0.42	1.15	1.21	0.21	0.23	-0.75	3.19	0.66	1.34	-0.19	-0.64
1985.4	0.93	0.47	1.21	1.27	0.24	0.24	-0.75	3.29	0.72	1.40	-0.18	-0.69
1986.1	0.96	0.53	1.25	1.30	0.27	0.26	-0.50	3.28	0.75	1.38	-0.16	-0.72
1986.2	0.99	0.58	1.29	1.33	0.31	0.30	-0.50	3.27	0.80	1.38	-0.14	-0.76
1986.3	1.01	0.64	1.33	1.37	0.34	0.30	-0.50	3.28	0.84	1.39	-0.12	-0.80
1986.4	1.03	0.70	1.37	1.39	0.38	0.31	-0.50	3.29	0.89	1.40	-0.12	-0.83
1987.1	1.05	0.75	1.40	1.42	0.41	0.32	-0.50	3.30	0.94	1.45	-0.12	-0.85
1987.2	1.08	0.81	1.43	1.44	0.45	0.33	-0.50	3.33	1.00	1.48	-0.13	-0.89
1987.3	1.09	0.87	1.46	1.46	0.49	0.33	-0.50	3.36	1.05	1.53	-0.14	-0.91
1987.4	1.11	0.92	1.48	1.48	0.53	0.34	-0.50	3.39	1.10	1.56	-0.13	-0.93
1988.1	1.08	0.98	1.48	1.47	0.56	0.35	-0.25	3.32	1.15	1.60	-0.14	-0.93
1988.2	1.08	1.03	1.48	1.46	0.60	0.35	-0.25	3.26	1.19	1.58	-0.13	-0.94
1988.3	1.07	1.09	1.48	1.45	0.64	0.35	-0.25	3.21	1.23	1.58	-0.14	-0.95
1988.4	1.04	1.14	1.47	1.44	0.68	0.34	-0.25	3.17	1.27	1.58	-0.14	-0.95
1989.1	1.03	1.18	1.46	1.42	0.71	0.33	-0.25	3.14	1.31	1.63	-0.16	-0.95
1989.2	0.99	1.23	1.45	1.40	0.75	0.33	-0.25	3.12	1.35	1.63	-0.17	-0.94
1989.3	0.98	1.27	1.43	1.38	0.78	0.31	-0.25	3.10	1.39	1.65	-0.17	-0.94
1989.4	0.95	1.31	1.41	1.36	0.82	0.30	-0.25	3.09	1.42	1.64	-0.18	-0.92
1990.1	0.94	1.35	1.39	1.34	0.85	0.32	-0.25	3.08	1.45	1.67	-0.17	-0.91
1990.2	0.90	1.39	1.37	1.31	0.88	0.30	-0.25	3.08	1.48	1.69	-0.19	-0.90
1990.3	0.85	1.42	1.34	1.28	0.91	0.26	-0.25	3.08	1.51	1.72	-0.22	-0.87
1990.4	0.79	1.45	1.31	1.25	0.94	0.23	-0.25	3.08	1.54	1.74	-0.25	-0.84

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
E = exchange rate relative to U.S. dollar,
PX = export price index, **PM** = import price index, **SPCT** = current account as a percent of GDP, **UR** = unemployment rate.

4.4 Evaluating Policy Rules (Chapter 11)

This section explains how to perform the interest rate experiment in Table 11.1 in Chapter 11. This experiment is the same as experiment 3.4 except for a different prediction period and a decrease in RS rather than an increase. It assumes that Chapter 11 has been read. Table 4.4 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1994 through 1998.
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".

Table 4.4
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1994.1	0.05	0.02	0.07	0.08	0.02	0.01	-1.00	0.06	0.24	-0.03	-0.01	-0.04
1994.2	0.16	0.05	0.16	0.55	0.10	0.02	-1.00	0.10	0.35	-0.05	-0.05	-0.13
1994.3	0.30	0.10	0.24	1.21	0.23	0.04	-1.00	0.17	0.45	-0.08	-0.10	-0.25
1994.4	0.43	0.17	0.32	1.90	0.42	0.05	-1.00	0.24	0.52	-0.10	-0.17	-0.38
1995.1	0.55	0.26	0.39	2.54	0.63	0.07	-1.00	0.35	0.73	-0.15	-0.23	-0.53
1995.2	0.65	0.35	0.46	3.19	0.87	0.09	-1.00	0.44	0.80	-0.18	-0.29	-0.68
1995.3	0.73	0.48	0.52	3.71	1.12	0.09	-1.00	0.56	0.84	-0.19	-0.34	-0.85
1995.4	0.78	0.55	0.57	4.09	1.36	0.11	-1.00	0.64	0.90	-0.22	-0.39	-0.98
1996.1	0.81	0.65	0.60	4.31	1.59	0.12	-1.00	0.75	1.08	-0.27	-0.41	-1.11
1996.2	0.82	0.74	0.63	4.38	1.79	0.14	-1.00	0.84	1.14	-0.29	-0.43	-1.23
1996.3	0.81	0.82	0.65	4.42	1.96	0.16	-1.00	0.92	1.20	-0.31	-0.43	-1.34
1996.4	0.78	0.90	0.65	4.38	2.10	0.17	-1.00	1.00	1.26	-0.33	-0.42	-1.44
1997.1	0.74	0.98	0.65	4.25	2.20	0.21	-1.00	1.10	1.45	-0.36	-0.39	-1.53
1997.2	0.69	1.05	0.64	4.03	2.25	0.23	-1.00	1.17	1.53	-0.37	-0.37	-1.61
1997.3	0.64	1.11	0.62	3.72	2.27	0.25	-1.00	1.23	1.60	-0.37	-0.34	-1.68
1997.4	0.58	1.15	0.60	3.43	2.25	0.27	-1.00	1.28	1.65	-0.37	-0.30	-1.74
1998.1	0.53	1.20	0.57	3.08	2.19	0.32	-1.00	1.35	1.87	-0.38	-0.26	-1.80
1998.2	0.47	1.23	0.54	2.70	2.10	0.36	-1.00	1.39	1.93	-0.36	-0.21	-1.85
1998.3	0.42	1.26	0.51	2.34	1.99	0.41	-1.00	1.43	2.02	-0.34	-0.17	-1.89
1998.4	0.37	1.28	0.47	2.00	1.85	0.45	-1.00	1.45	2.09	-0.33	-0.14	-1.92

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 5

Experiments in “Policy Effects in the Post Boom U.S. Economy.”

This chapter presents the seven experiments in Fair (2005), “Policy Effects in the Post Boom U.S. Economy.” If you do the following experiments using the MCB model on the website, you will exactly duplicate the results in this paper. This will not be true for the MCF model since the MCB and MCF models differ somewhat.

5.1 Experiment 1: No Tax Cuts

Table 5.1 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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 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.

Table 5.1
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.01	0.00	0.01	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2001.1	0.05	0.00	0.03	0.24	0.04	0.00	0.00	0.00	0.00	-0.01	-0.01	0.04
2001.2	0.08	0.01	0.05	0.42	0.08	0.00	0.00	0.01	0.00	-0.01	-0.02	0.06
2001.3	-0.20	0.01	-0.14	-1.38	-0.10	0.00	0.00	0.01	0.00	0.02	0.02	-0.19
2001.4	-0.31	-0.02	-0.16	-1.40	-0.25	0.00	0.00	-0.02	0.00	0.04	0.08	-0.18
2002.1	-0.64	-0.06	-0.37	-3.43	-0.61	-0.01	0.00	-0.05	-0.02	0.09	0.17	-0.46
2002.2	-1.01	-0.13	-0.60	-5.36	-1.12	0.00	0.00	-0.11	-0.04	0.17	0.30	-0.73
2002.3	-1.33	-0.21	-0.81	-6.97	-1.73	0.00	0.00	-0.19	-0.05	0.27	0.45	-1.01
2002.4	-1.59	-0.31	-1.02	-8.47	-2.41	0.00	0.00	-0.29	-0.08	0.37	0.59	-1.31
2003.1	-1.81	-0.44	-1.23	-9.82	-3.11	-0.02	0.00	-0.40	-0.18	0.49	0.72	-1.65
2003.2	-1.95	-0.56	-1.41	-10.67	-3.81	-0.02	0.00	-0.52	-0.22	0.59	0.82	-1.97
2003.3	-2.21	-0.70	-1.69	-12.26	-4.60	-0.02	0.00	-0.64	-0.28	0.72	0.91	-2.47
2003.4	-2.36	-0.85	-1.90	-12.83	-5.35	-0.02	0.00	-0.78	-0.34	0.85	1.00	-2.90
2004.1	-2.42	-1.02	-2.07	-13.37	-6.04	-0.09	0.00	-0.95	-0.53	1.01	1.05	-3.39
2004.2	-2.40	-1.17	-2.22	-13.25	-6.65	-0.10	0.00	-1.09	-0.62	1.16	1.05	-3.89
2004.3	-2.33	-1.30	-2.32	-12.86	-7.14	-0.12	0.00	-1.21	-0.71	1.27	1.01	-4.39

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

5.2 Experiment 2: No G Increase

Table 5.2 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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. 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.

Table 5.2
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001.1	-0.08	-0.01	0.00	-0.13	-0.01	0.00	0.00	-0.01	0.00	0.00	0.02	0.01
2001.2	-0.26	-0.02	-0.01	-0.50	-0.05	0.00	0.00	-0.02	0.00	0.01	0.07	0.04
2001.3	-0.40	-0.05	-0.03	-0.87	-0.12	0.00	0.00	-0.05	-0.01	0.01	0.13	0.06
2001.4	-0.55	-0.08	-0.04	-1.33	-0.22	0.01	0.00	-0.08	-0.01	0.02	0.21	0.07
2002.1	-0.74	-0.14	-0.07	-2.00	-0.36	0.01	0.00	-0.12	-0.04	0.04	0.29	0.08
2002.2	-0.98	-0.21	-0.10	-2.77	-0.54	0.02	0.00	-0.19	-0.05	0.06	0.40	0.11
2002.3	-1.17	-0.29	-0.14	-3.50	-0.75	0.02	0.00	-0.26	-0.06	0.09	0.51	0.10
2002.4	-1.36	-0.38	-0.18	-4.30	-1.00	0.03	0.00	-0.34	-0.08	0.12	0.60	0.10
2003.1	-1.39	-0.47	-0.22	-4.77	-1.24	0.04	0.00	-0.43	-0.15	0.16	0.67	0.04
2003.2	-1.69	-0.59	-0.26	-5.58	-1.52	0.05	0.00	-0.53	-0.18	0.19	0.78	0.06
2003.3	-1.79	-0.70	-0.31	-6.04	-1.80	0.05	0.00	-0.63	-0.22	0.23	0.84	0.02
2003.4	-1.82	-0.81	-0.35	-6.25	-2.07	0.06	0.00	-0.74	-0.25	0.26	0.90	-0.05
2004.1	-1.86	-0.93	-0.38	-6.58	-2.31	0.06	0.00	-0.86	-0.37	0.32	0.93	-0.14
2004.2	-1.87	-1.04	-0.41	-6.62	-2.53	0.06	0.00	-0.96	-0.42	0.36	0.93	-0.23
2004.3	-1.93	-1.15	-0.44	-6.69	-2.73	0.07	0.00	-1.06	-0.46	0.39	0.94	-0.33

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

5.3 Experiment 3: No RS Decrease

Table 5.3 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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.

Table 5.3
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001.1	-0.06	-0.03	-0.08	-0.05	-0.01	-0.01	1.20	-0.10	-0.43	0.07	0.01	0.04
2001.2	-0.23	-0.08	-0.26	-0.56	-0.11	-0.04	2.36	-0.19	-0.70	0.12	0.06	0.14
2001.3	-0.52	-0.17	-0.47	-1.67	-0.35	-0.08	2.85	-0.32	-1.01	0.18	0.16	0.32
2001.4	-0.92	-0.30	-0.77	-3.29	-0.76	-0.14	4.11	-0.50	-1.41	0.27	0.31	0.59
2002.1	-1.38	-0.51	-1.06	-5.45	-1.29	-0.18	4.20	-0.86	-2.45	0.48	0.50	0.92
2002.2	-1.84	-0.77	-1.35	-7.78	-1.99	-0.26	4.30	-1.14	-2.76	0.63	0.72	1.33
2002.3	-2.23	-1.03	-1.61	-10.03	-2.81	-0.33	4.37	-1.42	-3.02	0.76	0.95	1.75
2002.4	-2.58	-1.34	-1.88	-12.29	-3.72	-0.40	4.68	-1.73	-3.29	0.92	1.14	2.21
2003.1	-2.88	-1.69	-2.12	-14.29	-4.62	-0.47	4.86	-2.20	-4.22	1.16	1.33	2.67
2003.2	-3.10	-2.05	-2.34	-15.70	-5.54	-0.57	4.97	-2.56	-4.51	1.28	1.49	3.22
2003.3	-3.25	-2.41	-2.53	-16.69	-6.41	-0.66	5.09	-2.92	-4.82	1.40	1.57	3.69
2003.4	-3.33	-2.78	-2.70	-17.43	-7.24	-0.72	5.10	-3.27	-5.02	1.55	1.66	4.18
2004.1	-3.35	-3.16	-2.82	-18.04	-7.94	-0.85	5.10	-3.71	-5.71	1.77	1.69	4.62
2004.2	-3.27	-3.50	-2.89	-17.84	-8.54	-0.94	4.94	-4.03	-5.91	1.92	1.65	5.04
2004.3	-3.13	-3.80	-2.89	-17.42	-9.00	-1.06	4.53	-4.31	-5.97	1.98	1.56	5.42

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

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

Table 5.4 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

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

Table 5.4
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.03	0.00	0.01	0.11	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
2001.1	-0.09	-0.04	-0.06	0.05	0.02	-0.01	1.20	-0.10	-0.43	0.07	0.02	0.09
2001.2	-0.40	-0.09	-0.22	-0.64	-0.08	-0.04	2.36	-0.20	-0.71	0.11	0.11	0.24
2001.3	-1.12	-0.21	-0.63	-3.92	-0.57	-0.08	2.85	-0.36	-1.01	0.21	0.31	0.19
2001.4	-1.77	-0.40	-0.96	-6.00	-1.22	-0.14	4.11	-0.60	-1.43	0.33	0.59	0.48
2002.1	-2.75	-0.70	-1.49	-10.86	-2.24	-0.18	4.20	-1.03	-2.51	0.61	0.97	0.55
2002.2	-3.79	-1.10	-2.01	-15.84	-3.62	-0.25	4.30	-1.44	-2.84	0.85	1.42	0.71
2002.3	-4.69	-1.53	-2.51	-20.37	-5.23	-0.30	4.37	-1.87	-3.14	1.10	1.91	0.84
2002.4	-5.47	-2.02	-3.02	-24.89	-7.00	-0.37	4.68	-2.35	-3.45	1.38	2.34	1.00
2003.1	-6.00	-2.59	-3.49	-28.65	-8.79	-0.44	4.86	-3.03	-4.54	1.77	2.73	1.07
2003.2	-6.67	-3.19	-3.93	-31.67	-10.59	-0.54	4.97	-3.60	-4.90	2.00	3.12	1.31
2003.3	-7.19	-3.79	-4.42	-34.62	-12.42	-0.62	5.09	-4.18	-5.30	2.26	3.38	1.23
2003.4	-7.43	-4.42	-4.81	-36.01	-14.14	-0.67	5.10	-4.77	-5.58	2.57	3.62	1.21
2004.1	-7.55	-5.08	-5.13	-37.41	-15.65	-0.86	5.10	-5.48	-6.56	2.96	3.76	1.05
2004.2	-7.47	-5.67	-5.37	-37.06	-16.94	-0.95	4.94	-6.04	-6.89	3.27	3.74	0.86
2004.3	-7.34	-6.20	-5.50	-36.30	-17.97	-1.09	4.53	-6.53	-7.07	3.44	3.63	0.62

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

5.5 Experiment 5: No Stimulus and No Stock Market Decline

Table 5.5 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

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	239.6968
2001.1	242.8530
2001.2	246.6969
2001.3	250.6456
2001.4	252.6329
2002.1	255.7220
2002.2	258.5323
2002.3	260.8754
2002.4	263.5824
2003.1	267.3247
2003.2	271.3791
2003.3	274.3896
2003.4	277.8864
2004.1	281.4873
2004.2	285.1876
2004.3	290.4179

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

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

Table 5.5
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.03	0.00	0.01	0.11	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
2001.1	0.01	-0.02	0.10	0.23	0.10	-0.01	1.20	-0.09	-0.42	0.05	-0.03	0.04
2001.2	-0.02	-0.04	0.26	0.26	0.25	-0.04	2.36	-0.15	-0.69	0.06	-0.08	0.07
2001.3	-0.42	-0.08	0.07	-1.94	0.14	-0.08	2.85	-0.24	-0.99	0.12	-0.04	-0.16
2001.4	-0.66	-0.16	0.15	-2.67	0.05	-0.15	4.11	-0.38	-1.38	0.16	0.00	-0.11
2002.1	-1.29	-0.32	-0.13	-5.95	-0.31	-0.19	4.20	-0.68	-2.38	0.35	0.15	-0.29
2002.2	-2.15	-0.53	-0.45	-9.96	-1.02	-0.27	4.30	-0.92	-2.68	0.50	0.41	-0.39
2002.3	-2.82	-0.77	-0.62	-13.44	-1.90	-0.33	4.37	-1.18	-2.93	0.64	0.68	-0.53
2002.4	-3.27	-1.05	-0.63	-16.68	-2.81	-0.41	4.68	-1.47	-3.18	0.80	0.88	-0.73
2003.1	-3.46	-1.36	-0.76	-18.91	-3.69	-0.48	4.86	-1.90	-4.07	1.04	1.01	-1.03
2003.2	-3.87	-1.68	-0.87	-20.90	-4.59	-0.58	4.97	-2.22	-4.34	1.16	1.14	-1.24
2003.3	-4.32	-2.00	-1.25	-23.45	-5.65	-0.67	5.09	-2.54	-4.64	1.32	1.28	-1.64
2003.4	-4.71	-2.36	-1.61	-25.27	-6.79	-0.72	5.10	-2.88	-4.82	1.52	1.46	-1.92
2004.1	-5.16	-2.77	-2.07	-27.44	-7.98	-0.86	5.10	-3.35	-5.50	1.81	1.66	-2.21
2004.2	-5.53	-3.17	-2.50	-28.74	-9.22	-0.94	4.94	-3.72	-5.70	2.08	1.83	-2.45
2004.3	-5.82	-3.56	-2.82	-29.64	-10.41	-1.05	4.53	-4.08	-5.78	2.26	1.95	-2.72

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

5.6 Experiment 6: No Stimulus and No Export Decline

Table 5.6 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

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. 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. In the original paper 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.

Table 5.6
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.14	0.00	0.01	0.31	0.03	0.98	0.00	0.00	0.00	0.13	-0.03	-0.04
2001.1	0.24	-0.03	-0.04	0.69	0.09	2.34	1.20	-0.10	-0.42	0.37	-0.07	-0.05
2001.2	0.41	-0.06	-0.17	1.03	0.14	5.81	2.36	-0.17	-0.70	0.83	-0.14	-0.11
2001.3	0.51	-0.12	-0.52	-0.39	-0.06	11.38	2.85	-0.27	-0.99	1.53	-0.21	-0.55
2001.4	0.55	-0.17	-0.77	-0.41	-0.30	14.72	4.11	-0.39	-1.39	1.93	-0.26	-0.69
2002.1	-0.24	-0.29	-1.22	-3.78	-0.85	13.05	4.20	-0.66	-2.40	1.99	-0.12	-0.91
2002.2	-1.56	-0.46	-1.67	-8.27	-1.80	9.72	4.30	-0.86	-2.69	1.84	0.27	-0.93
2002.3	-2.70	-0.74	-2.13	-12.62	-3.04	8.99	4.37	-1.16	-2.95	1.97	0.76	-0.93
2002.4	-3.50	-1.11	-2.60	-16.82	-4.50	10.22	4.68	-1.53	-3.22	2.35	1.24	-0.98
2003.1	-3.94	-1.57	-3.05	-20.40	-6.04	11.43	4.86	-2.09	-4.17	2.83	1.63	-1.14
2003.2	-4.59	-2.05	-3.46	-23.62	-7.65	11.75	4.97	-2.55	-4.48	3.08	2.00	-1.16
2003.3	-5.31	-2.54	-3.95	-27.30	-9.38	9.78	5.09	-3.03	-4.82	3.13	2.33	-1.34
2003.4	-6.11	-3.08	-4.37	-30.12	-11.14	5.77	5.10	-3.53	-5.06	2.99	2.74	-1.32
2004.1	-6.74	-3.71	-4.73	-33.05	-12.83	3.79	5.10	-4.21	-5.91	3.18	3.11	-1.37
2004.2	-7.04	-4.32	-5.03	-34.22	-14.38	2.99	4.94	-4.77	-6.19	3.42	3.34	-1.46
2004.3	-7.16	-4.90	-5.24	-34.87	-15.75	2.42	4.53	-5.31	-6.34	3.58	3.46	-1.61

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

5.7 Experiment 7: Experiments 5 and 6 Combined

Table 5.7 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Combine experiments 5 and 6.

Table 5.7
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2000.4	0.14	0.00	0.01	0.31	0.03	0.98	0.00	0.00	0.00	0.13	-0.03	-0.04
2001.1	0.34	-0.02	0.12	0.87	0.17	2.34	1.20	-0.08	-0.41	0.36	-0.13	-0.10
2001.2	0.80	-0.01	0.31	1.92	0.46	5.81	2.36	-0.13	-0.68	0.78	-0.33	-0.28
2001.3	1.20	0.01	0.18	1.57	0.63	11.37	2.85	-0.15	-0.97	1.43	-0.56	-0.88
2001.4	1.66	0.06	0.34	2.87	0.97	14.71	4.11	-0.18	-1.35	1.77	-0.84	-1.25
2002.1	1.21	0.09	0.15	1.07	1.08	13.04	4.20	-0.31	-2.27	1.73	-0.93	-1.70
2002.2	0.08	0.11	-0.11	-2.47	0.81	9.69	4.30	-0.34	-2.53	1.49	-0.72	-1.96
2002.3	-0.85	0.01	-0.24	-5.77	0.30	8.95	4.37	-0.48	-2.74	1.51	-0.44	-2.22
2002.4	-1.32	-0.14	-0.22	-8.69	-0.29	10.17	4.68	-0.65	-2.95	1.76	-0.19	-2.61
2003.1	-1.43	-0.35	-0.32	-10.74	-0.90	11.40	4.86	-0.97	-3.71	2.09	-0.05	-3.10
2003.2	-1.81	-0.55	-0.42	-12.92	-1.58	11.71	4.97	-1.18	-3.93	2.23	0.08	-3.54
2003.3	-2.47	-0.77	-0.80	-16.17	-2.53	9.73	5.09	-1.41	-4.17	2.17	0.31	-4.03
2003.4	-3.42	-1.04	-1.17	-19.39	-3.69	5.72	5.10	-1.67	-4.29	1.93	0.65	-4.27
2004.1	-4.38	-1.42	-1.69	-23.06	-5.05	3.80	5.10	-2.10	-4.86	2.02	1.08	-4.47
2004.2	-5.11	-1.85	-2.18	-25.88	-6.56	3.01	4.94	-2.48	-5.02	2.22	1.50	-4.63
2004.3	-5.66	-2.29	-2.57	-28.20	-8.11	2.47	4.53	-2.89	-5.06	2.39	1.83	-4.82

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment, **IM** = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate, **PX** = export price index, **PM** = import price index, **SPCT** = current account as a percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 6

Experiments in "Evaluating Inflation Targeting Using a Macroeconometric Model."

This chapter presents the seven experiments in Fair (2007b), "Evaluating Inflation Targeting Using a Macroeconometric Model." If you do the following experiments using the MCC model on the website, you will exactly duplicate the results in this paper. This will not be true for the MCF model since the MCC and MCF models differ somewhat.

6.1 Experiment 1: Effects of a Decrease in RS

This is the same as experiment 4.1.

6.2 Experiment 2: Effects of a Positive Price Shock: RS Exogenous

This is the same as experiment 4.2. It is Case 1 in Table 6 in the paper.

6.3 Experiment 3: Effects of a Positive Price Shock: RS Endogenous

This is Case 2 in Table 6 in the paper. Table 6.3 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1994 through 1998.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Modify equation coefficients," then the United States, and then equation 10, the PF equation. Change the constant term in this equation by adding 0.005 to it. Be sure to save the changes once you are done.
5. Click "Solve the model and examine the results".

Table 6.3
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1994.1	-0.02	0.50	-0.01	-0.08	0.02	-0.05	0.12	0.44	0.05	0.06	0.00	-0.22
1994.2	-0.08	0.95	-0.05	-0.29	0.04	-0.08	0.25	0.84	0.07	0.12	0.02	-0.40
1994.3	-0.15	1.37	-0.11	-0.54	0.04	-0.13	0.32	1.20	0.10	0.18	0.05	-0.55
1994.4	-0.24	1.74	-0.17	-0.82	0.02	-0.18	0.34	1.54	0.14	0.23	0.09	-0.67
1995.1	-0.34	2.08	-0.24	-1.09	-0.02	-0.28	0.34	1.85	0.26	0.27	0.14	-0.77
1995.2	-0.42	2.39	-0.31	-1.33	-0.09	-0.32	0.35	2.13	0.33	0.31	0.19	-0.87
1995.3	-0.49	2.65	-0.38	-1.58	-0.17	-0.36	0.34	2.36	0.40	0.34	0.24	-0.93
1995.4	-0.57	2.91	-0.44	-1.82	-0.26	-0.42	0.32	2.60	0.48	0.36	0.28	-0.99
1996.1	-0.63	3.14	-0.51	-2.04	-0.38	-0.52	0.30	2.82	0.67	0.38	0.32	-1.03
1996.2	-0.69	3.35	-0.56	-2.19	-0.50	-0.56	0.28	3.02	0.74	0.41	0.36	-1.07
1996.3	-0.73	3.55	-0.61	-2.35	-0.62	-0.62	0.25	3.20	0.82	0.45	0.40	-1.11
1996.4	-0.77	3.71	-0.66	-2.48	-0.73	-0.66	0.22	3.36	0.91	0.48	0.42	-1.13
1997.1	-0.80	3.88	-0.70	-2.59	-0.85	-0.74	0.21	3.53	1.13	0.49	0.44	-1.15
1997.2	-0.82	4.04	-0.73	-2.66	-0.96	-0.78	0.18	3.68	1.21	0.50	0.46	-1.17
1997.3	-0.83	4.18	-0.75	-2.64	-1.05	-0.83	0.15	3.82	1.30	0.53	0.47	-1.19
1997.4	-0.83	4.32	-0.77	-2.65	-1.13	-0.89	0.14	3.95	1.38	0.55	0.47	-1.20
1998.1	-0.84	4.46	-0.79	-2.63	-1.20	-0.98	0.14	4.10	1.60	0.53	0.46	-1.20
1998.2	-0.84	4.59	-0.80	-2.57	-1.26	-1.01	0.14	4.23	1.66	0.55	0.45	-1.23
1998.3	-0.83	4.72	-0.82	-2.51	-1.30	-1.04	0.13	4.35	1.74	0.57	0.44	-1.24
1998.4	-0.83	4.84	-0.83	-2.44	-1.33	-1.07	0.12	4.46	1.81	0.58	0.44	-1.26

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

6.4 Experiment 4: Effects of a Positive Demand Shock: RS Exogenous

This is Case 1 in Table 7 in the paper. Table 6.4 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1994 through 1998.
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 RS equation (equation 30).
5. Click "Modify equation coefficients," then the United States, and then equation 1, the CS equation. Change the constant term in this equation by adding 0.005 to it. Be sure to save the changes once you are done. Then click the United States and then equation 2, the CN equation. Change the constant term in this equation by adding 0.005 to it. Be sure to save the changes once you are done.
6. Click "Solve the model and examine the results".

Table 6.4
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1994.1	0.33	0.01	0.47	0.73	0.24	0.00	0.00	0.01	0.01	-0.03	-0.07	-0.18
1994.2	0.78	0.08	0.91	1.89	0.70	0.00	0.00	0.07	0.02	-0.08	-0.23	-0.47
1994.3	1.21	0.20	1.30	3.21	1.31	-0.01	0.00	0.18	0.03	-0.16	-0.42	-0.80
1994.4	1.59	0.34	1.64	4.64	2.04	-0.02	0.00	0.31	0.06	-0.24	-0.63	-1.14
1995.1	1.89	0.52	1.94	6.03	2.84	-0.03	0.00	0.47	0.15	-0.35	-0.82	-1.48
1995.2	2.13	0.70	2.19	7.39	3.68	-0.03	0.00	0.63	0.20	-0.45	-0.97	-1.84
1995.3	2.29	0.99	2.40	8.43	4.51	-0.04	0.00	0.90	0.28	-0.53	-1.09	-2.20
1995.4	2.40	1.13	2.58	9.10	5.30	-0.05	0.00	1.03	0.35	-0.63	-1.18	-2.45
1996.1	2.43	1.30	2.71	9.42	6.01	-0.04	0.00	1.20	0.54	-0.74	-1.21	-2.71
1996.2	2.41	1.47	2.81	9.39	6.63	-0.04	0.00	1.36	0.64	-0.83	-1.22	-2.92
1996.3	2.35	1.60	2.88	9.29	7.15	-0.02	0.00	1.48	0.74	-0.90	-1.21	-3.10
1996.4	2.25	1.74	2.91	9.02	7.57	-0.01	0.00	1.62	0.84	-0.97	-1.14	-3.25
1997.1	2.13	1.85	2.92	8.53	7.85	0.04	0.00	1.75	1.12	-1.04	-1.06	-3.36
1997.2	1.99	1.95	2.92	7.87	8.02	0.06	0.00	1.86	1.23	-1.06	-0.99	-3.46
1997.3	1.84	2.02	2.88	7.02	8.08	0.10	0.00	1.94	1.35	-1.09	-0.89	-3.52
1997.4	1.70	2.07	2.84	6.24	8.04	0.15	0.00	1.99	1.46	-1.09	-0.78	-3.57
1998.1	1.56	2.10	2.80	5.37	7.91	0.23	0.00	2.05	1.72	-1.09	-0.66	-3.61
1998.2	1.43	2.11	2.74	4.49	7.71	0.30	0.00	2.07	1.80	-1.06	-0.54	-3.65
1998.3	1.32	2.10	2.68	3.66	7.45	0.36	0.00	2.07	1.90	-1.01	-0.45	-3.65
1998.4	1.20	2.08	2.60	2.86	7.14	0.44	0.00	2.06	1.99	-0.98	-0.38	-3.64

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

6.5 Experiment 5: Effects of a Positive Demand Shock: RS Endogenous

This is Case 2 in Table 7 in the paper. Table 6.5 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 1994 through 1998.
3. Click "Use historical errors" and set the option to use the historical errors.
4. Click "Modify equation coefficients," then the United States, and then equation 1, the CS equation. Change the constant term in this equation by adding 0.005 to it. Be sure to save the changes once you are done. Then click the United States and then equation 2, the CN equation. Change the constant term in this equation by adding 0.005 to it. Be sure to save the changes once you are done.
5. Click "Solve the model and examine the results".

Table 6.5
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1994.1	0.32	0.01	0.47	0.73	0.24	0.00	0.06	0.00	-0.02	-0.03	-0.07	-0.17
1994.2	0.76	0.07	0.89	1.85	0.69	-0.01	0.19	0.06	-0.04	-0.08	-0.22	-0.46
1994.3	1.17	0.18	1.25	3.05	1.28	-0.01	0.36	0.15	-0.06	-0.14	-0.41	-0.77
1994.4	1.49	0.31	1.55	4.25	1.96	-0.03	0.54	0.25	-0.09	-0.21	-0.60	-1.06
1995.1	1.72	0.45	1.79	5.32	2.69	-0.05	0.68	0.36	-0.16	-0.29	-0.76	-1.33
1995.2	1.86	0.59	1.98	6.23	3.41	-0.07	0.78	0.47	-0.19	-0.38	-0.87	-1.60
1995.3	1.93	0.82	2.13	6.78	4.09	-0.08	0.86	0.67	-0.18	-0.43	-0.94	-1.86
1995.4	1.94	0.89	2.24	6.95	4.70	-0.10	0.91	0.73	-0.17	-0.51	-0.98	-2.00
1996.1	1.89	0.99	2.31	6.82	5.22	-0.11	0.92	0.81	-0.16	-0.58	-0.97	-2.14
1996.2	1.80	1.08	2.36	6.43	5.63	-0.13	0.90	0.89	-0.11	-0.64	-0.94	-2.23
1996.3	1.69	1.14	2.38	6.01	5.93	-0.12	0.88	0.95	-0.06	-0.69	-0.89	-2.31
1996.4	1.57	1.20	2.39	5.50	6.14	-0.12	0.82	1.00	0.00	-0.74	-0.80	-2.35
1997.1	1.45	1.22	2.38	4.90	6.25	-0.10	0.75	1.04	0.15	-0.77	-0.71	-2.37
1997.2	1.34	1.27	2.37	4.27	6.28	-0.08	0.70	1.09	0.22	-0.78	-0.64	-2.39
1997.3	1.23	1.27	2.35	3.61	6.25	-0.06	0.64	1.10	0.31	-0.80	-0.56	-2.38
1997.4	1.16	1.27	2.34	3.04	6.16	-0.02	0.57	1.11	0.40	-0.80	-0.48	-2.39
1998.1	1.10	1.26	2.33	2.52	6.03	0.04	0.51	1.13	0.57	-0.79	-0.41	-2.40
1998.2	1.05	1.24	2.31	2.05	5.89	0.08	0.45	1.12	0.64	-0.77	-0.34	-2.41
1998.3	1.03	1.22	2.31	1.67	5.73	0.11	0.41	1.11	0.70	-0.75	-0.30	-2.41
1998.4	0.99	1.20	2.29	1.33	5.56	0.17	0.38	1.09	0.77	-0.74	-0.28	-2.40

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 7

Experiments in "Possible Macroeconomic Consequences of Large Future Federal Government Deficits."

This chapter presents some of the experiments in Fair (2010a), "Possible Macroeconomic Consequences of Large Future Federal Government Deficits." If you do the following experiments using the MCE model on the website, you will exactly duplicate the results in this paper. This will not be true for the MCF model since the MCE and MCF models differ somewhat. The MCF model forecast is the baseline forecast for the following experiments.

7.1 Run 1: Baseline Run

Table 7.1 presents selected results for the United States from the baseline run, which is the MCF model forecast. You can examine these results by doing the following.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2011 through 2020.
3. Click "Examine the results without solving the model".

Table 7.1
Results for the United States
Baseline Run
Percentage Points

qtr	g	π	RS	SPCT	UR	DEF	DEBT
2011.1	3.21	1.56	0.49	-3.32	9.19	8.29	55.27
2011.2	3.83	1.63	0.87	-3.10	8.75	8.25	57.78
2011.3	4.27	1.77	1.16	-2.88	8.31	8.19	60.16
2011.4	4.45	2.41	1.41	-2.71	7.93	7.52	62.32
2012.1	3.83	2.74	1.64	-2.55	7.62	6.48	63.33
2012.2	3.48	3.01	1.83	-2.41	7.40	6.47	64.01
2012.3	3.16	3.22	1.99	-2.28	7.22	6.46	64.64
2012.4	2.98	3.36	2.13	-2.18	7.08	6.39	65.21
2013.1	2.98	3.44	2.25	-2.10	6.98	6.21	65.75
2013.2	3.12	3.49	2.37	-2.03	6.88	6.18	66.21
2013.3	3.25	3.53	2.50	-1.98	6.77	6.14	66.62
2013.4	3.37	3.55	2.63	-1.94	6.66	6.09	66.99
2014.1	3.51	3.57	2.76	-1.91	6.55	6.04	67.35
2014.2	3.53	3.59	2.88	-1.90	6.45	6.01	67.71
2014.3	3.47	3.60	2.98	-1.89	6.36	5.97	68.08
2014.4	3.38	3.61	3.08	-1.89	6.29	5.95	68.45
2015.1	3.27	3.60	3.16	-1.88	6.23	5.93	68.82
2015.2	3.17	3.59	3.22	-1.88	6.19	5.92	69.22
2015.3	3.07	3.56	3.27	-1.87	6.16	5.92	69.62
2015.4	2.98	3.53	3.30	-1.86	6.15	5.92	70.03
2016.1	2.91	3.49	3.33	-1.84	6.14	5.93	70.46
2016.2	2.85	3.44	3.35	-1.82	6.14	5.93	70.90
2016.3	2.81	3.39	3.36	-1.79	6.14	5.95	71.34
2016.4	2.77	3.34	3.37	-1.76	6.15	5.96	71.79
2017.1	2.75	3.29	3.37	-1.72	6.16	5.97	72.25
2017.2	2.74	3.24	3.37	-1.67	6.17	5.98	72.71
2017.3	2.73	3.19	3.37	-1.62	6.17	5.99	73.18
2017.4	2.74	3.15	3.37	-1.56	6.18	5.99	73.63
2018.1	2.74	3.12	3.37	-1.50	6.18	6.00	74.09
2018.2	2.75	3.08	3.37	-1.44	6.17	6.00	74.55
2018.3	2.77	3.06	3.37	-1.37	6.17	6.00	75.00
2018.4	2.78	3.03	3.38	-1.29	6.16	5.99	75.43
2019.1	2.80	3.02	3.39	-1.22	6.14	5.99	75.86
2019.2	2.82	3.00	3.40	-1.14	6.12	5.98	76.28
2019.3	2.84	2.99	3.41	-1.06	6.10	5.96	76.69
2019.4	2.86	2.98	3.43	-0.98	6.08	5.95	77.08
2020.1	2.88	2.98	3.45	-0.90	6.05	5.92	77.46
2020.2	2.91	2.98	3.48	-0.82	6.01	5.90	77.82
2020.3	2.93	2.98	3.50	-0.74	5.98	5.87	78.17
2020.4	2.96	2.98	3.54	-0.66	5.94	5.84	78.48

- **g** = real GDP, four quarter percent change.
- π = GDP deflator, four quarter percent change.
- **RS** = three-month Treasury bill rate.
- **SPCT** = current account as a percent of GDP.
- **UR** = unemployment rate.
- **DEF** = federal government deficit as a percent of GDP.
- **DEBT** = federal government debt as a percent of GDP.

7.2 Run 3: Sluggish Stock Market

Tables 7.2a and 7.2b present selected results for the United States. Table 7.2a gives results in terms of the levels of the variables, and Table 7.2b gives results in terms of differences from the baseline run. If you use the MCF model for this experiment, you will duplicate the results in these tables.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2011 through 2020.
3. Click "Modify equation coefficients," click the United States, click equation 25 (the CG equation), change the first coefficient (the constant term) to be half the estimated value, and click "Save Changes.".
4. Click "Solve the model and examine the results".

This experiment is Run 3 in Table 2 in the paper.

Table 7.1a
Results for the United States
Predicted Levels
Percentage Points

qtr	g	π	RS	SPCT	UR	DEF	DEBT
2011.1	3.21	1.56	0.49	-3.32	9.19	8.29	55.27
2011.2	3.82	1.63	0.86	-3.10	8.75	8.25	57.79
2011.3	4.24	1.76	1.15	-2.88	8.33	8.20	60.18
2011.4	4.39	2.41	1.38	-2.70	7.96	7.54	62.36
2012.1	3.74	2.73	1.60	-2.54	7.67	6.50	63.40
2012.2	3.36	2.98	1.77	-2.39	7.47	6.51	64.13
2012.3	3.03	3.18	1.90	-2.25	7.33	6.50	64.79
2012.4	2.84	3.31	2.01	-2.13	7.22	6.44	65.41
2013.1	2.84	3.37	2.11	-2.04	7.14	6.28	66.00
2013.2	2.99	3.41	2.20	-1.95	7.07	6.25	66.50
2013.3	3.13	3.43	2.30	-1.89	6.99	6.22	66.96
2013.4	3.26	3.44	2.41	-1.83	6.90	6.17	67.38
2014.1	3.42	3.45	2.52	-1.79	6.82	6.13	67.79
2014.2	3.46	3.46	2.62	-1.76	6.74	6.10	68.19
2014.3	3.41	3.47	2.71	-1.73	6.67	6.07	68.60
2014.4	3.33	3.47	2.78	-1.71	6.61	6.04	69.01
2015.1	3.23	3.46	2.84	-1.68	6.57	6.02	69.43
2015.2	3.13	3.44	2.89	-1.66	6.54	6.01	69.86
2015.3	3.04	3.42	2.92	-1.64	6.53	6.01	70.31
2015.4	2.97	3.38	2.95	-1.61	6.52	6.01	70.76
2016.1	2.90	3.34	2.96	-1.57	6.53	6.01	71.22
2016.2	2.85	3.29	2.96	-1.54	6.54	6.02	71.69
2016.3	2.80	3.24	2.96	-1.49	6.56	6.02	72.17
2016.4	2.77	3.19	2.95	-1.44	6.58	6.03	72.65
2017.1	2.75	3.14	2.94	-1.38	6.60	6.04	73.14
2017.2	2.74	3.09	2.93	-1.32	6.62	6.04	73.63
2017.3	2.74	3.04	2.91	-1.26	6.64	6.05	74.12
2017.4	2.74	3.00	2.90	-1.19	6.65	6.05	74.60
2018.1	2.75	2.97	2.89	-1.10	6.67	6.05	75.08
2018.2	2.76	2.93	2.87	-1.03	6.68	6.05	75.56
2018.3	2.78	2.91	2.86	-0.95	6.69	6.04	76.03
2018.4	2.79	2.88	2.86	-0.86	6.69	6.03	76.49
2019.1	2.81	2.86	2.85	-0.77	6.69	6.02	76.93
2019.2	2.83	2.85	2.85	-0.68	6.68	6.00	77.37
2019.3	2.85	2.84	2.85	-0.59	6.67	5.98	77.79
2019.4	2.87	2.83	2.86	-0.50	6.66	5.96	78.20
2020.1	2.90	2.83	2.87	-0.40	6.64	5.93	78.58
2020.2	2.92	2.83	2.88	-0.30	6.62	5.90	78.95
2020.3	2.95	2.83	2.90	-0.21	6.60	5.87	79.31
2020.4	2.98	2.83	2.92	-0.12	6.57	5.83	79.63

- **g** = real GDP, four quarter percent change.
- π = GDP deflator, four quarter percent change.
- **RS** = three-month Treasury bill rate.
- **SPCT** = current account as a percent of GDP.
- **UR** = unemployment rate.
- **DEF** = federal government deficit as a percent of GDP.
- **DEBT** = federal government debt as a percent of GDP.

Table 7.1b
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2011.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011.2	-0.01	0.00	-0.01	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2011.3	-0.03	0.00	-0.03	-0.07	-0.02	0.00	-0.01	0.00	0.00	0.00	0.01	0.02
2011.4	-0.05	-0.01	-0.06	-0.15	-0.06	0.00	-0.03	-0.01	0.00	0.01	0.03	0.04
2012.1	-0.09	-0.01	-0.10	-0.27	-0.10	0.00	-0.04	-0.01	0.01	0.01	0.05	0.07
2012.2	-0.13	-0.03	-0.14	-0.40	-0.17	0.00	-0.07	-0.02	0.02	0.02	0.08	0.11
2012.3	-0.16	-0.04	-0.18	-0.52	-0.25	0.01	-0.09	-0.03	0.02	0.03	0.11	0.15
2012.4	-0.20	-0.06	-0.23	-0.64	-0.34	0.01	-0.12	-0.05	0.03	0.05	0.13	0.20
2013.1	-0.23	-0.08	-0.27	-0.76	-0.45	0.01	-0.14	-0.06	0.05	0.06	0.16	0.25
2013.2	-0.26	-0.11	-0.32	-0.86	-0.56	0.02	-0.17	-0.08	0.06	0.07	0.19	0.30
2013.3	-0.28	-0.14	-0.36	-0.94	-0.67	0.03	-0.19	-0.11	0.07	0.09	0.22	0.34
2013.4	-0.30	-0.17	-0.41	-1.00	-0.79	0.03	-0.22	-0.13	0.07	0.11	0.24	0.39
2014.1	-0.32	-0.20	-0.46	-1.06	-0.91	0.03	-0.24	-0.16	0.08	0.13	0.27	0.44
2014.2	-0.33	-0.23	-0.50	-1.09	-1.02	0.04	-0.26	-0.18	0.08	0.14	0.29	0.49
2014.3	-0.34	-0.27	-0.54	-1.11	-1.13	0.05	-0.28	-0.21	0.08	0.16	0.31	0.53
2014.4	-0.35	-0.30	-0.58	-1.13	-1.24	0.06	-0.30	-0.24	0.08	0.18	0.33	0.57
2015.1	-0.35	-0.34	-0.62	-1.13	-1.34	0.06	-0.32	-0.28	0.07	0.20	0.34	0.62
2015.2	-0.36	-0.37	-0.66	-1.12	-1.44	0.07	-0.33	-0.31	0.06	0.22	0.36	0.66
2015.3	-0.36	-0.41	-0.70	-1.11	-1.53	0.07	-0.35	-0.34	0.06	0.24	0.37	0.70
2015.4	-0.36	-0.44	-0.74	-1.09	-1.62	0.08	-0.36	-0.37	0.05	0.25	0.38	0.73
2016.1	-0.37	-0.48	-0.77	-1.06	-1.70	0.08	-0.38	-0.40	0.03	0.28	0.40	0.77
2016.2	-0.37	-0.52	-0.81	-1.02	-1.78	0.09	-0.39	-0.44	0.02	0.29	0.41	0.81
2016.3	-0.37	-0.55	-0.84	-0.99	-1.85	0.09	-0.41	-0.47	0.01	0.31	0.42	0.84
2016.4	-0.37	-0.59	-0.88	-0.94	-1.92	0.10	-0.42	-0.50	0.00	0.32	0.43	0.87
2017.1	-0.37	-0.63	-0.91	-0.90	-1.98	0.10	-0.44	-0.54	-0.03	0.34	0.45	0.90
2017.2	-0.36	-0.66	-0.94	-0.85	-2.04	0.11	-0.45	-0.57	-0.04	0.36	0.46	0.93
2017.3	-0.36	-0.70	-0.97	-0.79	-2.09	0.12	-0.46	-0.60	-0.05	0.37	0.47	0.96
2017.4	-0.36	-0.74	-1.00	-0.74	-2.15	0.12	-0.48	-0.64	-0.07	0.38	0.49	0.98
2018.1	-0.36	-0.77	-1.03	-0.68	-2.20	0.13	-0.49	-0.67	-0.09	0.40	0.50	1.01
2018.2	-0.35	-0.81	-1.06	-0.63	-2.24	0.13	-0.50	-0.71	-0.10	0.42	0.51	1.03
2018.3	-0.35	-0.85	-1.09	-0.57	-2.29	0.14	-0.52	-0.74	-0.11	0.43	0.53	1.05
2018.4	-0.35	-0.88	-1.12	-0.51	-2.33	0.15	-0.53	-0.77	-0.12	0.44	0.54	1.07
2019.1	-0.35	-0.92	-1.15	-0.45	-2.37	0.16	-0.54	-0.81	-0.15	0.46	0.55	1.09
2019.2	-0.34	-0.96	-1.18	-0.40	-2.41	0.17	-0.56	-0.84	-0.16	0.47	0.57	1.11
2019.3	-0.34	-1.00	-1.21	-0.34	-2.45	0.19	-0.57	-0.87	-0.16	0.48	0.58	1.12
2019.4	-0.34	-1.03	-1.24	-0.29	-2.50	0.20	-0.58	-0.91	-0.17	0.49	0.59	1.13
2020.1	-0.33	-1.07	-1.26	-0.23	-2.53	0.21	-0.59	-0.94	-0.19	0.52	0.61	1.14
2020.2	-0.33	-1.11	-1.29	-0.18	-2.57	0.23	-0.61	-0.97	-0.19	0.53	0.62	1.15
2020.3	-0.32	-1.14	-1.32	-0.13	-2.61	0.24	-0.62	-1.01	-0.20	0.54	0.63	1.16
2020.4	-0.32	-1.18	-1.35	-0.09	-2.65	0.26	-0.63	-1.04	-0.21	0.55	0.65	1.16

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

7.3 Run 4: Income Tax Increase

Tables 7.3a and 7.3b present selected results for the United States. Table 7.3a gives results in terms of the levels of the variables, and Table 7.3b gives results in terms of differences from the baseline run. If you use the MCF model for this experiment, you will duplicate the results in these tables.

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

2. Click "Set prediction period" and set the period to be 2011 through 2020.

3. Click "Examine the results without solving the model." List the values of GDP, THG, YT, $TAUG$, POP, and PH for 2011:1–2020:4. Compute for each quarter:

   $$D1G^{new} = (THG + .03 \cdot GDP)/YT - (TAUG \cdot YT)/(POP \cdot PH)$$

   Then return to the main menu page.

4. 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.

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

This experiment is Run 4 in Table 3 in the paper.

Table 7.3a
Results for the United States
Predicted Levels
Percentage Points

qtr	g	π	RS	SPCT	UR	DEF	DEBT
2011.1	2.58	1.62	0.42	-3.23	9.28	5.42	54.85
2011.2	2.45	1.69	0.61	-2.88	9.05	5.56	57.11
2011.3	2.31	1.77	0.66	-2.51	8.87	5.65	59.24
2011.4	2.11	2.32	0.70	-2.18	8.72	5.06	61.10
2012.1	1.93	2.47	0.79	-1.88	8.59	4.06	61.72
2012.2	2.28	2.61	0.90	-1.59	8.47	4.06	61.94
2012.3	2.61	2.74	1.02	-1.34	8.33	4.01	62.03
2012.4	2.93	2.86	1.17	-1.13	8.16	3.89	62.02
2013.1	3.29	2.95	1.34	-0.97	7.98	3.64	61.94
2013.2	3.64	3.06	1.53	-0.83	7.78	3.54	61.75
2013.3	3.87	3.18	1.74	-0.72	7.55	3.41	61.48
2013.4	4.01	3.30	1.97	-0.64	7.32	3.29	61.18
2014.1	4.13	3.40	2.18	-0.57	7.09	3.17	60.86
2014.2	4.10	3.49	2.38	-0.54	6.88	3.06	60.53
2014.3	3.96	3.57	2.57	-0.52	6.70	2.97	60.21
2014.4	3.79	3.63	2.73	-0.52	6.55	2.88	59.88
2015.1	3.61	3.66	2.85	-0.48	6.43	2.81	59.59
2015.2	3.44	3.66	2.96	-0.49	6.34	2.76	59.30
2015.3	3.28	3.65	3.05	-0.50	6.27	2.71	59.03
2015.4	3.14	3.61	3.12	-0.51	6.23	2.68	58.77
2016.1	3.03	3.56	3.16	-0.47	6.21	2.65	58.54
2016.2	2.93	3.50	3.18	-0.47	6.20	2.62	58.32
2016.3	2.85	3.44	3.20	-0.47	6.20	2.60	58.11
2016.4	2.79	3.37	3.22	-0.45	6.21	2.59	57.92
2017.1	2.74	3.30	3.21	-0.40	6.23	2.57	57.74
2017.2	2.71	3.24	3.21	-0.37	6.25	2.56	57.57
2017.3	2.70	3.18	3.20	-0.33	6.27	2.55	57.40
2017.4	2.69	3.12	3.20	-0.28	6.28	2.54	57.24
2018.1	2.69	3.08	3.19	-0.20	6.30	2.52	57.08
2018.2	2.70	3.03	3.18	-0.14	6.31	2.50	56.92
2018.3	2.70	3.00	3.18	-0.07	6.32	2.48	56.76
2018.4	2.72	2.97	3.18	0.01	6.32	2.46	56.59
2019.1	2.74	2.96	3.18	0.10	6.32	2.43	56.42
2019.2	2.76	2.94	3.18	0.19	6.31	2.40	56.24
2019.3	2.79	2.93	3.19	0.29	6.30	2.37	56.05
2019.4	2.81	2.93	3.20	0.39	6.29	2.33	55.85
2020.1	2.84	2.93	3.22	0.50	6.27	2.29	55.63
2020.2	2.87	2.93	3.24	0.61	6.24	2.25	55.41
2020.3	2.90	2.94	3.27	0.71	6.22	2.20	55.17
2020.4	2.93	2.95	3.29	0.82	6.18	2.14	54.91

- **g** = real GDP, four quarter percent change.
- π = GDP deflator, four quarter percent change.
- **RS** = three-month Treasury bill rate.
- **SPCT** = current account as a percent of GDP.
- **UR** = unemployment rate.
- **DEF** = federal government deficit as a percent of GDP.
- **DEBT** = federal government debt as a percent of GDP.

Table 7.3b
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2011.1	-0.61	0.06	-0.39	-4.67	-0.47	-0.02	-0.07	0.06	0.04	0.09	0.09	-0.42
2011.2	-1.32	0.06	-0.76	-8.43	-1.24	-0.02	-0.26	0.06	0.07	0.22	0.30	-0.67
2011.3	-1.88	0.00	-1.10	-11.06	-2.19	-0.01	-0.50	0.02	0.11	0.38	0.56	-0.92
2011.4	-2.24	-0.09	-1.39	-12.96	-3.21	0.00	-0.71	-0.05	0.17	0.53	0.79	-1.22
2012.1	-2.43	-0.21	-1.63	-14.30	-4.23	-0.02	-0.85	-0.12	0.33	0.67	0.97	-1.61
2012.2	-2.47	-0.34	-1.83	-14.90	-5.18	0.01	-0.93	-0.23	0.38	0.82	1.07	-2.08
2012.3	-2.41	-0.47	-1.98	-14.86	-6.00	0.04	-0.97	-0.33	0.43	0.94	1.10	-2.61
2012.4	-2.28	-0.58	-2.10	-14.39	-6.68	0.07	-0.96	-0.42	0.46	1.05	1.07	-3.20
2013.1	-2.14	-0.68	-2.18	-13.66	-7.22	0.03	-0.91	-0.49	0.50	1.13	1.00	-3.82
2013.2	-1.98	-0.75	-2.24	-12.73	-7.61	0.06	-0.84	-0.55	0.50	1.20	0.90	-4.47
2013.3	-1.82	-0.80	-2.29	-11.71	-7.88	0.07	-0.75	-0.60	0.47	1.26	0.78	-5.13
2013.4	-1.67	-0.83	-2.32	-10.67	-8.03	0.07	-0.66	-0.63	0.43	1.30	0.66	-5.81
2014.1	-1.55	-0.84	-2.35	-9.66	-8.08	-0.02	-0.58	-0.66	0.25	1.34	0.54	-6.49
2014.2	-1.45	-0.84	-2.36	-8.71	-8.05	-0.04	-0.50	-0.67	0.17	1.36	0.43	-7.18
2014.3	-1.35	-0.83	-2.38	-7.83	-7.97	-0.08	-0.42	-0.67	0.08	1.37	0.34	-7.87
2014.4	-1.28	-0.81	-2.40	-7.03	-7.84	-0.12	-0.35	-0.67	-0.01	1.37	0.26	-8.56
2015.1	-1.23	-0.79	-2.41	-6.31	-7.66	-0.24	-0.30	-0.69	-0.28	1.40	0.20	-9.24
2015.2	-1.18	-0.77	-2.42	-5.66	-7.48	-0.30	-0.26	-0.69	-0.38	1.38	0.15	-9.92
2015.3	-1.15	-0.75	-2.44	-5.08	-7.28	-0.35	-0.22	-0.68	-0.46	1.37	0.11	-10.59
2015.4	-1.13	-0.73	-2.46	-4.57	-7.08	-0.41	-0.19	-0.68	-0.55	1.35	0.08	-11.27
2016.1	-1.12	-0.72	-2.48	-4.13	-6.88	-0.52	-0.18	-0.70	-0.77	1.37	0.07	-11.92
2016.2	-1.11	-0.71	-2.50	-3.74	-6.69	-0.58	-0.17	-0.70	-0.84	1.35	0.06	-12.58
2016.3	-1.11	-0.70	-2.52	-3.40	-6.52	-0.64	-0.16	-0.71	-0.90	1.33	0.06	-13.23
2016.4	-1.11	-0.70	-2.54	-3.11	-6.36	-0.69	-0.15	-0.71	-0.95	1.31	0.06	-13.88
2017.1	-1.12	-0.71	-2.57	-2.87	-6.22	-0.76	-0.16	-0.74	-1.07	1.32	0.07	-14.51
2017.2	-1.14	-0.71	-2.59	-2.67	-6.10	-0.80	-0.16	-0.75	-1.10	1.31	0.08	-15.14
2017.3	-1.15	-0.72	-2.62	-2.50	-6.00	-0.84	-0.16	-0.76	-1.12	1.29	0.09	-15.77
2017.4	-1.16	-0.73	-2.65	-2.37	-5.92	-0.86	-0.17	-0.77	-1.14	1.28	0.11	-16.39
2018.1	-1.18	-0.75	-2.68	-2.27	-5.86	-0.90	-0.18	-0.79	-1.16	1.30	0.12	-17.01
2018.2	-1.19	-0.76	-2.71	-2.20	-5.82	-0.91	-0.19	-0.80	-1.16	1.30	0.13	-17.63
2018.3	-1.21	-0.77	-2.75	-2.14	-5.80	-0.92	-0.20	-0.81	-1.15	1.30	0.15	-18.24
2018.4	-1.22	-0.79	-2.78	-2.11	-5.80	-0.92	-0.20	-0.83	-1.14	1.30	0.16	-18.84
2019.1	-1.23	-0.80	-2.82	-2.11	-5.81	-0.92	-0.21	-0.83	-1.09	1.32	0.18	-19.44
2019.2	-1.25	-0.82	-2.85	-2.12	-5.84	-0.91	-0.22	-0.84	-1.07	1.33	0.19	-20.04
2019.3	-1.26	-0.83	-2.89	-2.13	-5.88	-0.90	-0.22	-0.85	-1.04	1.35	0.20	-20.64
2019.4	-1.26	-0.85	-2.93	-2.16	-5.93	-0.88	-0.23	-0.86	-1.02	1.37	0.21	-21.23
2020.1	-1.27	-0.85	-2.97	-2.21	-6.00	-0.87	-0.23	-0.85	-0.93	1.40	0.22	-21.82
2020.2	-1.28	-0.86	-3.01	-2.26	-6.07	-0.84	-0.23	-0.86	-0.90	1.43	0.23	-22.41
2020.3	-1.29	-0.87	-3.05	-2.31	-6.15	-0.81	-0.24	-0.86	-0.88	1.46	0.24	-23.00
2020.4	-1.29	-0.88	-3.08	-2.37	-6.24	-0.78	-0.24	-0.86	-0.85	1.49	0.25	-23.57

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

7.4 Run 5: Transfer Payment Decrease

Tables 7.4a and 7.4b present selected results for the United States. Table 7.4a gives results in terms of the levels of the variables, and Table 7.4b gives results in terms of differences from the baseline run. If you use the MCF model for this experiment, you will duplicate the results in these tables.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE to a dataset you have named.
2. Click "Set prediction period" and set the period to be 2011 through 2020.
3. Click "Examine the results without solving the model." List the values of $GDPR$ for 2011:1–2020:4. Take -3.0 percent of each of these values, which we will call 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".

This experiment is Run 5 in Table 3 in the paper.

Table 7.4a
Results for the United States
Predicted Levels
Percentage Points

qtr	g	π	RS	SPCT	UR	DEF	DEBT
2011.1	2.56	1.61	0.38	-3.23	9.33	5.42	54.86
2011.2	2.40	1.67	0.53	-2.88	9.14	5.54	57.14
2011.3	2.23	1.73	0.54	-2.50	9.01	5.63	59.29
2011.4	2.01	2.26	0.55	-2.17	8.90	5.03	61.18
2012.1	1.84	2.39	0.61	-1.87	8.80	4.03	61.81
2012.2	2.23	2.51	0.69	-1.58	8.71	4.02	62.02
2012.3	2.61	2.63	0.80	-1.33	8.58	3.96	62.11
2012.4	2.97	2.74	0.93	-1.12	8.43	3.83	62.09
2013.1	3.36	2.83	1.09	-0.96	8.26	3.58	61.99
2013.2	3.72	2.95	1.28	-0.82	8.06	3.46	61.78
2013.3	3.97	3.07	1.49	-0.72	7.83	3.33	61.49
2013.4	4.11	3.19	1.71	-0.65	7.60	3.20	61.16
2014.1	4.23	3.30	1.92	-0.58	7.38	3.08	60.82
2014.2	4.18	3.41	2.12	-0.56	7.17	2.96	60.47
2014.3	4.04	3.49	2.30	-0.55	6.99	2.86	60.12
2014.4	3.85	3.56	2.46	-0.55	6.84	2.78	59.78
2015.1	3.66	3.59	2.58	-0.52	6.73	2.70	59.46
2015.2	3.48	3.59	2.68	-0.53	6.64	2.64	59.15
2015.3	3.31	3.58	2.76	-0.55	6.58	2.59	58.85
2015.4	3.17	3.54	2.82	-0.56	6.54	2.55	58.57
2016.1	3.05	3.49	2.85	-0.53	6.53	2.51	58.32
2016.2	2.94	3.43	2.87	-0.53	6.53	2.49	58.08
2016.3	2.86	3.37	2.88	-0.53	6.54	2.46	57.85
2016.4	2.80	3.29	2.89	-0.52	6.56	2.44	57.63
2017.1	2.75	3.23	2.87	-0.47	6.58	2.42	57.43
2017.2	2.72	3.16	2.86	-0.44	6.61	2.41	57.23
2017.3	2.70	3.10	2.85	-0.41	6.64	2.39	57.04
2017.4	2.70	3.04	2.83	-0.36	6.66	2.37	56.85
2018.1	2.70	3.00	2.82	-0.29	6.68	2.35	56.66
2018.2	2.70	2.96	2.81	-0.23	6.70	2.32	56.47
2018.3	2.71	2.92	2.79	-0.16	6.72	2.30	56.28
2018.4	2.73	2.90	2.79	-0.08	6.73	2.27	56.08
2019.1	2.75	2.88	2.78	0.02	6.74	2.24	55.87
2019.2	2.78	2.87	2.78	0.11	6.74	2.20	55.65
2019.3	2.80	2.86	2.78	0.20	6.73	2.16	55.43
2019.4	2.83	2.86	2.79	0.30	6.72	2.12	55.19
2020.1	2.85	2.86	2.80	0.41	6.71	2.07	54.94
2020.2	2.88	2.86	2.82	0.52	6.69	2.02	54.67
2020.3	2.91	2.87	2.84	0.63	6.67	1.97	54.39
2020.4	2.95	2.88	2.86	0.75	6.64	1.91	54.09

- **g** = real GDP, four quarter percent change.
- π = GDP deflator, four quarter percent change.
- **RS** = three-month Treasury bill rate.
- **SPCT** = current account as a percent of GDP.
- **UR** = unemployment rate.
- **DEF** = federal government deficit as a percent of GDP.
- **DEBT** = federal government debt as a percent of GDP.

Table 7.4b
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2011.1	-0.62	0.05	-0.41	-4.72	-0.48	-0.02	-0.11	0.05	0.05	0.09	0.14	-0.41
2011.2	-1.37	0.04	-0.80	-8.69	-1.29	-0.01	-0.34	0.05	0.09	0.22	0.40	-0.64
2011.3	-1.96	-0.03	-1.15	-11.49	-2.28	0.00	-0.62	-0.01	0.14	0.38	0.70	-0.86
2011.4	-2.33	-0.15	-1.45	-13.49	-3.35	0.02	-0.86	-0.10	0.21	0.54	0.97	-1.14
2012.1	-2.53	-0.29	-1.70	-14.90	-4.42	0.00	-1.03	-0.18	0.41	0.68	1.18	-1.52
2012.2	-2.56	-0.45	-1.90	-15.52	-5.41	0.04	-1.14	-0.31	0.48	0.83	1.31	-1.99
2012.3	-2.49	-0.61	-2.05	-15.46	-6.27	0.08	-1.19	-0.44	0.54	0.95	1.36	-2.53
2012.4	-2.34	-0.76	-2.16	-14.92	-6.98	0.13	-1.20	-0.55	0.58	1.06	1.34	-3.13
2013.1	-2.18	-0.88	-2.24	-14.11	-7.53	0.10	-1.15	-0.64	0.67	1.13	1.28	-3.76
2013.2	-1.99	-0.98	-2.29	-13.09	-7.93	0.13	-1.09	-0.72	0.67	1.20	1.18	-4.43
2013.3	-1.81	-1.05	-2.33	-11.96	-8.19	0.16	-1.01	-0.79	0.65	1.25	1.06	-5.12
2013.4	-1.64	-1.10	-2.35	-10.82	-8.33	0.17	-0.92	-0.83	0.61	1.29	0.94	-5.83
2014.1	-1.50	-1.13	-2.37	-9.72	-8.36	0.10	-0.84	-0.88	0.45	1.33	0.82	-6.53
2014.2	-1.38	-1.15	-2.38	-8.68	-8.31	0.08	-0.76	-0.91	0.37	1.34	0.72	-7.24
2014.3	-1.27	-1.15	-2.39	-7.72	-8.19	0.06	-0.68	-0.92	0.28	1.34	0.63	-7.95
2014.4	-1.19	-1.15	-2.40	-6.85	-8.04	0.02	-0.62	-0.93	0.18	1.34	0.55	-8.67
2015.1	-1.13	-1.15	-2.40	-6.07	-7.84	-0.08	-0.58	-0.97	-0.11	1.36	0.49	-9.37
2015.2	-1.08	-1.14	-2.41	-5.37	-7.62	-0.13	-0.54	-0.98	-0.21	1.34	0.45	-10.07
2015.3	-1.04	-1.14	-2.42	-4.76	-7.39	-0.19	-0.51	-0.99	-0.30	1.32	0.42	-10.77
2015.4	-1.01	-1.13	-2.44	-4.22	-7.17	-0.24	-0.48	-1.00	-0.39	1.30	0.40	-11.46
2016.1	-1.00	-1.14	-2.45	-3.74	-6.95	-0.33	-0.48	-1.04	-0.64	1.32	0.39	-12.14
2016.2	-0.99	-1.15	-2.47	-3.33	-6.74	-0.39	-0.48	-1.06	-0.71	1.29	0.39	-12.82
2016.3	-0.99	-1.16	-2.48	-2.98	-6.55	-0.44	-0.48	-1.08	-0.78	1.26	0.40	-13.49
2016.4	-0.99	-1.17	-2.51	-2.68	-6.38	-0.48	-0.48	-1.10	-0.83	1.24	0.41	-14.16
2017.1	-1.00	-1.20	-2.53	-2.43	-6.22	-0.54	-0.49	-1.15	-0.97	1.25	0.43	-14.82
2017.2	-1.00	-1.22	-2.55	-2.22	-6.09	-0.57	-0.51	-1.17	-1.01	1.23	0.44	-15.48
2017.3	-1.02	-1.25	-2.58	-2.05	-5.98	-0.60	-0.52	-1.20	-1.03	1.21	0.46	-16.14
2017.4	-1.03	-1.28	-2.61	-1.92	-5.89	-0.62	-0.53	-1.23	-1.05	1.20	0.49	-16.79
2018.1	-1.04	-1.31	-2.64	-1.82	-5.83	-0.63	-0.55	-1.26	-1.08	1.22	0.51	-17.43
2018.2	-1.05	-1.34	-2.67	-1.75	-5.79	-0.64	-0.56	-1.29	-1.07	1.21	0.53	-18.08
2018.3	-1.06	-1.38	-2.70	-1.70	-5.77	-0.63	-0.58	-1.32	-1.07	1.21	0.55	-18.72
2018.4	-1.07	-1.41	-2.73	-1.68	-5.76	-0.62	-0.59	-1.35	-1.05	1.21	0.57	-19.36
2019.1	-1.08	-1.44	-2.77	-1.68	-5.78	-0.60	-0.61	-1.37	-1.00	1.24	0.59	-19.99
2019.2	-1.09	-1.47	-2.81	-1.69	-5.81	-0.58	-0.62	-1.39	-0.98	1.25	0.61	-20.63
2019.3	-1.10	-1.50	-2.84	-1.72	-5.86	-0.55	-0.63	-1.42	-0.95	1.26	0.63	-21.26
2019.4	-1.11	-1.53	-2.88	-1.76	-5.92	-0.51	-0.64	-1.44	-0.93	1.28	0.65	-21.89
2020.1	-1.11	-1.56	-2.92	-1.81	-5.99	-0.47	-0.65	-1.45	-0.83	1.32	0.66	-22.52
2020.2	-1.12	-1.58	-2.96	-1.87	-6.07	-0.43	-0.66	-1.46	-0.81	1.34	0.68	-23.15
2020.3	-1.12	-1.61	-3.00	-1.93	-6.16	-0.39	-0.67	-1.48	-0.78	1.38	0.69	-23.77
2020.4	-1.12	-1.63	-3.04	-1.99	-6.26	-0.34	-0.68	-1.50	-0.75	1.41	0.71	-24.39

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

7.5 Run 6: National Sales Tax

Tables 7.5a and 7.5b present selected results for the United States. Table 7.5a gives results in terms of the levels of the variables, and Table 7.5b gives results in terms of differences from the baseline run. If you use the MCF model for this experiment, you will duplicate the results in these tables.

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

2. Click "Set prediction period" and set the period to be 2011 through 2020.

3. Click "Examine the results without solving the model." List the values of GDP, $IBTG$, PCS, CS, PCN, CN, PCD, CD, and $IBTS$ for 2011:1–2020:4. Compute for each quarter:

   $$D3G^{new} = (IBTG + .03 \cdot GDP)/(PCS \cdot CS + PCN \cdot CN + PCD \cdot CD - IBTS - IBTG - .03 \cdot GDP)$$

   Then return to the main menu page.

4. Click "Change exogenous variables" and ask to change $D3G$ for the United States. Type in the $D3G^{new}$ values quarter by quarter. Be sure to save the changes once you are done.

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

This experiment is Run 6 in Table 3 in the paper.

Table 7.5a
Results for the United States
Predicted Levels
Percentage Points

qtr	g	π	RS	SPCT	UR	DEF	DEBT
2011.1	2.23	4.89	0.28	-2.74	9.35	5.94	53.50
2011.2	1.50	4.99	0.31	-2.32	9.35	6.25	56.22
2011.3	0.78	5.03	0.14	-1.84	9.46	6.51	58.90
2011.4	0.15	5.51	0.00	-1.40	9.59	6.04	61.30
2012.1	0.05	2.25	0.00	-1.03	9.70	5.17	62.43
2012.2	0.88	2.22	0.00	-0.63	9.76	5.23	63.09
2012.3	1.81	2.24	0.00	-0.28	9.72	5.20	63.54
2012.4	2.68	2.29	0.07	0.01	9.58	5.06	63.83
2013.1	3.46	2.37	0.25	0.21	9.38	4.79	63.99
2013.2	4.11	2.52	0.48	0.40	9.11	4.64	64.00
2013.3	4.53	2.71	0.74	0.54	8.80	4.47	63.89
2013.4	4.75	2.93	1.04	0.63	8.45	4.30	63.71
2014.1	4.87	3.13	1.33	0.70	8.12	4.15	63.52
2014.2	4.79	3.33	1.61	0.73	7.80	4.00	63.30
2014.3	4.59	3.51	1.87	0.74	7.52	3.88	63.06
2014.4	4.34	3.65	2.11	0.74	7.28	3.77	62.83
2015.1	4.09	3.73	2.29	0.77	7.09	3.68	62.63
2015.2	3.85	3.78	2.44	0.73	6.93	3.61	62.44
2015.3	3.62	3.79	2.57	0.70	6.82	3.55	62.27
2015.4	3.42	3.77	2.67	0.66	6.74	3.50	62.11
2016.1	3.26	3.71	2.73	0.69	6.69	3.47	61.99
2016.2	3.12	3.65	2.77	0.65	6.66	3.44	61.89
2016.3	3.00	3.57	2.81	0.62	6.65	3.43	61.81
2016.4	2.91	3.48	2.83	0.60	6.65	3.41	61.75
2017.1	2.84	3.39	2.82	0.64	6.67	3.40	61.71
2017.2	2.79	3.31	2.81	0.63	6.69	3.40	61.68
2017.3	2.75	3.23	2.80	0.63	6.71	3.39	61.66
2017.4	2.73	3.16	2.79	0.64	6.73	3.39	61.64
2018.1	2.72	3.10	2.78	0.71	6.75	3.38	61.64
2018.2	2.72	3.05	2.76	0.73	6.77	3.38	61.64
2018.3	2.72	3.00	2.75	0.77	6.79	3.37	61.64
2018.4	2.73	2.97	2.74	0.81	6.80	3.36	61.63
2019.1	2.75	2.95	2.74	0.90	6.81	3.35	61.62
2019.2	2.76	2.93	2.74	0.97	6.81	3.33	61.60
2019.3	2.79	2.92	2.74	1.04	6.80	3.31	61.58
2019.4	2.81	2.92	2.75	1.12	6.80	3.29	61.54
2020.1	2.84	2.92	2.77	1.22	6.78	3.26	61.49
2020.2	2.87	2.93	2.79	1.32	6.76	3.23	61.43
2020.3	2.90	2.94	2.81	1.42	6.74	3.19	61.35
2020.4	2.93	2.96	2.83	1.53	6.71	3.15	61.25

- **g** = real GDP, four quarter percent change.
- π = GDP deflator, four quarter percent change.
- **RS** = three-month Treasury bill rate.
- **SPCT** = current account as a percent of GDP.
- **UR** = unemployment rate.
- **DEF** = federal government deficit as a percent of GDP.
- **DEBT** = federal government debt as a percent of GDP.

Table 7.5b
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2011.1	-0.94	3.28	-0.61	-6.95	-0.73	-0.27	-0.21	2.92	0.43	0.58	0.16	-1.77
2011.2	-2.24	3.30	-1.44	-13.26	-2.08	-0.39	-0.56	2.96	0.57	0.79	0.61	-1.56
2011.3	-3.35	3.21	-2.18	-18.05	-3.81	-0.47	-1.02	2.91	0.74	1.04	1.15	-1.26
2011.4	-4.11	3.02	-2.80	-21.60	-5.70	-0.51	-1.41	2.78	0.92	1.31	1.66	-1.02
2012.1	-4.55	2.79	-3.31	-24.20	-7.62	-0.66	-1.64	2.67	1.46	1.52	2.08	-0.90
2012.2	-4.69	2.51	-3.71	-25.53	-9.41	-0.64	-1.83	2.46	1.63	1.78	2.36	-0.93
2012.3	-4.61	2.22	-4.01	-25.65	-10.98	-0.60	-1.99	2.23	1.78	2.00	2.49	-1.10
2012.4	-4.39	1.95	-4.23	-24.89	-12.27	-0.55	-2.05	2.02	1.92	2.19	2.50	-1.38
2013.1	-4.10	1.73	-4.37	-23.63	-13.30	-0.66	-2.00	1.88	2.24	2.30	2.40	-1.76
2013.2	-3.77	1.55	-4.46	-21.94	-14.04	-0.60	-1.89	1.74	2.31	2.42	2.23	-2.21
2013.3	-3.43	1.42	-4.51	-20.02	-14.54	-0.56	-1.75	1.63	2.34	2.51	2.02	-2.72
2013.4	-3.11	1.33	-4.53	-18.05	-14.81	-0.53	-1.59	1.57	2.33	2.57	1.79	-3.28
2014.1	-2.85	1.30	-4.53	-16.15	-14.89	-0.69	-1.43	1.52	2.23	2.62	1.57	-3.83
2014.2	-2.60	1.30	-4.52	-14.33	-14.82	-0.70	-1.26	1.51	2.14	2.63	1.35	-4.42
2014.3	-2.39	1.32	-4.51	-12.63	-14.63	-0.73	-1.11	1.52	2.03	2.63	1.16	-5.01
2014.4	-2.21	1.37	-4.49	-11.08	-14.35	-0.78	-0.97	1.54	1.89	2.62	0.99	-5.61
2015.1	-2.08	1.42	-4.47	-9.67	-13.99	-0.99	-0.87	1.52	1.44	2.65	0.85	-6.19
2015.2	-1.96	1.48	-4.45	-8.39	-13.59	-1.08	-0.78	1.55	1.28	2.61	0.74	-6.77
2015.3	-1.86	1.54	-4.44	-7.24	-13.16	-1.18	-0.70	1.58	1.11	2.57	0.66	-7.35
2015.4	-1.79	1.61	-4.42	-6.22	-12.72	-1.28	-0.63	1.61	0.95	2.52	0.59	-7.92
2016.1	-1.74	1.64	-4.41	-5.31	-12.26	-1.48	-0.60	1.57	0.48	2.53	0.55	-8.46
2016.2	-1.71	1.68	-4.40	-4.50	-11.82	-1.60	-0.58	1.58	0.34	2.47	0.52	-9.00
2016.3	-1.68	1.72	-4.39	-3.79	-11.40	-1.71	-0.55	1.59	0.21	2.41	0.51	-9.53
2016.4	-1.66	1.74	-4.38	-3.18	-11.00	-1.81	-0.54	1.59	0.10	2.35	0.50	-10.05
2017.1	-1.66	1.75	-4.37	-2.65	-10.63	-1.96	-0.55	1.55	-0.20	2.36	0.51	-10.54
2017.2	-1.66	1.75	-4.36	-2.20	-10.28	-2.05	-0.56	1.54	-0.28	2.31	0.52	-11.03
2017.3	-1.66	1.75	-4.36	-1.82	-9.97	-2.13	-0.56	1.53	-0.34	2.25	0.54	-11.52
2017.4	-1.67	1.75	-4.36	-1.51	-9.70	-2.20	-0.57	1.52	-0.38	2.20	0.56	-11.99
2018.1	-1.68	1.73	-4.36	-1.27	-9.47	-2.27	-0.59	1.49	-0.48	2.21	0.58	-12.45
2018.2	-1.69	1.72	-4.36	-1.08	-9.26	-2.32	-0.61	1.47	-0.49	2.17	0.60	-12.91
2018.3	-1.71	1.70	-4.36	-0.94	-9.09	-2.36	-0.62	1.45	-0.49	2.14	0.62	-13.36
2018.4	-1.72	1.68	-4.37	-0.85	-8.96	-2.38	-0.63	1.44	-0.47	2.11	0.64	-13.80
2019.1	-1.73	1.66	-4.37	-0.81	-8.86	-2.39	-0.65	1.43	-0.40	2.12	0.66	-14.24
2019.2	-1.75	1.65	-4.38	-0.80	-8.79	-2.39	-0.66	1.42	-0.36	2.11	0.68	-14.68
2019.3	-1.76	1.63	-4.40	-0.83	-8.75	-2.38	-0.67	1.41	-0.31	2.10	0.70	-15.11
2019.4	-1.77	1.62	-4.41	-0.89	-8.73	-2.36	-0.68	1.41	-0.26	2.10	0.72	-15.54
2020.1	-1.78	1.61	-4.43	-0.98	-8.74	-2.32	-0.68	1.43	-0.08	2.12	0.73	-15.97
2020.2	-1.78	1.60	-4.44	-1.09	-8.77	-2.28	-0.69	1.43	-0.02	2.14	0.75	-16.39
2020.3	-1.79	1.60	-4.46	-1.21	-8.81	-2.24	-0.70	1.44	0.04	2.16	0.76	-16.81
2020.4	-1.79	1.59	-4.48	-1.34	-8.87	-2.20	-0.70	1.44	0.11	2.19	0.77	-17.23

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 8

Experiments in "Estimated Macroeconomic Effects of a Chinese Yuan Appreciation."

This chapter presents two of the experiments in Fair (2010b), "Estimated Macroeconomic Effects of a Chinese Yuan Appreciation." The first experiment is the one in Table 1 of the paper, and the second experiment is the one in Table 4. If you do the following experiments using the MCE model on the website, you will exactly duplicate the results in this paper. This will not be true for the MCF model since the MCE and MCF models differ somewhat.

8.1 Yuan Appreciation: Full Version of the Model

Table 8.1a presents selected results for the United States, and Table 8.1b presents selected results for China. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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.)

Table 8.1a
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1999.1	-0.01	0.06	-0.02	-0.10	-0.08	-0.02	0.04	0.17	0.96	-0.14	0.00	-0.02
1999.2	-0.03	0.10	-0.04	-0.20	-0.15	-0.02	0.06	0.20	0.91	-0.12	0.01	-0.02
1999.3	-0.05	0.13	-0.06	-0.26	-0.21	-0.02	0.04	0.23	0.92	-0.10	0.02	-0.02
1999.4	-0.06	0.16	-0.07	-0.30	-0.27	-0.03	0.03	0.25	0.90	-0.09	0.03	-0.02
2000.1	-0.06	0.17	-0.08	-0.30	-0.31	-0.02	0.02	0.25	0.74	-0.05	0.03	-0.02
2000.2	-0.06	0.19	-0.09	-0.27	-0.34	-0.04	0.02	0.26	0.72	-0.05	0.03	-0.02
2000.3	-0.06	0.20	-0.10	-0.27	-0.36	-0.04	0.02	0.27	0.71	-0.03	0.03	-0.02
2000.4	-0.06	0.21	-0.10	-0.26	-0.38	-0.05	0.02	0.28	0.67	-0.02	0.03	-0.02
2001.1	-0.05	0.22	-0.10	-0.24	-0.39	-0.03	0.02	0.28	0.64	-0.01	0.03	-0.02
2001.2	-0.05	0.23	-0.10	-0.23	-0.39	-0.04	0.01	0.28	0.64	-0.01	0.03	-0.01
2001.3	-0.05	0.24	-0.11	-0.21	-0.40	-0.03	0.02	0.29	0.67	-0.01	0.03	-0.01
2001.4	-0.05	0.25	-0.11	-0.20	-0.40	-0.03	0.02	0.30	0.68	-0.01	0.03	-0.01
2002.1	-0.04	0.26	-0.11	-0.19	-0.40	0.00	0.02	0.31	0.71	-0.01	0.03	-0.01
2002.2	-0.04	0.27	-0.11	-0.18	-0.40	-0.02	0.02	0.32	0.72	-0.01	0.02	-0.01
2002.3	-0.04	0.28	-0.11	-0.17	-0.41	0.00	0.02	0.34	0.75	-0.01	0.02	-0.01
2002.4	-0.04	0.29	-0.11	-0.16	-0.41	0.00	0.02	0.35	0.78	-0.02	0.02	-0.01
2003.1	-0.04	0.30	-0.11	-0.16	-0.41	-0.01	0.02	0.37	0.81	-0.02	0.02	-0.01
2003.2	-0.04	0.32	-0.11	-0.16	-0.42	0.00	0.02	0.39	0.86	-0.02	0.02	-0.01
2003.3	-0.04	0.33	-0.12	-0.15	-0.43	-0.01	0.02	0.40	0.89	-0.02	0.02	-0.01
2003.4	-0.04	0.35	-0.12	-0.16	-0.44	-0.03	0.03	0.43	0.95	-0.04	0.02	-0.01
2004.1	-0.05	0.36	-0.12	-0.17	-0.45	-0.06	0.03	0.44	0.96	-0.04	0.02	-0.01
2004.2	-0.04	0.38	-0.13	-0.17	-0.46	-0.01	0.03	0.46	0.99	-0.03	0.02	-0.01
2004.3	-0.04	0.39	-0.13	-0.16	-0.46	0.00	0.03	0.47	1.00	-0.03	0.02	-0.01
2004.4	-0.04	0.41	-0.13	-0.15	-0.48	0.02	0.03	0.50	1.07	-0.04	0.02	-0.02
2005.1	-0.04	0.43	-0.14	-0.16	-0.49	0.00	0.03	0.52	1.12	-0.04	0.02	-0.02
2005.2	-0.05	0.45	-0.14	-0.16	-0.50	-0.05	0.03	0.54	1.14	-0.05	0.02	-0.01
2005.3	-0.05	0.46	-0.15	-0.17	-0.51	-0.05	0.03	0.55	1.14	-0.04	0.03	-0.01
2005.4	-0.05	0.48	-0.15	-0.17	-0.52	-0.05	0.03	0.57	1.16	-0.05	0.03	-0.01
2006.1	-0.04	0.49	-0.15	-0.16	-0.53	-0.01	0.03	0.59	1.22	-0.06	0.03	-0.01
2006.2	-0.04	0.51	-0.16	-0.15	-0.54	0.01	0.03	0.61	1.23	-0.05	0.03	-0.01
2006.3	-0.04	0.52	-0.16	-0.15	-0.55	0.02	0.03	0.63	1.26	-0.05	0.02	-0.01
2006.4	-0.04	0.54	-0.16	-0.16	-0.57	0.02	0.03	0.65	1.34	-0.06	0.02	-0.01
2007.1	-0.03	0.56	-0.17	-0.15	-0.58	0.06	0.04	0.68	1.40	-0.06	0.02	-0.01
2007.2	-0.03	0.58	-0.17	-0.14	-0.59	0.05	0.04	0.70	1.39	-0.05	0.02	-0.01
2007.3	-0.03	0.60	-0.18	-0.13	-0.60	0.06	0.04	0.72	1.41	-0.04	0.02	-0.01
2007.4	-0.04	0.62	-0.18	-0.13	-0.61	0.02	0.03	0.74	1.42	-0.05	0.02	-0.01
2008.1	-0.04	0.63	-0.18	-0.12	-0.62	0.06	0.03	0.76	1.44	-0.04	0.02	-0.02
2008.2	-0.03	0.65	-0.19	-0.12	-0.62	0.07	0.03	0.78	1.45	-0.02	0.02	-0.02
2008.3	-0.03	0.66	-0.19	-0.10	-0.63	0.12	0.03	0.79	1.47	-0.01	0.02	-0.02
2008.4	-0.03	0.67	-0.19	-0.11	-0.64	0.11	0.03	0.80	1.52	-0.03	0.02	-0.01

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Table 8.1b
Results for China
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	none	PX	PM	SPCT	none
1999	-0.67	-0.38	-0.21	-0.45	-0.16	-1.99	0.00	0.00	-13.46	-24.88	1.71	99.00
2000	-1.60	-7.89	-0.64	-1.27	-0.55	-3.76	0.00	0.00	-16.79	-24.87	1.25	99.00
2001	-2.22	-11.38	-1.10	-2.03	-1.06	-4.93	0.00	0.00	-18.36	-24.85	0.81	99.00
2002	-2.86	-13.21	-1.58	-2.77	-1.66	-5.69	0.00	0.00	-19.18	-24.81	0.62	99.00
2003	-3.65	-14.41	-2.13	-3.62	-2.38	-6.40	0.00	0.00	-19.69	-24.77	0.68	99.00
2004	-4.22	-15.21	-2.65	-4.35	-3.12	-6.70	0.00	0.00	-20.03	-24.73	0.82	99.00
2005	-4.66	-15.77	-3.10	-4.96	-3.80	-7.06	0.00	0.00	-20.25	-24.70	0.52	99.00
2007	-5.15	-16.42	-3.76	-5.73	-4.89	-7.60	0.00	0.00	-20.46	-24.61	0.34	99.00
2008	-5.39	-16.65	-4.02	-6.03	-5.33	-8.32	0.00	0.00	-20.53	-24.58	0.37	99.00

• percentage deviations for all but **RS** and **SPCT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment, **IM** = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate, **PX** = export price index, **PM** = import price index, **SPCT** = current account as a percent of GDP.

8.2 Yuan Appreciation: Chinese PY Equation Dropped

Table 8.2a presents selected results for the United States, and Table 8.2b presents selected results for China. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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.

Table 8.2a
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
1999.1	-0.01	0.06	-0.02	-0.10	-0.08	-0.02	0.05	0.17	0.97	-0.14	0.00	-0.02
1999.2	-0.03	0.10	-0.04	-0.20	-0.15	-0.02	0.06	0.20	0.92	-0.12	0.01	-0.02
1999.3	-0.05	0.13	-0.06	-0.26	-0.22	-0.02	0.04	0.24	0.93	-0.11	0.02	-0.02
1999.4	-0.06	0.16	-0.07	-0.31	-0.28	-0.03	0.03	0.26	0.91	-0.09	0.03	-0.02
2000.1	-0.07	0.20	-0.09	-0.33	-0.34	-0.03	0.04	0.30	1.04	-0.10	0.03	-0.02
2000.2	-0.07	0.22	-0.10	-0.34	-0.39	-0.05	0.04	0.33	1.02	-0.09	0.04	-0.02
2000.3	-0.08	0.25	-0.12	-0.36	-0.43	-0.05	0.04	0.35	1.00	-0.07	0.04	-0.02
2000.4	-0.08	0.26	-0.13	-0.36	-0.47	-0.07	0.03	0.36	0.94	-0.05	0.04	-0.02
2001.1	-0.08	0.29	-0.14	-0.37	-0.50	-0.06	0.03	0.39	1.09	-0.06	0.04	-0.02
2001.2	-0.08	0.31	-0.14	-0.37	-0.54	-0.06	0.03	0.41	1.08	-0.05	0.04	-0.02
2001.3	-0.08	0.33	-0.15	-0.38	-0.57	-0.05	0.03	0.44	1.13	-0.05	0.04	-0.02
2001.4	-0.08	0.35	-0.15	-0.38	-0.59	-0.06	0.03	0.46	1.15	-0.04	0.04	-0.01
2002.1	-0.08	0.38	-0.16	-0.39	-0.62	-0.03	0.04	0.50	1.34	-0.06	0.04	-0.02
2002.2	-0.08	0.41	-0.17	-0.40	-0.65	-0.06	0.04	0.53	1.34	-0.06	0.04	-0.02
2002.3	-0.08	0.44	-0.18	-0.40	-0.68	-0.05	0.04	0.56	1.40	-0.06	0.05	-0.02
2002.4	-0.08	0.47	-0.19	-0.41	-0.71	-0.05	0.04	0.59	1.45	-0.06	0.04	-0.02
2003.1	-0.09	0.50	-0.20	-0.43	-0.75	-0.08	0.05	0.65	1.63	-0.08	0.05	-0.01
2003.2	-0.10	0.54	-0.21	-0.44	-0.78	-0.07	0.05	0.69	1.71	-0.08	0.05	-0.02
2003.3	-0.10	0.57	-0.22	-0.45	-0.82	-0.08	0.05	0.72	1.77	-0.08	0.05	-0.02
2003.4	-0.11	0.61	-0.23	-0.46	-0.86	-0.12	0.05	0.77	1.88	-0.10	0.06	-0.02
2004.1	-0.12	0.65	-0.24	-0.50	-0.90	-0.18	0.06	0.82	2.00	-0.11	0.06	-0.01
2004.2	-0.12	0.69	-0.25	-0.50	-0.94	-0.13	0.06	0.86	2.06	-0.10	0.06	-0.01
2004.3	-0.11	0.72	-0.27	-0.50	-0.98	-0.12	0.06	0.90	2.08	-0.09	0.06	-0.01
2004.4	-0.11	0.77	-0.28	-0.50	-1.02	-0.10	0.06	0.96	2.23	-0.12	0.06	-0.02
2005.1	-0.12	0.82	-0.29	-0.51	-1.07	-0.15	0.08	1.02	2.43	-0.14	0.06	-0.02
2005.2	-0.13	0.86	-0.30	-0.53	-1.11	-0.22	0.07	1.07	2.47	-0.14	0.07	-0.01
2005.3	-0.14	0.89	-0.32	-0.53	-1.15	-0.24	0.06	1.10	2.47	-0.12	0.07	-0.01
2005.4	-0.14	0.94	-0.33	-0.53	-1.18	-0.24	0.06	1.15	2.54	-0.15	0.07	0.00
2006.1	-0.14	0.99	-0.34	-0.53	-1.23	-0.21	0.07	1.22	2.76	-0.18	0.07	-0.01
2006.2	-0.13	1.03	-0.35	-0.53	-1.26	-0.19	0.08	1.26	2.77	-0.15	0.07	0.00
2006.3	-0.13	1.07	-0.36	-0.53	-1.30	-0.19	0.07	1.31	2.84	-0.15	0.07	0.00
2006.4	-0.14	1.12	-0.38	-0.55	-1.34	-0.17	0.08	1.37	3.03	-0.19	0.08	0.00
2007.1	-0.13	1.18	-0.39	-0.56	-1.39	-0.13	0.09	1.44	3.23	-0.20	0.07	0.00
2007.2	-0.14	1.22	-0.40	-0.55	-1.43	-0.16	0.09	1.50	3.19	-0.17	0.07	0.00
2007.3	-0.13	1.27	-0.42	-0.54	-1.46	-0.14	0.08	1.55	3.24	-0.15	0.07	0.00
2007.4	-0.14	1.31	-0.42	-0.53	-1.49	-0.21	0.07	1.59	3.26	-0.15	0.07	0.00
2008.1	-0.14	1.36	-0.43	-0.52	-1.52	-0.16	0.07	1.65	3.36	-0.15	0.08	0.00
2008.2	-0.14	1.40	-0.45	-0.51	-1.55	-0.15	0.07	1.70	3.39	-0.11	0.08	0.00
2008.3	-0.13	1.43	-0.46	-0.49	-1.57	-0.06	0.08	1.74	3.45	-0.08	0.08	0.00
2008.4	-0.14	1.47	-0.47	-0.52	-1.60	-0.07	0.07	1.78	3.61	-0.13	0.08	0.04

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment, **IM** = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate, **PX** = export price index, **PM** = import price index, **SPCT** = current account as a percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Table 8.2b
Results for China
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	none	PX	PM	SPCT	none
1999	-0.68	0.00	-0.22	-0.46	-0.16	-2.01	0.00	0.00	-13.29	-24.87	1.72	99.00
2000	-1.81	0.00	-0.71	-1.41	-0.60	-4.29	0.00	0.00	-13.26	-24.83	1.67	99.00
2001	-2.78	0.00	-1.32	-2.47	-1.25	-6.31	0.00	0.00	-13.22	-24.77	1.34	99.00
2002	-3.92	0.00	-2.06	-3.67	-2.10	-7.99	0.00	0.00	-13.15	-24.70	1.08	99.00
2003	-5.42	0.00	-2.99	-5.19	-3.24	-9.67	0.00	0.00	-13.06	-24.60	1.19	99.00
2004	-6.68	0.00	-3.97	-6.66	-4.53	-10.74	0.00	0.00	-12.96	-24.50	1.38	99.00
2005	-7.83	0.00	-4.93	-8.05	-5.83	-11.96	0.00	0.00	-12.86	-24.41	0.69	99.00
2006	-8.77	0.00	-5.82	-9.25	-7.11	-13.03	0.00	0.00	-12.74	-24.30	0.29	99.00
2007	-9.50	0.00	-6.60	-10.24	-8.26	-14.03	0.00	0.00	-12.59	-24.18	0.00	99.00
2008	-10.32	0.00	-7.34	-11.20	-9.38	-15.95	0.00	0.00	-12.48	-24.09	0.05	99.00

• percentage deviations for all but **RS** and **SPCT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment, **IM** = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate, **PX** = export price index, **PM** = import price index, **SPCT** = current account as a percent of GDP.

Chapter 9

Experiments in "Estimated Macroeconomic Effects of the U.S. Stimulus Bill."

This chapter presents the stimulus experiment in Fair (2010c), "Estimated Macroeconomic Effects of the U.S. Stimulus Bill." If you do the following experiments using the MCE model on the website, you will exactly duplicate the results in Table 4 in this paper. This will not be true for the MCF model since the MCE and MCF models differ somewhat. The MCF model forecast is the baseline forecast for this experiment.

9.1 Stimulus Experiment

Table 9.1 presents selected results for the United States. If you use the MCF model for this experiment, you will duplicate the results in this table.

1. Click "Solve" under "MCF Model" in the left menu and copy MCFBASE 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	-72.7
2009.3	-84.1
2009.4	-84.1
2010.1	-84.1
2010.2	-84.1
2010.3	-84.1
2010.4	-23.4
2011.1	-23.4
2011.2	-23.4
2011.3	-23.4
2011.4	-2.6
2012.1	-2.6
2012.2	-2.6
2012.3	-2.6
2012.4	-2.5

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

	COG
2009.2	-5.0
2009.3	-7.0
2009.4	-6.9
2010.1	-6.9
2010.2	-6.9
2010.3	-6.8
2010.4	-7.3
2011.1	-7.2
2011.2	-7.2
2011.3	-7.1
2011.4	-5.5
2012.1	-5.4
2012.2	-5.4
2012.3	-5.3
2012.4	-3.6

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 of the paper; they are not reversed in Table 9.1.

Table 9.1
Results for the United States
Predicted Values Divided By or Subtracted From Baseline Values
Percentage Points

qtr	Y	PY	C	I	IM	EX	RS	PX	PM	SPCT	UR	DEBT
2009.1	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
2009.2	-0.64	0.02	-0.31	-4.17	-0.39	-0.01	-0.11	0.02	0.01	0.06	0.14	-0.31
2009.3	-1.43	-0.01	-0.66	-8.66	-1.11	-0.01	-0.16	0.00	0.03	0.18	0.41	-0.59
2009.4	-2.07	-0.11	-1.02	-12.32	-2.05	0.00	-0.06	-0.09	0.02	0.33	0.72	-0.86
2010.1	-2.52	-0.24	-1.33	-15.10	-3.09	-0.03	-0.11	-0.21	-0.06	0.51	1.03	-1.14
2010.2	-2.74	-0.42	-1.61	-16.61	-4.15	-0.02	-0.15	-0.38	-0.09	0.71	1.26	-1.42
2010.3	-2.80	-0.61	-1.84	-17.91	-5.17	-0.01	-0.16	-0.55	-0.12	0.90	1.43	-1.78
2010.4	-2.43	-0.83	-1.77	-15.58	-5.80	0.01	-0.14	-0.74	-0.16	0.94	1.41	-1.89
2011.1	-1.90	-1.03	-1.66	-12.80	-6.10	-0.02	-0.19	-0.93	-0.28	0.97	1.28	-2.09
2011.2	-1.39	-1.16	-1.53	-10.16	-6.13	-0.01	-0.17	-1.05	-0.30	0.95	1.07	-2.36
2011.3	-0.98	-1.25	-1.39	-7.64	-5.97	0.00	-0.06	-1.13	-0.34	0.91	0.83	-2.64
2011.4	-0.49	-1.30	-1.18	-4.54	-5.55	0.00	0.10	-1.18	-0.39	0.83	0.55	-2.87
2012.1	-0.11	-1.30	-0.98	-2.03	-4.96	-0.04	0.25	-1.20	-0.58	0.75	0.28	-3.12
2012.2	0.15	-1.25	-0.80	-0.08	-4.28	-0.07	0.39	-1.17	-0.65	0.64	0.04	-3.35
2012.3	0.31	-1.18	-0.65	1.40	-3.57	-0.10	0.49	-1.12	-0.72	0.54	-0.14	-3.55
2012.4	0.44	-1.08	-0.52	2.55	-2.86	-0.14	0.57	-1.05	-0.78	0.43	-0.28	-3.73
2013.1	0.60	-0.99	-0.41	3.60	-2.15	-0.20	0.63	-0.99	-0.94	0.34	-0.39	-3.90
2013.2	0.65	-0.88	-0.32	4.26	-1.48	-0.25	0.68	-0.91	-0.99	0.24	-0.47	-4.02
2013.3	0.63	-0.78	-0.25	4.60	-0.89	-0.30	0.69	-0.83	-1.03	0.15	-0.49	-4.08
2013.4	0.57	-0.69	-0.20	4.75	-0.37	-0.35	0.67	-0.75	-1.05	0.07	-0.48	-4.12
2014.1	0.50	-0.61	-0.17	4.73	0.06	-0.38	0.63	-0.68	-1.07	0.01	-0.45	-4.12
2014.2	0.42	-0.54	-0.14	4.60	0.41	-0.43	0.58	-0.63	-1.07	-0.05	-0.39	-4.11
2014.3	0.34	-0.49	-0.13	4.39	0.69	-0.46	0.52	-0.58	-1.05	-0.11	-0.33	-4.09
2014.4	0.27	-0.45	-0.12	4.13	0.89	-0.49	0.46	-0.54	-1.03	-0.15	-0.27	-4.05
2015.1	0.21	-0.42	-0.12	3.86	1.02	-0.48	0.41	-0.50	-0.93	-0.19	-0.21	-4.01
2015.2	0.15	-0.40	-0.12	3.58	1.10	-0.49	0.36	-0.48	-0.89	-0.21	-0.15	-3.96
2015.3	0.11	-0.39	-0.12	3.30	1.14	-0.49	0.31	-0.46	-0.85	-0.23	-0.10	-3.91
2015.4	0.07	-0.38	-0.13	3.03	1.14	-0.49	0.26	-0.45	-0.80	-0.24	-0.06	-3.86
2016.1	0.04	-0.37	-0.13	2.76	1.11	-0.44	0.22	-0.43	-0.66	-0.25	-0.02	-3.81
2016.2	0.01	-0.37	-0.14	2.51	1.06	-0.43	0.19	-0.42	-0.61	-0.25	0.01	-3.75
2016.3	-0.01	-0.37	-0.14	2.28	0.99	-0.41	0.16	-0.41	-0.57	-0.25	0.03	-3.70
2016.4	-0.03	-0.37	-0.15	2.05	0.92	-0.39	0.13	-0.41	-0.53	-0.24	0.05	-3.64
2017.1	-0.04	-0.37	-0.15	1.84	0.83	-0.34	0.12	-0.39	-0.39	-0.24	0.06	-3.60
2017.2	-0.05	-0.37	-0.15	1.63	0.73	-0.31	0.10	-0.38	-0.36	-0.22	0.07	-3.55
2017.3	-0.06	-0.36	-0.16	1.44	0.64	-0.28	0.08	-0.37	-0.32	-0.20	0.08	-3.50
2017.4	-0.07	-0.36	-0.16	1.26	0.55	-0.25	0.07	-0.36	-0.29	-0.19	0.08	-3.46
2018.1	-0.07	-0.35	-0.16	1.09	0.45	-0.21	0.06	-0.34	-0.19	-0.18	0.09	-3.42
2018.2	-0.07	-0.35	-0.16	0.93	0.36	-0.18	0.05	-0.33	-0.17	-0.16	0.09	-3.37
2018.3	-0.08	-0.34	-0.16	0.77	0.27	-0.15	0.04	-0.32	-0.15	-0.13	0.09	-3.33
2018.4	-0.08	-0.33	-0.16	0.63	0.19	-0.13	0.04	-0.31	-0.13	-0.11	0.09	-3.30
2019.1	-0.08	-0.32	-0.16	0.49	0.11	-0.10	0.03	-0.30	-0.08	-0.10	0.09	-3.26
2019.2	-0.08	-0.31	-0.16	0.37	0.04	-0.08	0.03	-0.29	-0.07	-0.08	0.09	-3.22
2019.3	-0.08	-0.31	-0.16	0.25	-0.03	-0.06	0.02	-0.28	-0.06	-0.06	0.09	-3.19
2019.4	-0.08	-0.30	-0.16	0.14	-0.09	-0.05	0.02	-0.27	-0.06	-0.04	0.09	-3.15
2020.1	-0.08	-0.29	-0.16	0.04	-0.15	-0.03	0.01	-0.26	-0.04	-0.02	0.08	-3.12
2020.2	-0.08	-0.28	-0.16	-0.06	-0.20	-0.02	0.01	-0.25	-0.04	-0.01	0.08	-3.09
2020.3	-0.08	-0.27	-0.15	-0.14	-0.25	-0.02	0.01	-0.25	-0.04	0.01	0.08	-3.06
2020.4	-0.08	-0.27	-0.15	-0.22	-0.29	-0.01	0.00	-0.24	-0.05	0.03	0.08	-3.03

• percentage deviations for all but **RS**, **SPCT**, **UR**, and **DEBT**; absolute deviations for these.
• **Y** = real GDP, **PY** = GDP deflator, **C** = total consumption, **I** = total fixed investment,
IM = total imports, **EX** = total exports, **RS** = three-month Treasury bill rate,
PX = export price index, **PM** = import price index, **SPCT** = current account as a
percent of GDP, **UR** = unemployment rate, **DEBT** = government debt as a percent of GDP.

Chapter 10

Bootstrapping the MCF Model

Bootstrapping is a very useful tool for analyzing the properties of macroeconometric models. Drawing from historically estimated errors does not require any distributional assumptions and avoids having to estimate large variance-covariance matrices. Bootstrapping is discussed in Chapter 9 in Fair (2004), *Estimating How the Macroeconomy Works*.

This chapter explains how standard errors of the MCF model's policy properties can be estimated using bootstrapping. A policy can consist of changing just one exogenous variable or many. The example used here is the stimulus experiment in the previous chapter. The following discussion of the bootstrapping procedure for the stimulus experiment is an update of the discussion in Fair (2010c).

10.1 Bootstrapping the Stimulus Experiment

There are 1,626 estimated equations in the MC model, of which 1,319 are trade share equations. The estimation period for the United States is 1954:1–2010:4. The estimation periods for the other countries begin as early as 1962:1 and end as late as 2010:3. The estimation period for most of the trade share equations is 1966:1–2009:4. For each estimated equation there are estimated residuals over the estimation period. Let $\hat{u}_t$ denote the 1626-dimension vector of the estimated residuals for quarter t.[1] Most of the estimation periods have the 1972:1–2009:4

[1] For equations estimated using annual data, the error is put in the first quarter of the year with zeros in the other three quarters (which are never used). If the initial estimate of an equation suggests that the error term is serially correlated, the equation is reestimated under the assumption that the error term follows an autoregressive process (usually first order). The structural coefficients in the equation and the autoregressive coefficient or coefficients are jointly estimated (by 2SLS). The $\hat{u}_t$ error terms are after adjustment for any autoregressive properties, and they are taken to be iid for purposes of the draws.

period—152 quarters– in common, and this period is taken to be the "base" period. These 152 observations on $\hat{u}_t$ are used for the draws in the bootstrap procedure discussed below.[2]

The solution period used to create new data is 1954:1–2020:4—268 quarters. For a given set of coefficient estimates and error terms, the model can be solved dynamically over this period. Equations enter the solution as data become available. For example, for the period 1954:1–1959:4 only the equations for the United States are used. The links from the other countries to the United States are shut off, and the U.S. variables that these links affect are taken to be exogenous. By 1972 almost all the equations are being used. Actual data for the United States end in 2010:4 and somewhat earlier for the other countries. Exogenous variable values from the end of the actual data through 2020:4 are the ones that were chosen for the baseline forecast made in January 29, 2011, which is the MCF baseline forecast.

Each trial of the bootstrap procedure is as follows. First, 268 error vectors are drawn with replacement from the 152 vectors in the base period. (Each vector consists of 1,626 errors.) Using these errors and the coefficient estimates based on the actual data, the model is solved dynamically over the 1954:1–2020:4 period. Using the solution values as the new data set, the 1,626 equations are reestimated. Given these new coefficient estimates and the new data, the stimulus experiment is performed for the 2009:1–2020:4 period—as in the previous chapter.[3] The multipliers are recorded. This is one trial. The procedure is then repeated, say, N times.

[2] If an estimation period does not include all of the 1972:1–2009:4 period, zero errors are used for the missing quarters.

[3] Given the new data and new coefficient estimates, residuals can be computed for the 2009:1–2020:4 period—1,626 residuals for each quarter. If these residuals are added to the model and the model is solved for the 2009:1–2020:4 period, the solution values reproduce the values in the new data set. This is taken to be the baseline run. These residuals and the no-stimulus values of COG and $TRGHQ$ are then used for the no-stimulus solution. These no-stimulus solution values can then be compared to the values in the new data set to estimate the stimulus effects.

Another procedure for the stimulus experiment is the following. Compute the new data set and new coefficient estimates as above. Then for trial i draw from the historical error distribution (the 152 observations on $\hat{u}_t$) errors for 2009:1–2020:4. Given these errors, the new data set, and the new coefficient estimates, solve the model twice, once using the stimulus values of COG and $TRGHQ$ and once using the no-stimulus values. For each variable and quarter record the difference between the two solution values. Do M trials, which gives M values of each difference. Compute the mean of the M values for each difference, and take this as the expected value of the stimulus effect. This procedure is a bootstrap within a bootstrap. For a linear model this procedure is not necessary because the errors cancel out and so each trial gives exactly the same difference for each variable and quarter. For a nonlinear model (which the MC model is) this is not the case, but a common property of models like the MC model—see Fair (2004)—is that predicted values from deterministic simulations are close to mean values from stochastic simulations. This means in the present context that mean values from the second bootstrap procedure would be close to the values computed using the one set of residuals. This second bootstrap procedure was not used here.

(Note that the coefficient estimates used to generate the new data on each trial are the estimates based on the actual data.) This gives N values of each multiplier, from which measures of dispersion can be computed.

The measure of dispersion used in the stimulus paepr is as follows. Rank the N values of a given multiplier by size. Let m_r denote the value below which r percent of the values lie. The measure of dispersion is $(m_{.8413} - m_{.1587})/2$. For a normal distribution this is one standard error.

The experiment done after each new data set and new set of coefficient estimates can be any experiment. For the results in the stumulus paper three experiments were done using 100 trials each. The same random numbers were generated for each experiment, which avoids noise in comparing across experiments. For these results, there were 8 solution failures for each experiment. When a failure occurred, a new draw was taken, so the number of good trials was 100 (not 92). Ignoring solution failures is likely to bias downward the estimated standard errors, although there is no obvious way to estimate by how much.

10.2 Bootstrapping the MCF Model

On the website you can download the MCF model for use on your own computer. Included with this material are commands for bootstrapping the MCF model. Click "Download for own PC use—Fair-Parke" under **The MCF Model (Solve)** for instructions.

Bibliography

[1] Fair, Ray C., 2004, *Estimating How the Macroeconomy Works*, Cambridge MA: Harvard University Press.

[2] Fair, Ray C., 2005, "Policy Effects in the Post Boom U.S. Economy," *Topics in Macroeconomics*, Vol. 5, Iss. 1, Article 19.

[3] Fair, Ray C., 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.

[4] Fair, Ray C., 2007b, "Evaluating Inflation Targeting Using a Macroeconometric Model," *economics - The Open-Access, Open-Assessment E-Journal*.

[5] Fair, Ray C., 2009, "Has Macro Progressed?" *Journal of Macroeconomics*, forthcoming.

[6] Fair, Ray C., 2010a, "Possible Macroeconomic Consequences of Large Future Federal Government Deficit," February. Forthcoming in NBER, *Tax Policy and the Economy*, Vol. 25.

[7] Fair, Ray C., 2010b, "Estimated Macroeconomic Effects of a Chinese Yuan Appreciation," *Business Economics*, October 2010, 233–243.

[8] Fair, Ray C., 2010c, "Estimated Macroeconomic Effects of the U.S. Stimulus Bill," *Contemporary Economic Policy*, October 2010, 439–452.