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MODLER for DOS or Windows
Statistical Information and Modeling System

SimSet User Guide

Onscreen Solution File Editor Program

LIMITED WARRANTY

Trademarks Acknowledged

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Introduction

This document describes the SimSet Solution File Editor program, which runs in a DOS window either as a standalone program or side-by-side to MODLER and permits you to edit a model's solution file interactively onscreen. In many respects, this program has been superceded by a version that is a fully integrated component of MODLER for Windows, beginning with MODLER version 11.1, Build 1. Nevertheless, it is still being provided, both for users who are already familiar with it, and for use with particularly large models, in which case it may provide faster execution than does the windows version.

Before you begin reading the present SimSet user guide, you should already have worked with MODLER. Ideally, you should have worked through the first six chapters of the *MODLER User Guide*, which among other things will have acquainted you with the essential characteristics of that program, including issues associated with the creation and updating of MODLER Data Banks, as well as models and solution files. In order to understand fully the information in this guide, you will need to understand how to document data series, as well as how to update data banks and create solution files. This SimSet guide presumes a reasonably high level of familiarity with MODLER and its conventions, and focuses quite specifically upon issues directly associated with the use of SimSet as a companion program to MODLER. You might also wish to look at the MODLER-related document *Building and Using a Small Macroeconometric Model: Klein Model I as an Example*, which can be found at www.modler.com and provides a step-by-step worked example using a well-known and easily replicated small macroeconometric model as a learning guide. Another relevant reference at www.modler.com is *Building and Using Post-Keynesian Economic Models. The Godley-Lavoie Models as Examples*, which provides further examples of the way in which SimSet can be used.

Chapter I

SimSet Solution File Editor

General Characteristics

Introduction

SimSet is a MODLER side-by-side facility, which operates in a DOS Window and permits solution files to be edited onscreen, using a spreadsheet-like tabular format. The version described here can be used either with the DOS version of MODLER or the Windows version, specifically versions 6.51 and later. This guide describes its use in a Windows context.

The purpose of this first chapter is not to provide you with comprehensive details, but instead to highlight certain aspects of the SimSet program, in order to make you aware of a number of its characteristics that might not be noticed otherwise, once you begin to consider the program's operational details. From the beginning it is important to realize that the use of SimSet involves certain fundamental ground rules. First, in all cases, it *requires* the existence of a model and at least one solution file. Second, any model used *must already be compiled* and the solution file must exist compatibly with this model; of course the model and solution file must each have been created originally using MODLER. Third, operationally, most actions performed using SimSet affect the solution file *immediately*; there are only a few noted exceptions to this rule. SimSet is a solution file editor by design and therefore displays the current contents of a solution file at each point in time of its use.

The program's interface is a menu-based screen. Specific variables, both exogenous and endogenous, can be selected for display, appearing as horizontal rows of numbers. The cursor keys are live, thus allowing each number to be addressed directly, at which point new values may be inserted, replacing the previous ones. The endogenous variables are each shown immediately above two other rows of numbers, which are the corresponding adjustment values: Add factors and Multiplicative factors. If these associated values have not been set, they will uniformly appear as the values 0.0 and 1.0 respectively since addition by 0.0 and multiplication by 1.0 are identity operations. The exogenous variables are each shown immediately above corresponding values that are either percent changes or differences; percent change is the default option, but this can be changed using the F2 function key. Exogenous variable values can be changed either directly or by changing the associated percent or difference values.

A further characteristic of SimSet is that each solution file variable can also be viewed graphically as a time plot. Moreover, in this mode, any changes made to its values will be immediately reflected in the appearance of the graph. "Variable," in this context, is widely defined: any observations displayed in the SimSet editing table can also be displayed graphically and changed, including not only endogenous and exogenous variables but also their associated Add factors, multiplicative factors, or percent changes or differences. Each of the variables, in this wider sense, can be operated on individually, with all changes reflected visually. Because this graphical facility operates on each of the solution file elements in isolation, it permits their values to be considered both individually and as time series.

Because this document is a learning guide and the graphics display aspect of SimSet constitutes a feature likely to be most appreciated by experienced users, this aspect of the program is not stressed at first. However, as is explained in much more detail in Chapter IV, this graphical display is invoked from the tabular editing display by pressing the TAB key while the cursor points to a particular variable observation row. The screen will clear instantly to reveal a line graph on the left and, on the right, the numeric values of the variable, arranged as a vertical column. On opposite sides of this column will be the associated dates and percent change (or difference), also in columns. These columns can be scrolled up or down using the screen control keys: the cursor keys, plus the PgUp and PgDn and Home and End keys. If at any point the letter I key is pressed (for insert), the individual values will then be highlighted, under the control of the cursor keys. The highlighted values can be changed using the number keys (and also those for +, - and the decimal point). Any changes made will be automatically reflected in the graph on the left of the screen. Changes made to either the original variable values or the associated percent change or difference will result in conforming changes in the values in both columns. At any point, pressing the TAB key both stores the modified values (if any changes have been made) and returns the display immediately to its multiple variable, tabular representation. The principle benefit of this facility is that it permits the easy visualization of the time path of variables, such as exogenous variables or target endogenous variables, making it much easier to provide assumed values for such variables in the process of making initial forecasts or establishing alternative scenarios.

Setting Up for Operation

There are certain differences in the way that the SimSet program initially executes, depending upon whether it is opened from within MODLER as a side-by-side facility or is operated standalone. Essentially, when executed from within MODLER, certain of the preliminary parts of the SimSet initialization process are omitted. However, for general information, it will be helpful during the more specific program description in the next chapter to begin from the very beginning, so that you will see exactly what the difference is when SimSet is executed standalone versus as a side-by-side MODLER program. The difference essentially reflects the amount of information that must be provided by the user at the time SimSet begins to operate.

In all cases, the SimSet executable (SimSet.EXE) should be located in the same directory as the MODLER executable, the DOS version of which is called MODLER.EXE and the Windows version MODWIN.EXE. When SimSet is operated as a standalone program, it will ordinarily be useful for you to have first created a Windows "Shortcut" that is located on your Windows Desktop or in some other accessible folder. If you create such a Shortcut and then *right* click on it with your mouse, you will see a display similar to that shown in Figure 1 below. A possible difference initially might be that by default your display will have the "General" pane selected automatically, whereas in the figure here "Program" has been selected.
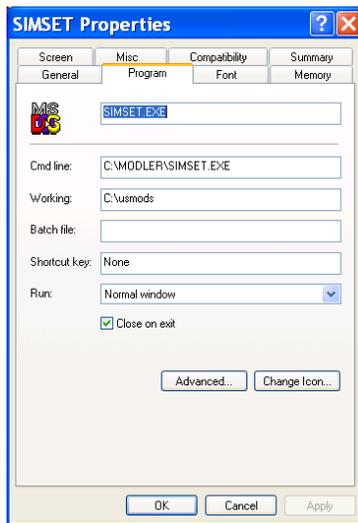
Figure 1.   SimSet Shortcut Properties

Notice, in particular, that if you select "Program," the command line ("Cmd line") will specify the path location of the SimSet executable. The working directory ("Working") specifies the directory initially used during program execution. The directory referred to when specifying the location of the command line *must* be the one in which SimSet.EXE is to be found. Similarly, the Working directory (or folder) should be the same as that containing the model and solution files you wish to use; otherwise, you may have trouble locating these files. As shown in Figure 1, SimSet.EXE is located in the MODLER directory, and the model and solution files are presumed to be in the C:\USMODS directory. An alternative way of organizing the program, which permits another model and solution directory to be used, is described in Chapter IV.

SimSet: General Operational Characteristics

As mentioned earlier, exactly what you will see initially as a display when you execute SimSet will depend upon how you cause it to be executed. In particular, there is a difference between the content of opening screen when SimSet is operated in

standalone mode versus when it is executed by MODLER as a side-by-side operation. However, before considering such practical matters, it is important to understand that, as a general issue—standing behind the program's operation—the most fundamental conceptual distinction that will be made is between *Endogenous* and *Exogenous* variables. In the present context, this distinction is not statistical, but simply a matter of whether or not a given variable's values will be generated by the operation of the model. A variable the values of which are forecasted, solved for, or otherwise produced by the operation of the model is said to be *Endogenous*. Alternatively, a variable the values of which are generated externally to the model being considered, perhaps by assumption, is an *Exogenous* variable. Fundamentally, seen as a computational problem, a model to be solved is simply a set of linear or (more frequently) nonlinear equations, often simultaneous to some degree. Essentially, the endogenous variables are the dependent variables and the exogenous independent, but the terminology used will be endogenous and exogenous.

The distinction just made is fundamental, inasmuch as these are mutually exclusive conditions when considering any particular variable. However, MODLER is a sophisticated program and in particular contexts it is also possible for you to *endogenize* an exogenous variable or *exogenize* an endogenous. Because of this MODLER capability, which needs to be allowed for, SimSet will generally permit you to tell it how to treat a variable, although in the absence of specific instructions from you it will default to definitions based upon its knowledge of whether, on entry, a variable is endogenous (is located among the variables defined as endogenous) or exogenous (is located among the variables defined as exogenous). It will be easiest to begin by considering these defaults to prevail and only later consider more complex cases.

To fix ideas, if SimSet is operated standalone, the opening screen will look like this:
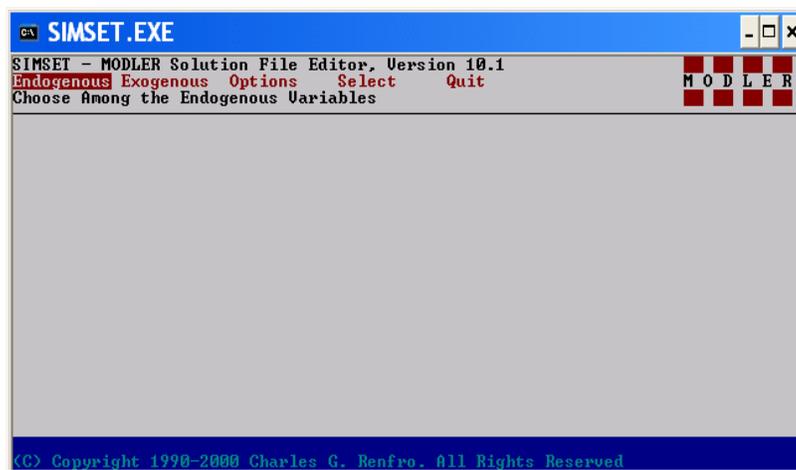

The control words are shown in red and the highlight can be moved among them. **Quit** refers to exiting from the program and **Options** and **Select** to certain specific operations that can be ignored initially. The first step is to indicate the type of variable you wish to

consider, **Endogenous** or **Exogenous**. When you choose the variable type and once you have selected the model and solution file to use, you will be presented, in a window, with a scrollable listing of the model endogenous or exogenous variables. To the right of the window will be information about the keys to press to select a particular set of variables, to confirm the selection, or to backtrack.

The choice of **Options**, in contrast, permits you to specify the **Path**, hence the location of the model and solution file. It also allows you to set the **Style** reference to dates or number of periods—as in the interval 1995 to 2000 versus the number of observation periods that this interval contains. In addition, another option, described later, is the data **Entry** mode. Clearly, if you choose **Quit** you will be indicating that you wish to quit the program.

The variables themselves, since they may be many in number, will almost always be listed by name in a scrollable window:
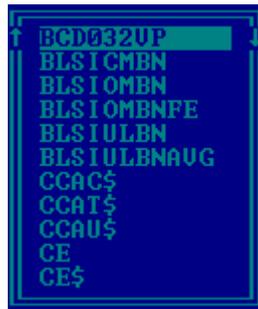
In many cases, such a window may appear superimposed on a larger window. Focusing first on the *default* variable listing window, this listing will be alphabetical in orientation and will thus begin with the lexicographically "first" endogenous or exogenous variable—remember that listings of these two types of variables will generally be separate. Even when split into specific variable subsets, these listings will also ordinarily be alphabetical.

When viewing a default listing, you will generally have several choices. You can immediately press the Enter key, to display the data initially for all the variables in the list. Then, when the display appears, you can always subsequently move from variable to variable, by pressing the screen control keys (keyboard cursor keys, PgDn, PgUp, etc). Alternatively, *before pressing the Enter key*, if you type the first letter of any variable name, you will find that the listing window changes so that the first variable shown in the listing is the alphabetically first variable, possibly with that letter as its initial letter. You can then use the up/down cursor keys to select the particular set of endogenous or exogenous variables to be displayed initially. Subsequently, once the observations on particular variables have been displayed, you can use the appropriate hot key (in this case the * key) to redisplay the list of variables, perhaps in the process having selected particular variables. You will find it much slower—at least if your model is at all

large—simply to scroll back and forth through the variables as they are displayed with their observations. Nevertheless, if you wish, once any variables have been displayed, you can display any other of that type (endogenous or exogenous) by simply scrolling up or down using the screen cursor control keys.

However, yet other alternatives will generally be available. Prior to pressing Enter, and thus before any observations have been displayed, you will also usually have the choice of more broadly selecting the data to appear.   Commonly, there are at least two other options: First, you may specify a particular group of variables, not necessarily alphabetically ordered, which you must have previously listed in a separate *Groupfile* (having an extent .GRP). This is the "Defined Group Option;" the groupfile format and conventions are exactly the same as those for a MODLER groupfile.   Second, if you are displaying endogenous variables, you may display only those variables for which there exist, currently, nonzero add factors.   Alternatively, if you are displaying endogenous variables, you may display only those variables for which there exist, currently, nonunitary multiplicative factors.   Each of these groups will vary in size, depending upon the number of add and multiplicative factors you use, if any.   In other contexts, other variable characteristics can be used as selector criteria.

The "Defined Group Option" itself provides considerable flexibility. First, you can specify as many variables in a group as there are variables in the model.   Second, SimSet at present makes no distinction as to whether the variables in the group are endogenous or exogenous.   Once you have pressed **Endogenous**, SimSet will display all the variables in a group *as if they were endogenous*.   Similarly, once you have specified **Exogenous**, you will be able to treat all the variables in a group *as if they were exogenous*.   Thus, for example, variables that you wish to treat as excluded endogenous can be formed into a group and treated as exogenous.   However, the simple fact that you have treated the variables a particular way in the context of SimSet is not sufficient to change their status in the solution of a model; you will separately need to tell MODLER how these variables should be treated.   The SimSet distinctions established are only a matter of flexibility in the editing of a solution file. However notice that, although listing the variables in solution order is not at present an automatic SimSet option, as you become more adept in your use of SimSet you can accomplish even this, if you wish, by using the "Defined Group" option.

Main Tabular Display

In whatever way you choose the variables to display, once you have pressed the Enter key at the appropriate point, SimSet will display a group of variables.   As noted earlier, aspects of this screen display (plus other operations) can be controlled using "Hot Keys;" these can be listed by pressing the F1 key, which will cause a small window to be opened in the middle of the screen.   Press any key to remove the window and restore the original display.

The main tabular display that you see on the screen will vary slightly depending upon whether you are viewing endogenous or exogenous variables, and examples of each are shown below.   If the variables are endogenous, as in the first example, the display will show the values of each variable, followed immediately by its associated constant and multiplicative adjustment values, all in rows with dates across the top.

Using the PgUp, PgDn, and the four arrow cursor keys, the display can be panned left or right, or scrolled up or down, in order to display progressively all observations on any variable and all endogenous variables and associated adjustments. Conventionally, a zero value for an additive (constant) adjustment or a value of 1.0 for a multiplicative adjustment implies the effective (or actual) absence of an adjustment, since as noted earlier zero added to or 1.0 multiplied by a value leaves the value unchanged.

The exogenous variable value display, in contrast, shows the level values of the exogenous variables and in the row immediately below the percentage change or differences that are associated with these level values. Percent change is the default.

Notice that the observations are provided in *pairs* of rows, in contrast to the endogenous case, which displays *triplets* of rows.

Chapter II

Working with

Endogenous Variables

Introduction

In the previous chapter it was explained how to set up a Shortcut on your desktop that not only executes SimSet but also establishes its working directory, which will be assumed to be the one containing the relevant model and solution files. Alternatively, MODLER can establish the same operating conditions, but generally only if you make sure that the MODLER (ModWin.EXE) and SimSet executables (SimSet.EXE) are located in the same directory. Other ways of proceeding are possible, but these involve greater complexity that you may not wish to deal with if you are a new user of either MODLER or SimSet or both. You will also recall that there are certain differences in the initial SimSet screen, depending upon whether it is executed side-by-side from within MODLER or as a standalone program. The essential distinction is the defaults that may have been established at the point at which you first see SimSet's opening screen.

Assuming that you are starting from your "desktop" and that a Shortcut icon for SimSet appears there, if you doubleclick on this icon, you should next see the screen shown in Figure 2. This is the same screen shown initially in Chapter I.
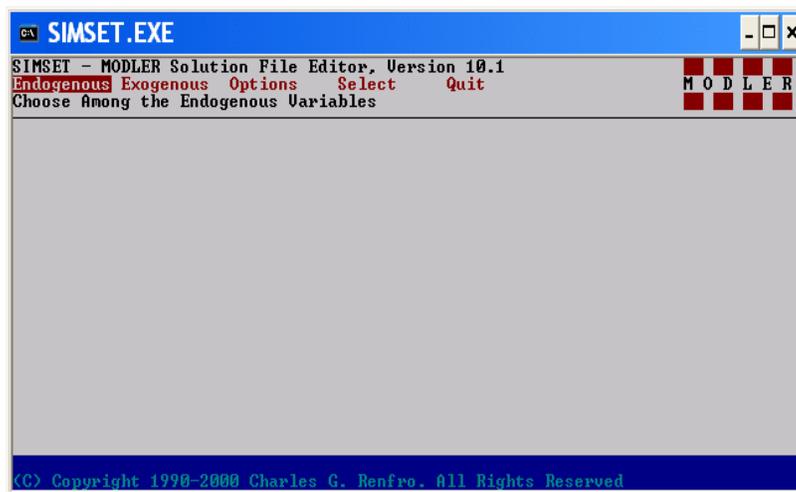

Figure 2.   SimSet Opening Screen

The simplest way to proceed is to press the Enter key immediately, since the word **Endogenous** is presently highlighted. The effect will be to display the screen shown in Figure 3, with the word **Model** highlighted. Notice that the third line in each display provides a short instruction. In Figure 2, this is "Choose Among the Endogenous Variables" and in Figure 3 "Select Model."   In all cases, this third line provides operating hints to remind you about your current choice.
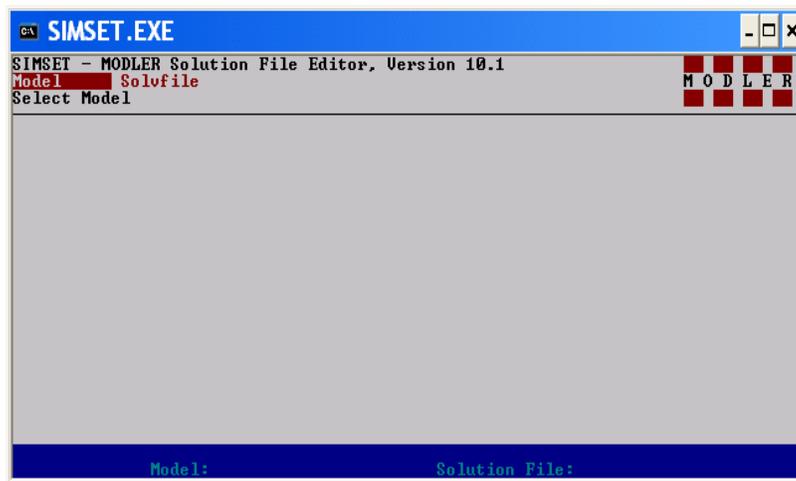

Figure 3.   Model and Solvfile Selection Screen

Had we wished, at the point of first viewing Figure 2, instead of selecting **Endogenous** we could have moved the cursor one to the right to highlight **Exogenous**, then have selected that. Often, you may wish to make this alternative choice—which is considered in Chapter III, but in either case, once having selected, you will see the screen shown in Figure 3. In effect, both paths next lead to this figure. There is a good reason: before observations on any variables can be displayed, it is first necessary to specify the model and the solution file (Solvfile) that will be used.   Hence there is a need, in either case, to take care of this detail first, before proceeding further.   Alternatively, it would also have been possible to move the cursor over to **Select** and then to press the Enter key: this too will display the screen shown in Figure 3, but this option is much more relevant once you have initially selected a model, if you should wish to change from one model to another; it also does not automatically lead to a subsequent screen.

From the screen shown in Figure 3, press the Enter key twice. You should then immediately see a screen similar to that shown in Figure 4, on the next page. Actually, the first time you press the Enter key, you will be provided a place to type in the name of a model to use, but this choice of course depends on your knowing in advance which models are available to use, which you may not.   Pressing Enter the second time causes the models located in the chosen directory to be listed, as shown in Figure 4 (Remember the "Working" shortcut setting: this selects the directory). In this example, we only have one model, so that there is really no choice to make.   Therefore, press the Enter key again, to choose it.
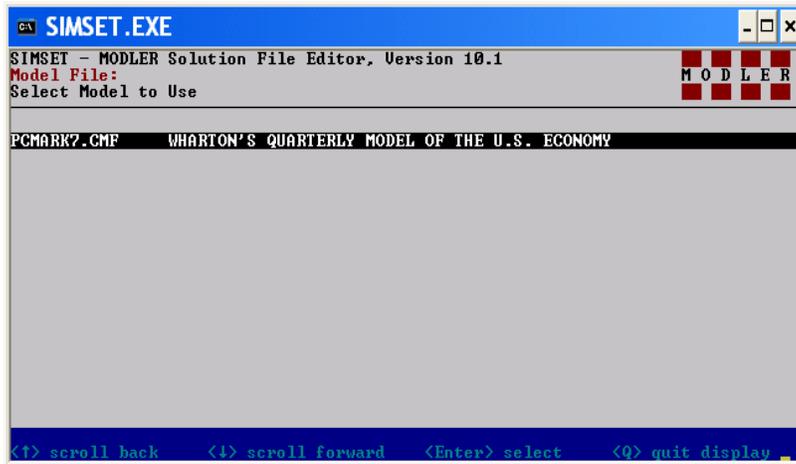
Figure 4.   Model Choice Screen

Obviously, if there are two or more models, then you will need to use the cursor keys to select the particular model that you wish to use. Having selected the model, then press the Enter key, which will display the screen shown in Figure 5. Notice once again that, in the case of each screen, the third line provides a short, informative instruction, to let you know what the program expects for you to do next.
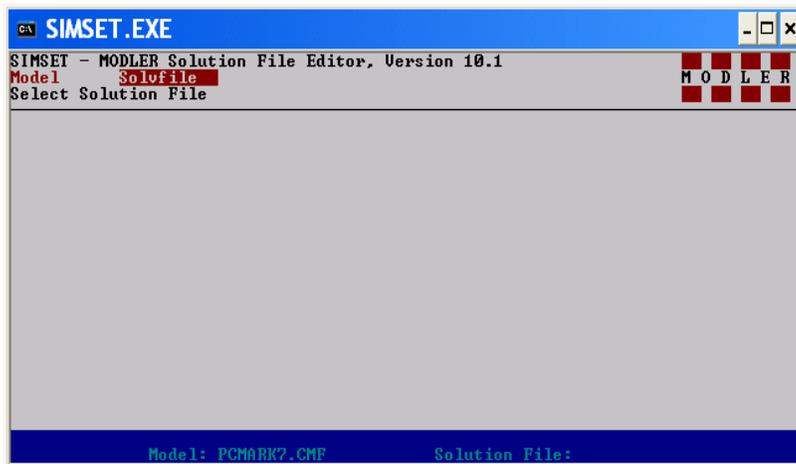
Figure 5.   Solvfile Selection Screen

At this point, it should not be surprising to find that two things in particular have occurred, as illustrated by Figure 5.   First, we are presented again with the screen originally displayed in Figure 3, except that the cursor has moved one to the right to highlight **Solvfile**, rather than **Model**.   Second, notice that the status bar now contains the name of the model that we just selected.   There is a blank space after the status bar entry "Solution File," inasmuch as we have yet to select that.

Starting from Figure 5, pressing the Enter key twice reveals the screen shown in Figure 6.   As before, the first press of the Enter key provides a place to enter the name of the solution file.   The second press causes the existing solution files to be listed.   Only the solution files contained in the C:\USMODS directory will be listed (remember "Working").   In the present example, our only choice is the single "MySim.Sol" solution file.   Notice the extent .Sol on the solution file and .CMF on the model file: we are using the *compiled* model, which is why .CMF appears, rather than .MOD.

Figure 6. Solvfile Choice Screen

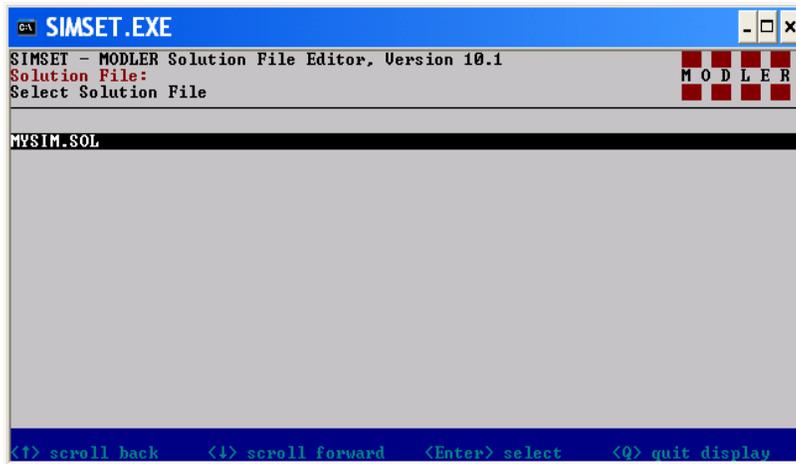If at this point you press the Enter key, you should then see the screen shown in Figure 7.
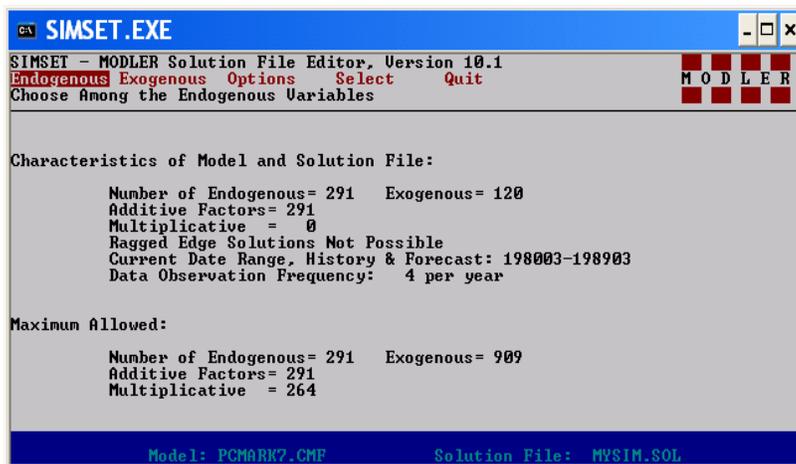

Figure 7. Endogenous Variables Initial Display

.   This screen provides you with information about the model and the currently selected solution file. It is clear from this screen that the model has 291 endogenous variables and 120 exogenous.   There are 291 Add factors currently set, but 0

16

multiplicative adjustments.   In addition, it is not possible to use this solution file to make a ragged edge solution.   The current date range, which includes both historical observations and observations (on the exogenous variables at least) for the possible forecast period, extends from 198003 to 198903.   The data observation frequency is 4 per year. All this information is generated by the model and solution files in combination and is simply displayed by SimSet.   Notice also that the status bar identifies by name both the model and the particular solution file being used.

Judging by the stated forecast period, this is obviously not an up-to-date model. This model is, in fact, one of the earliest ever to be created using the microcomputer version of MODLER, although it can still be used with the current version, which is significant,. It is the first large-scale model to be solved using a microcomputer. As it happens, the reason that there are 291 Add factors is that when this model was solved for the first time with this particular data set, in September 1984, the forecast was adjusted to conform with a forecast previously made with a larger model (of about 650 equations) that was located on an IBM mainframe.   It took literally minutes in those days to solve even the smaller model for 12 quarters, rather than a few seconds (as now), so that the size of the model used mattered, but it was desirable for the base forecasts to match for both the large and small versions.

Notice also that, so far, we have now viewed *six* screens since the initial screen. Although numbered 7, Figure 7 is the *sixth* SimSet screen, from the opening screen, that we have viewed in order to get to this point.   The significance of this remark is that Figure 7 displays the *first* screen that you will see if you execute SimSet from within MODLER, using the menu option of that program shown in Figure 8 or 9.   The distinction is that Figure 8 displays the screen you are likely to see if you are using a MODLER for Windows version prior to version 11.1, Build 1.
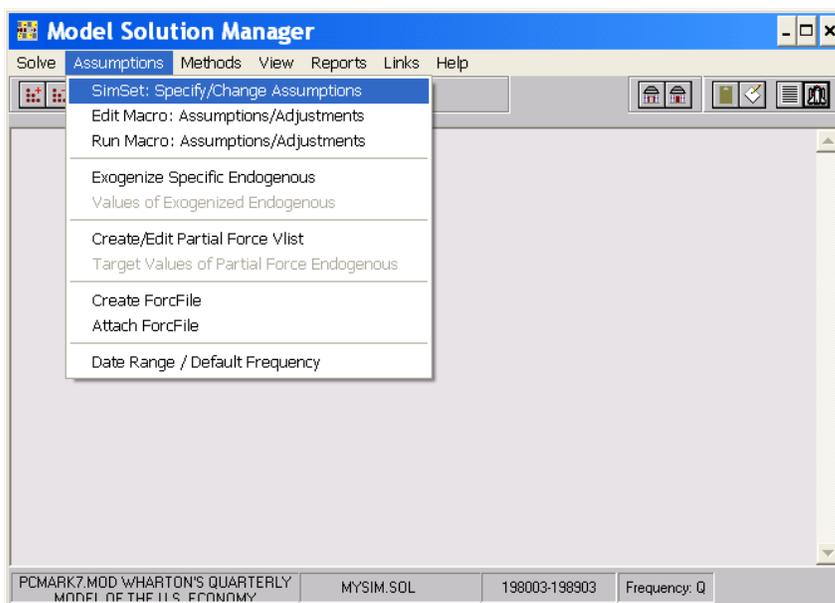

Figure 8.   Execution of SimSet from Within MODLER for Windows

Figure 8A displays the screen you are likely to see if you are using MODLER for Windows versions starting with 11.1. The menu element highlighted, if selected, will cause the SimSet program to be executed from within a DOS window.
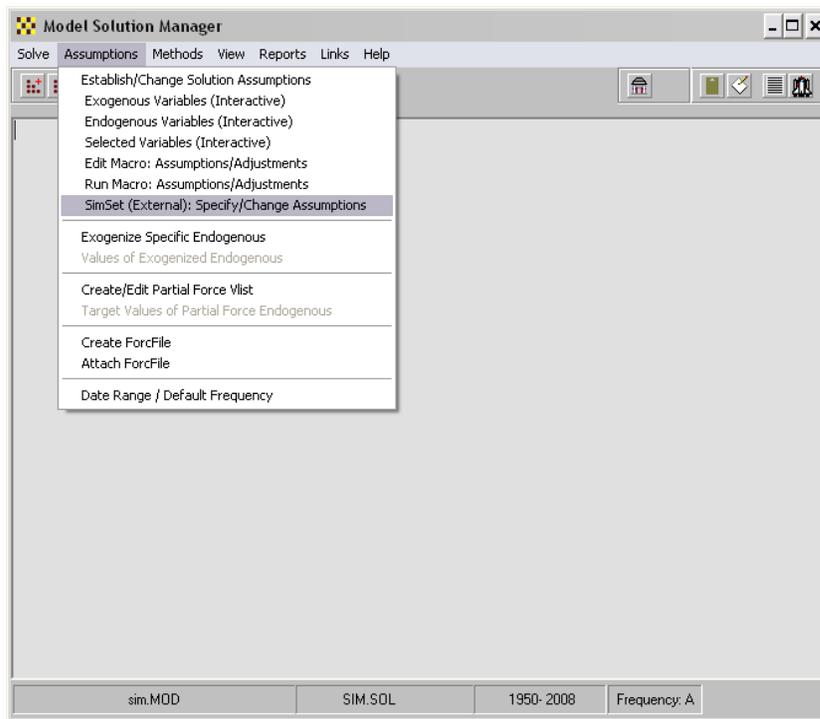

Figure 9.   Execution from within MODLER for Windows Versions 11.1 and later

Notice that, in either case, in order to execute SimSet from within MODLER, you will need to go to the *Model Solution Manager* screen of that program and then select both the model and solution file to use. At this point, as illustrated here by Figure 8, if you click on the **Assumptions** menu item and then choose SimSet: Specify/Change Assumptions, you will cause SimSet to execute and see the screen shown above as Figure 7. If you were to select the same model and solution file, the display will be identical. The difference is that when executed from within MODLER, the selection of both the model and the solution file is done using the relevant MODLER facilities, instead of those provided by SimSet. MODLER will automatically pass to SimSet information about the model and solution file to use, rather than requiring you to provide this information again. From this point on, the only use-difference in these two operating modes next occurs when you finally quit SimSet. If you are running it standalone, control will be returned to the desktop. If you are running it as a MODLER side-by-side program, control will be returned to MODLER.

One word of warning, however: if you operate SimSet standalone, when MODLER is running, you must make sure not to attempt to open either the same model or the same solution file simultaneously in both programs. Generally, the Windows operating system will prevent you from performing such simultaneous execution. However, the fundamental point is that this type of parallel operation could result in the corruption of

18

your solution file, since neither program will "know" what the other program is doing. You would then have two different programs writing to the same solution file.

A further word of warning is the reminder that all editing of the solution values that takes place within SimSet *immediately* affects the values stored in the solution file, with a few noted exceptions. SimSet is a solution file editor: it permits you to see what is in the solution file *now*. Since it displays what is *currently* in the solution file, when changes are made and then displayed, what is implied is that the solution file has been changed in that respect. For the most part, there is no intermediation between what you are doing and the effect; consequently, you are well advised to back up solution files *before* you begin to edit them using SimSet.

At this point, as can be seen from Figure 7 above, we have selected a model and a solution file. We have also chosen to work with the model's *endogenous* variable values. The question now is, of these, which? Particularly in the case of a large model, it may not be convenient to deal constantly with literally hundreds of variables. Fortunately, SimSet provides several ways to subdivide this set.

Begin by pressing the Enter key. In response, SimSet should display the screen shown in Figure 10. Looking at this figure, you will see a scrollable list of variables in the center of the screen, on the left. With a little bit of experimentation, you will see that if you press the up or down cursor keys you can scroll this list. In addition, if you type a particular letter on the keyboard, the list will change (except in the case of the letters A and B), displaying the variables in alphabetical order beginning with the letter you type. Type a different letter, get a different list—actually a subset of the list. You can, at any point in this process, confirm your then current choice by pressing the Enter key.
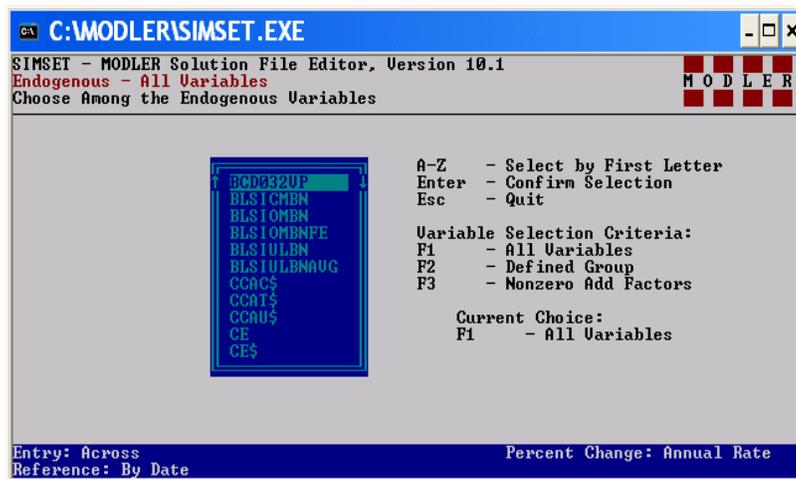

Figure 10. Exogenous Variable Selection Screen

Alternatively, if you decide that it has all been a big mistake, by pressing the Esc key on your keyboard, you can leave this screen, returning to that previously displayed in Figure 7. Generally, in SimSet, the Esc key allows you to go back one step each time it is pressed. Notice the reference, on the screen in Figure 10, to the Esc key.

However, in addition, as also indicated by this screen, you can use any of the first three Function Keys on your keyboard, in order to make a variable selection.   F1 selects *all* the Endogenous variables, F2 selects a *named group*, and F3 selects those endogenous variables that currently have a *Nonzero Add factor* associated with them; in the present case, this choice actually consists of all the endogenous variables, but more usually only a subset of the endogenous variables is likely to be selected.

The group selection ("Defined Group"), instigated by the F2 key, is made with reference to one or more "Group Files." As mentioned before, these are MODLER-related text files containing the names of variable values.   MODLER for Windows incorporates facilities to define and manage variable groupings, although it is also possible simply to use a text processor program to define these variable groups. Whatever groupings of a model's endogenous variables you wish to make in the form of a group file can be used here.   The purpose of such a file—in addition to allowing you to control the number of variables in any group—is to permit you to make a selection among variables that is not limited by alphabetical order.   The elements in different group files can also be the same across groups or mutually exclusive by group.   How you define a group is entirely up to you, although it is generally most useful for present purposes if you distinguish between endogenous and exogenous variables when forming these, for reasons that will shortly become clear.

Should you choose to use defined groups as variable selection criteria, when you press the F2 button, you should see a screen similar to that shown in Figure 11. This choice presupposes the prior existence of group files, located in the same directory as the model you are using.   If such files exist, then they will be listed and you will be able to choose among them.
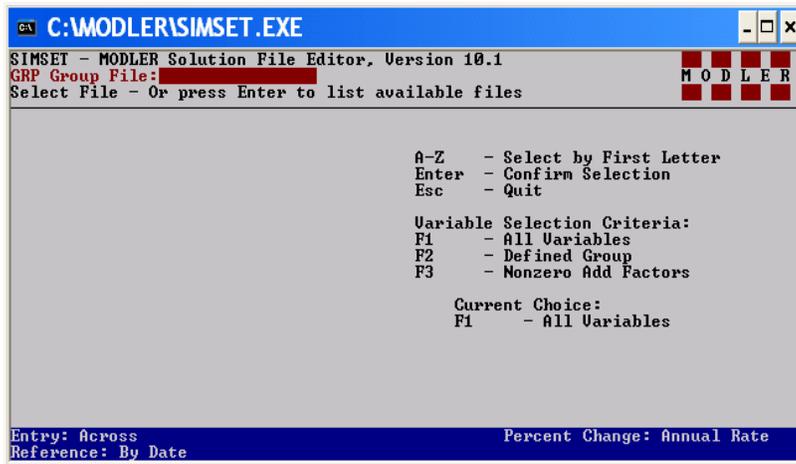

Figure 11.   Group Selector Screen

When you have made your choice, you should next see a screen similar to that shown in Figure 12.   This screen will have the same general appearance irrespective of the criteria used to make the choice of variables.   There is nothing on the screen to designate the specific group choice that has been made.

20

Figure 12. Endogenous Variables Editor Screen

This screen, the Endogenous Variables Editor Screen, obviously identifies the model and solution file used. At the top of the screen, there is an indication of the type of variables, "Endogenous," and the specific selection criteria imposed. In addition, for each variable, the variable observation values are shown, just to the right of the variable name. On the next line, the ADD factor value for that variable is shown and on the third line the MULT factory value. Obviously, when the ADD factor value is zero, there is no Add factor for the particular observation; similarly, a MULT factor value of 1.000 is neutral in its effect. You will also discover that if you use the cursor keys you are able to move up or down or to the right or left and cause the set of variable values to scroll or pan in response. You can, in addition, enter values, in effect overwriting the values originally there; as will be explained, the exact effect will depend on the Mode setting, just above the variable names. The "Mode" designation of "One Value" indicates that any editing that is done is performed one value at a time; as will be explained, this convention can be changed in a variety of useful ways.

Notice also the status bar. The "Entry: Across" designation on the left side of the status bar indicates that when values are entered and the Enter key is pressed, the cursor automatically moves to the right. It is alternatively possible to set the Entry criterion as "Down," so that values are entered down a column. Furthermore, it is possible to set the down entry mode so that the cursor skips to the equivalent row of the next variable, in order to enter progressively variable values, ADD factors, or MULT factors. Details about this SKIP option are provided in Chapter IV.

In addition, if you press the F1 key, which is described on the status bar as controlling access to the "List of Hot Keys," you will see this particular list of keys superimposed on the screen, as shown in Figure 13. Of course, these keys operate whenever the Edit Solution File screen is open; this list simply identifies how they operate, in case you cannot remember what each of them do when you need to use them.

21

Figure 13. Hot Key Identification

At any time, press the * key and you will again see the list of variables we have seen before. Scrolling down this list of variable names will cause the variable values to scroll; you can also jump from one part of this variable list to another by typing a letter of the alphabet, as before. In particular, when working with this list of variables, if you press the Enter key you will observe that the variable values now displayed on the screen will be changed, with the first variable in the table now the same as that at the top of the list when you pressed the Enter key. Consequently, the * key-Enter key combination thus permits you to move around in the displayed set of variable values quite generally, rather than simply by scrolling up and down.

Next consider the F2 key. This key opens a small sub-screen that refers to the way in which the percentage change calculations are made, either one period at a time, or compared to one year ago, or at annual rate; the default is annual rate, as shown in Figure 13. Obviously, the usefulness of these alternative percentage change conventions will to a degree depend upon the observation frequency of the data; in any case, they are more relevant when dealing with exogenous variable values, as will be discussed in Chapter III.

The F3 key permits you to move the cursor and highlight particular values. This key has a rather simple function, but this can be a useful facility in those instances in which you wish to make comparison between separated values.

The F4 key permits you to copy the values displayed to any of several different types of textfiles. You can choose to copy only the values of the variables, only the ADD factors or only the MULT factors.

The F5 key permits you to refresh solution file values using observations that are extracted from another solution file or a MODLER data bank. You can refresh either variable values or Adjustment values. Clearly, it is always possible, separately from SimSet, to copy a solution file and give it a new name, using the Windows or DOS copy

22

facilities.   However, what F5 key specifically permits is the replacement of selective sets of values within a given solution file, using values obtained externally. SimSet offers the only way to do this and this option is explained in detail in Chapter IV.

The Tab key, in contrast, provides the capability to switch between the tabular variable editing screen and a graphical plot of a particular variable.   It works as follows: at the time the Tab key is pressed, *for whichever row the cursor is then on*, the values of that row are immediately displayed graphically, as illustrated by Figure 14.   It is then possible to insert values in this time series of observations so that the graph immediately displays the effect of that insertion. If and when the Tab key is pressed subsequently, these values (including any changed values) are immediately transferred back to the relevant row of the editor table (and to the currently accessed solution file). In contrast, the Esc key can be used, instead of the Tab key, in order to return to the tabular display without making any permanent changes. This graphical display is particularly useful in order to establish a set of values that vary in a particular way over time, inasmuch as the time path of the variable is easy to see.   Note also that the values affected are specifically those associated with the *row* the cursor is on when the Tab key is originally pressed. Consequently, this graphical editing facility can be used not only with solution file variables, but also ADD factors and MULT factors.

Bear in mind, when considering the potential use of this graphical facility, that MODLER permits models to be solved using particular endogenous variables as target variables (subject to certain requirements).   Therefore, there are cases in which it is desirable to be able to specify the future values of both endogenous and exogenous model variables, establishing an expansion path for the model forecasts.   One use of the SimSet graphical display facility is to establish such sets of values for model variables.   Another is instances in which there might be intervening missing observations: sometimes it is useful to be able to interpolate these by eye, rather than to attempt to define a mechanistic interpolating formula.   More specific details about the graphics facility is provided in Chapter IV.
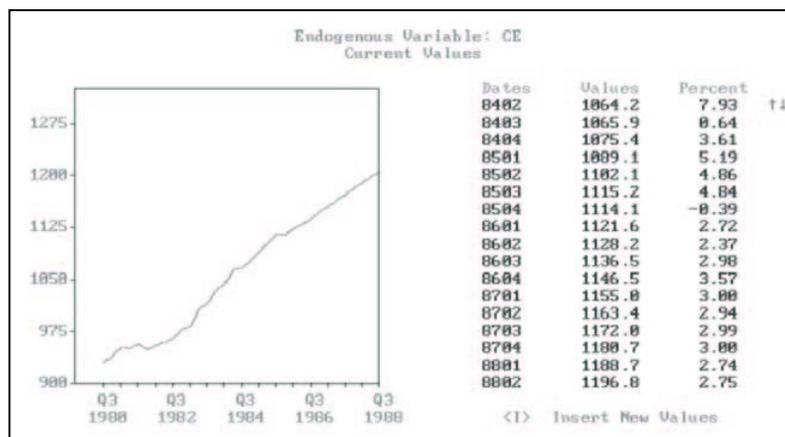

Figure 14.   Graphical Display of A Variable

23

Finally, the / hot key permits you to set the entry mode. The mode default, as indicated earlier, is One Value, meaning by this that each change in each value is entered separately. However, there are a number of cases in which it is attractive to be able to enter a value that then persists. For example, one might wish to set a rate of growth that persists for the next ten periods. Alternatively, one might wish to set a growth trend over several periods. The characteristics of each of the choices offered in Figure 15 are described in the display in Figure 16 found on the next page.

Figure 15. Mode Control Facility

Several of these operating modes require some getting used to, so that it is usually a good idea to try several examples first, using a backed up solution file, in order to make sure that you understand exactly what the effects of each are. Notice also that these options work both in conjunction with the Dates or Period style options, depending upon whether you want to do something for a period set of dates or for k time periods forward.

The purpose of the present SimSet manual is to describe possibilities. Notice that you can, as described, change the values of the endogenous variables, both historically and during the forecast period. However, as a rule, except when a specific endogenous variable is going to be exogenized or used as a target value in a global or specific FORCE solution (or, in the case of actual values, in a Ragged Edge Solution), there is little point in directly changing the forecast period values of these variables, for they will normally be overwritten during the model solution process. Ordinarily, with the exception of the three cases mentioned, it will be changes made to additive or multiplicative adjustments that will actually affect a solution. However, SimSet is designed to provide you more or less complete flexibility to choose what to do, rather than enforcing any particular course of action.

ONE VALUE indicates that you wish to key in values one at a time.

REPEAT indicates that any value keyed in at the cursor is to be repeated k times in the following k periods. Depending upon whether the time-reference style has previously been set to DATE (the default) or PERIOD, you will be asked to specify the date or number of the period, k; if you specify the date, SimSet internally computes k.

ADD, **SUBTRACT**, **MULTIPLY**, and **DIVIDE**, respectively allow you to add to, subtract from, multiply, or divide the given variable value by another value. Procedurally, once one of these options is chosen, you first type in the value of the solution value (or simply press enter to confirm the existing value), then you will be asked to specify the value to be added (subtracted, multiplied by, or divided by) and then, once you have pressed Enter, the date or period until which the modification is to be repeated.

The **GROW** and **TREND** options are, roughly speaking, the converse of each other. GROW allows you to specify the percentage by which a given value should increase over a given number of periods (or until a given date). TREND allows you to specify the value in a future period (or later date), with the intervening values computed as lying along a linear trend. The growth rate under GROW will be interpreted as an annualized or period rate depending upon the PERCENT setting, which can be set or changed using the F2 key (the default is annual rate).

IDTREND (Increment-Decrement **TREND**) allows you to specify an additive trend for a set of values (endogenous, additive adjustment, or multiplicative adjustment). You will be asked to specify the contemporaneous additive value, the value in the future, and the date or period to which that second value refers. The implicit growth rate will be computed (including 0, implying simply the addition of some constant value).

Figure 16.   Entry Mode Options

Chapter III

Working With

Exogenous Variables

An obviously important use of SimSet is to set and change values of a model's exogenous variables. The facilities described in the last chapter are generally available both for endogenous and exogenous model variables, so that this chapter should be viewed as a particular elaboration on the previous chapter, with the focus placed upon the differences between endogenous and exogenous variables.

If you compare the screen shown just below in Figure 17 with that shown in Figure 7, you will see that the only difference is that **Exogenous** is highlighted, rather than **Endogenous**.
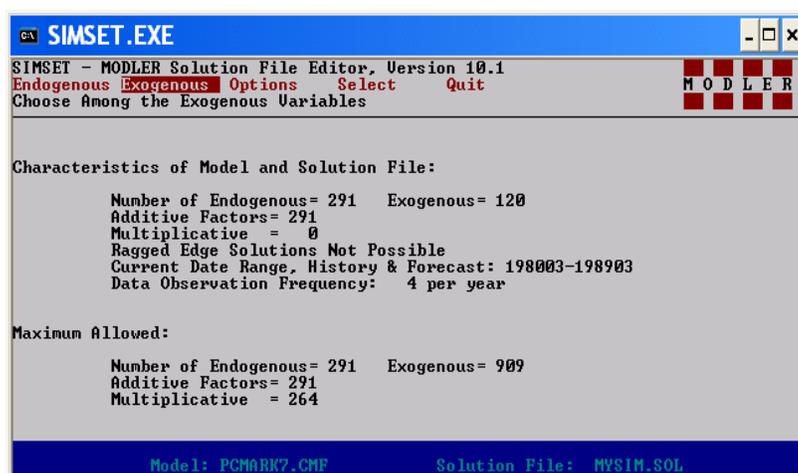

Figure 17. Exogenous Variable Initial Screen

Press the Enter key and you will see the screen shown in Figure 18. If you compare this screen with that shown in Figure 10, you will see immediately that the only real difference in appearance is the lack of any reference to the F3 function key and "Nonzero Add Factors" inasmuch as exogenous variables are not "add factored." However, you may wish to group them for display, using MODLER group files, or to begin looking at values having selected an initial alphabetic letter for a group. These facilities are exactly the same whether you are working with endogenous or exogenous variables.
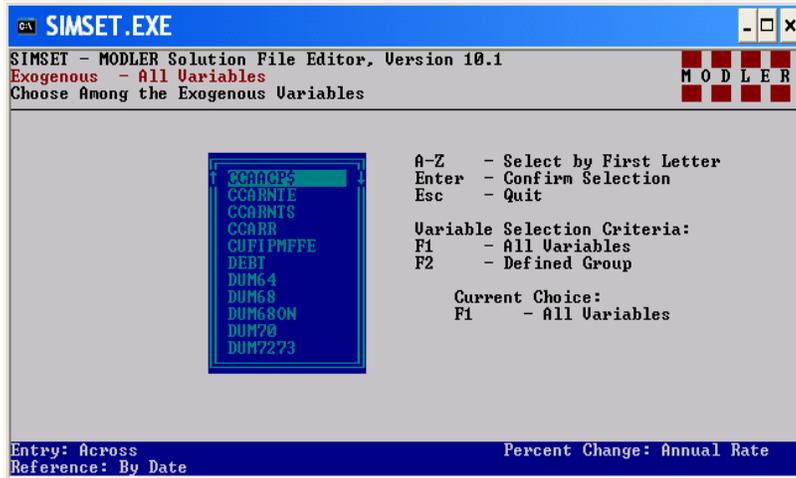
Figure 18.   Exogenous Variable Selection Screen

There are several significant differences between the editing screen for exogenous variable values, shown in Figure 19, and that for endogenous variable values, shown in Figure 12.   What is immediately noticeable is that in Figure 19 each variable is represented by a pairs of rows, with the first line displaying level values and the second line the percentage change between dated observations (separated into columns). Thus, for example, for 198803, for CCAACP$, the percentage change value of 11.192 is the annualized percentage change from the second to the third quarters of 1988.   The display also shows the values for 198802 and 198803, and this specific choice is made because these are the last two solution file observations on each of the exogenous variables.

Figure 19.   Exogenous Variable Editor Screen

The effect of adding values for any variable beginning in 198804 will be to enlarge the solution file by one record for each observation progressively, since a MODLER solution file is always organized so that the observations for a given time period on each variable are stored in a particular record. Adding new (forward) observations, at the limit of the solution file values, therefore always involves adding one or more new records to

the solution file.   In contrast, new variable observations cannot be added before the first observation for which the solution file is defined.   To add observations earlier than the first historical time period requires the creation of a new solution file that is defined for these one or more prior historical time periods.

Consider in contrast to Figure 19 the screen shown as Figure 20.   The only difference is that the Home key has been pressed, when looking at the display in Figure 19. Similarly, if you press the End key while looking at the display illustrated in Figure 20, you will see again the display in Figure 19.   Obviously, Figure 20 shows the first few observations on each variable beginning in 198003, the third quarter of 1980.   The percentage change shown in the first column is, of necessity, "NA," not available, inasmuch as there are no earlier observations to use in order to compute these values.

Figure 20. Exogenous Variable Editor Screen

You should also be particularly aware of the fact that the values shown are matched pairs, in the sense that the level values for each variable and the percentage changes are inextricably matched.   One of the consequences is that *numeric* changes made in either of the paired lines for a variable will be reflected immediately in the other. It does not matter whether you change the percentage change values or the level values; the other line will be immediately affected. Of course, in certain cases, specific things will happen. For example, if you set a level value of a variable to 0.0, the effect will be the cause the percentage change between it and the next chronological value to "NA."   On the other hand, you *cannot* set the percentage change to "NA" and thereby cause the previous chronological level value of the variable to be set equal to 0.0, the reason being that "NA," as a percentage change value, does not uniquely determine level values. Furthermore, it is not a *numeric* change.

Another difference between the way in which SimSet functions when working with exogenous variables, as opposed to endogenous, is the effect of pressing the F2 function key. You will recall that, in the case of endogenous variables, pressing this key allowed you to change the characteristics of the percentage change calculations.   In contrast,

when you are working with exogenous variable values, pressing this key also allows you to choose between expressing the period-to-period changes as differences versus percentage changes. Not only can you express the changes as differences but you also have a choice between *One Period* (that is, the previous period) and a year ago. Among other considerations, sometimes it is useful to deal with absolute period-to-period differences and sometimes percentage changes.

However, in general, as is partially illustrated by Figure 21, the hot keys and the facilities they refer to are functionally much the same whether one is working with endogenous or exogenous variables.

Figure 21. Exogenous Variable Hot Keys

More generally, except for the fact that it is useful to treat endogenous and exogenous variables separately, in order to minimize any confusion, there is relatively little difference operationally in the way that SimSet functions in each of these cases. There are, in fact, only two basic differences between the exogenous variable display and the endogenous variable display. These are:

- the lack of additive and multiplicative adjustments for exogenous variables, and

- the display of percentages or differences in the case of the exogenous variables.

Otherwise, the two types of display are functionally quite similar.

Single Variable Graphical Display

As indicated earlier, and described briefly in the previous chapter, the graphical display is invoked from the main tabular display by pressing the TAB key while the cursor is on a particular variable.   The screen will clear instantly to reveal a display

containing a line graph on the left and on the right the values of the variable, arranged as a vertical column of approximately 22 values; less if there are less values per variable in the solution file.   On each side of these vertical values will be the associated dates and percent changes (or differences); exactly how these percent changes (or differences) are computed will depend on the setting of the main display, which is indicated at the bottom right corner of that display and others, such as that in Figure 21.

In contrast to the tabular editing display, which shows the variables in context, the graphical display effectively isolates a particular variable, showing it both numerically and visually, with the option to change the individual values. The graph shows all the values of the variable, both history and future (if any), with the single proviso that the display is limited to approximately 275 values, always the latest chronologically. Similarly, the variable values shown in the column tabular display on the right of the graphical screen are also the chronologically latest observations. However, these columns can be scrolled up or down, as appropriate, using the screen control keys, so that all the values can be displayed progressively, even the very earliest chronologically.
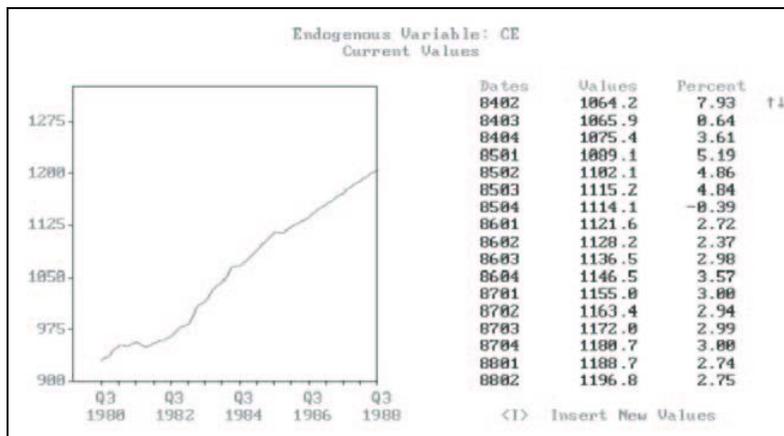
If no other action is taken, the graphical display simply provides this alternative "view" of a single series.   However, if instead the letter I on the keyboard is pressed (I for insert), two things occur.   First, an individual value, found in the column of numeric values to the right of the graph, will be highlighted—specifically the value at the top of the list. Using the up/down cursor keys (as well as PgUp and PgDn), this highlight can then be moved progressively from value to value, up or down; as appropriate, the entire list will in addition scroll up or down to display additional values not shown originally. Similarly, using the right and left arrow cursor keys, the highlight can alternatively be moved from a variable's values to the values of the implied percentage change (or differences). Thus it is possible to highlight any value of the series or its corresponding percentage change or difference.

The second effect of pressing the I key is to make the highlighted value subject to change: just by typing using the number keys (and possibly those for +, -, and the decimal point), any of these highlighted values can be changed directly.   These changes

will affect both the values of the series and the associated percentage change (or difference): to insure consistency, all changes made to either the original variable values or the associated percent change or difference will result in changes in the relevant values in both columns. Furthermore, any changes will be automatically reflected in the graph on the left of the screen.   At any point, pressing the TAB key both stores the new values (if any changes have been made) and returns the display immediately to its multiple variable tabular representation.

There is also an escape option, which will leave the solution file unchanged upon return to the main tabular display. If instead of pressing the TAB key, you press the Esc key, you will be returned to the main tabular display.   The values entered in graphical mode will remain in the vector of values of the variable, as you can verify, but they will *not* have been written to the solution file.   You then have at least two choices: you can immediately press Esc again, which will clear the changes that you made in graphical mode.   Alternatively, immediately, or later, you can press Enter, which will have the effect of putting into the solution file all current variable values, among those variables displayed on the screen.   If before this you have not pressed Esc, the effect will be to put new values into the solution file.   Note also that if you return to graphical mode, with the same variable selected, make other changes and then press the TAB key, the effect will be to enter all the new values into the solution file. Generally, the best practice is to escape completely (press Esc twice) if you want to undo changes in graphics mode; otherwise, you run the risk of inadvertently putting changed values into the solution file. Conversely, if you want to put new values into the solution file, you should use the TAB key as the means of returning to the main tabular menu.

In some cases, the values shown in the graphical display can look strange.   For example, if the variable isolated using the graphical display is an Add factor, its percent changes can vary from 0.0 to NA (when the change period to period is 0.0 to some non-zero value) to ******* the latter indicating that the percent change is too great to show on the display.   Similarly, if the variable isolated is the percent change associated with some exogenous variable, its percent change as computed will in fact be the percent of a percent, which will result in potentially strange values.

Further information about the graphics display and other particular facilities common to the endogenous and exogenous variables displays can be found in the next chapter, Chapter IV.

Chapter IV

Supplementary

Operations

This chapter describes a variety of special operations that are generally relevant. The discussion here is intended to supplement the descriptions of program operation in the earlier chapters of this document.

Opening Screen

The SimSet opening screen is shown in Figure 22. In order to make selections, you can either use the left-right cursor keys to move the selector highlight left or right, then press the Enter key in order to confirm that selection. Subsequently, the Esc key allows you to return to previous menu levels, either after or before you make a change. Alternatively, you can use your keyboard to type the initial letter of the choices: (E)xogenous, (O)ptions, (S)elect, and (Q)uit. With the exception of the first, the effect of making each of these selections is described in the following sections of this chapter.
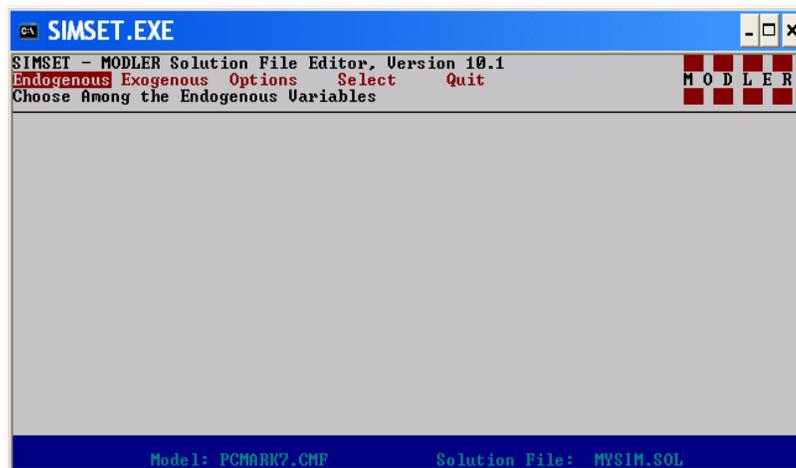

Figure 22. Opening Screen

As discussed in previous chapter, the choice of **Endogenous** or **Exogenous** indicates that you respectively wish to view and edit endogenous or exogenous variables. However, as you know from this earlier discussion, these keys will not allow you to display any values until the model and solution file have been selected.

The Quit Selection

If you choose to Quit, by selecting **Quit**, you will see the screen shown in Figure 23. There are only two choices: **Yes** or **No**.   If you choose **No**, the quit operation is cancelled and you will be returned to the opening screen.   If you choose **Yes**, the program will terminate.
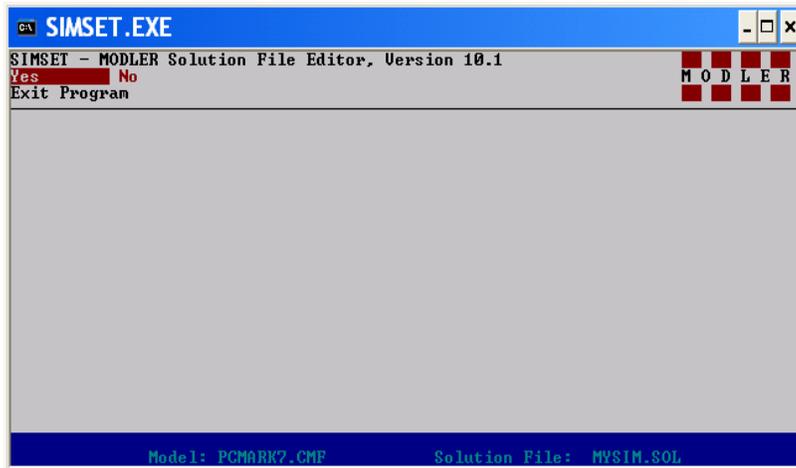

Figure 23.   Quit Choices

The Options Selection

The effect of making the **Options** selection is shown in Figure 24. Clearly, you are then permitted to select the **Path**, **Entry** mode, and time reference **Style**, as will be described.
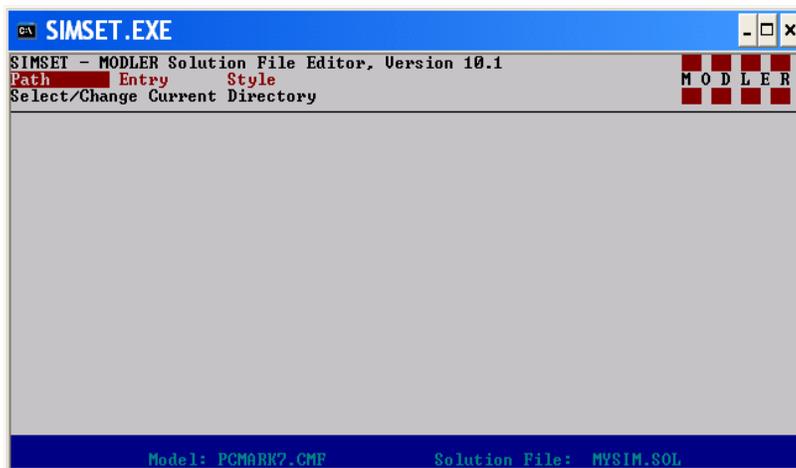

Figure 24.   The Options Selection

Choosing **Path** allows you to specify the drive and directory containing the model and solution files; both model and solution files must be in the same directory. The only option here is to type in the drive letter, followed by the directory selection, separated by forward slashes, as normal. Once you have made this selection, SimSet will expect to find the model and solution files there; as a consequence, the directory is expected to exist and no provision is made to create a new directory.
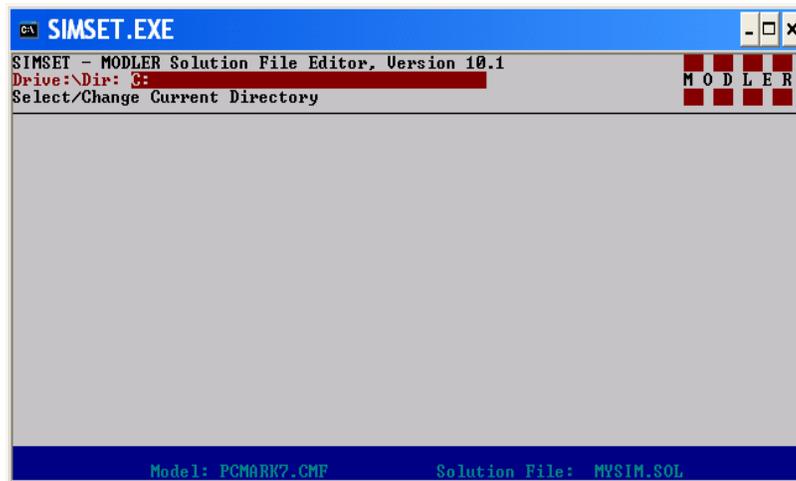

Figure 25.   Path Selection Screen

Entry in turn offers three options: ACROSS, SKIP, or DOWN. These choices are progressively viewed by pressing the tab key to toggle. ACROSS (the default) means that data values are entered left to right, DOWN means that data values are entered top to bottom, and SKIP means that the cursor will skip down at regular intervals; these effects are described in the previous chapters, since they vary with the situation.

Figure 26.   Entry Style Selection Screen

The **Style** option allows you to choose to refer to observations by DATE (the default) or by PERIOD; the choice between them is made using the tab key as a toggle key.
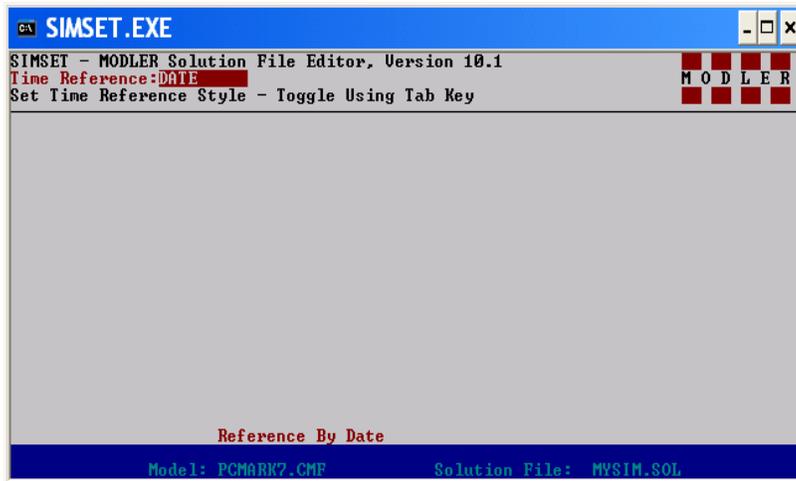

Figure 27.   The Time Reference Style Selection Screen

The Select Selection

As indicated earlier, the **Select** command allows you to select between **Model** and **Solvfile**.   This screen is also displayed as a sub-screen of other screens.
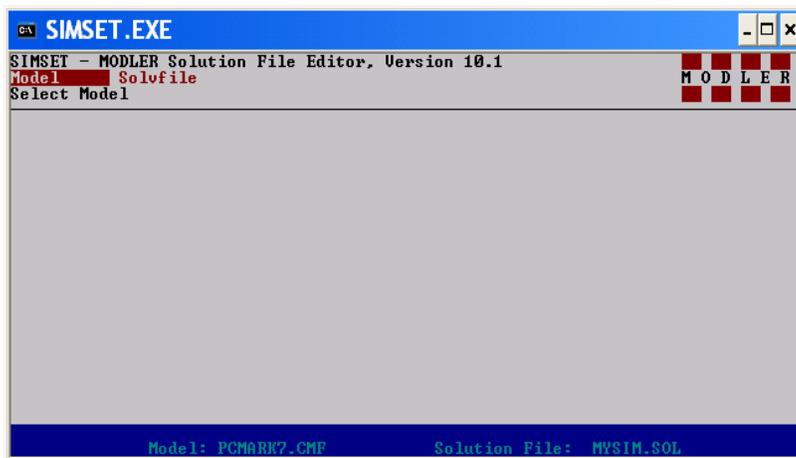

Figure 28.   Select Command Choices

When you make your choice between **Model** and **Solvfile**, you will then be asked either to type in the name of the relevant file or to press the Enter key to view all the available model or solution files in the current directory; a highlight bar can be moved up

or down with the up/down cursor keys, in order to make the selection. Note, however, that if you execute SimSet from within MODLER and if you have selected your model and solvfile before executing the SimSet command, these selections will be preserved; you will not have to make the selection in SimSet. The possible exception to this rule is if you are working on a Local Area Network (LAN): in some instances you may not be allowed to enter SimSet with model and/or solution file already selected unless these files are designated as shared files. If these are not so designated, you may need to detach the model and Solvfile (using the Detach command) before executing SimSet.

Other Screens

Main Tabular Display and the SKIP Option

The SKIP option was briefly discussed earlier, in the context of the **Options** menu. This feature is intended to allow the keyboard entry of multiple values for a particular class of variables. For example, it can be used to type in values for a number of add factors or the exogenous variables.

If the SKIP option is in force, the cursor will skip from one row to the next comparable row. For example, if it is in force and the cursor is placed on a particular row value for an endogenous variable and the Enter key pressed (either before or after values are typed in) the effect will be to cause the cursor to skip to the next Endogenous variable below, skipping over the two rows containing Add and multiplicative factors respectively. Similarly, if the cursor key rests on an Add factor row, and if the Enter key is pressed, the effect will be to cause the cursor to skip over both the multiplicative factor on the next row and the next endogenous variable value; the cursor will stop at the next Add factor value it comes to. In the same way, if the SKIP option is in force and the cursor rests on an exogenous variable row, when the Enter key is pressed the cursor will skip to the next endogenous variable, ignoring the percent change variable in the next row.

Single Variable Graphical Display

As indicated in earlier chapters, the graphical display is invoked from the main tabular display of the editing screen by pressing the TAB key while the cursor is on a particular variable row. The screen will clear instantly to reveal a display containing a line graph on the left and on the right the values of the variable, arranged as a scrollable vertical column of approximately 22 values; less if there are less observations per variable in the solution file. On each side of these vertical values will be the associated dates and percent changes (or differences); exactly how these percent changes (or differences) are computed will depend on the setting of the main display, which is indicated at the bottom right corner of that display. An example is shown as Figure 29.

In contrast to the tabular display which shows variables in context and comparatively the graphical display effectively isolates a particular variable, showing it both numerically and visually, with the option to change the individual values. The graph shows all the values of the variable, both history and future (if any), with the single proviso that the display is limited to approximately 275 values, always the chronologically latest. Similarly, the variable values shown in the column tabular display on the right of the screen are also the chronologically latest observations. However, as appropriate, these columns can be scrolled up or down using the screen control keys, so that all the values can be displayed progressively, even the very earliest chronologically.

If no other action is taken, the graphical display simply provides this alternative "view" of a single series. However, if the key of the letter I is pressed (I for insert), two things occur. First, an individual value will be highlighted, specifically the value at the top of the list. Using the up and down arrow cursor keys (as well as PgUp and PgDn), the highlight can be progressively moved from value to value, up or down; as appropriate, the entire list will scroll up or down to display additional values not shown at the time. Similarly, using the right and left arrow cursor keys, the highlight can be moved from a variable's values to the values of the implied percentage change (or differences). Thus it is possible to highlight any value of the series or its corresponding percentage change or difference.
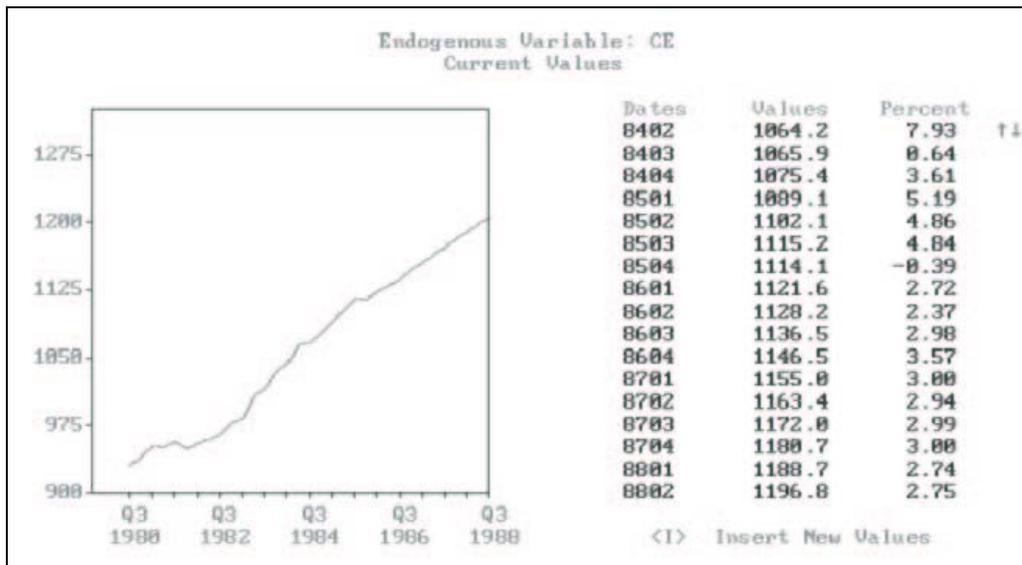

Figure 29. Series Graphical Display

The second effect of pressing the I key is to make the highlighted value subject to change: just by typing using the number keys, plus those for +, -, and the decimal point—any of these highlighted values can be changed directly. These changes will affect both the values of the series and the percent change (or difference): to insure consistency, all changes made to either the original variable values or the associated percent change or difference will result in changes in values in both columns.

Furthermore, any changes will be automatically reflected in the graph on the left of the screen.   At any point, pressing the TAB key both stores the new values (if any changes have been made) and returns the display immediately to its multiple variable tabular representation.

There is also an escape option, which will leave the solution file unchanged upon return to the main tabular display. If instead of the TAB key, the Esc key is pressed, control will be returned to the main tabular display. The values entered in graphical mode will remain in the vector of values of the variable, as you can verify, but they will *not* have been written to the solution file.   You then have at least two choices: you can immediately press Esc again, which will clear the changes made in graphical mode. Alternatively, immediately, or later, you can press Enter, which will have the effect of putting into the solution file all current variable values, among those variables displayed on the screen.   If, before this time, you have not pressed Esc, the effect will be to put new values into the solution file.   Note also that if you return to graphical mode, with the same variable selected, make other changes and then press the TAB key, the effect will be to enter all the new values into the solution file. Generally, the best practice is to escape completely (press Esc twice) if you want to undo changes graphics mode; otherwise, you run the risk of inadvertently loading changed values into the solution file. Conversely, if you know that you want to put new values into the solution file, you should use the TAB key as the means of returning to the main tabular menu.

In some cases, the values shown in the graphical display can look strange. For example, if the variable isolated using the graphical display is an Add factor, its percent changes can commonly vary from 0.0 to NA (when the change period to period is 0.0 to some non-zero value) to ******* the latter indicating that the percent change is too great to show on the display. Similarly, if the variable isolated is the percent change associated with some exogenous variable, its percent change as computed will in fact be the percent of a percent, which will result in potentially strange values.

Directory Control Facility

In general, the current directory will be the directory from which you execute SimSet.   However, you can instead point to any directory on any accessible drive, using SimSet's directory control facility.

When SimSet is executed, it looks first on the current directory for a file called:

SimSet.DIR

If found, SimSet attempts to read this file, using the information it contains to automatically point to a "default" directory.   This file should contain one line in the following format: driveletter:directory   For example:

C:\MYSOLV

where C: designates the drive and MYSOLV a particular directory. This line should be followed by a carriage return and line feed (the equivalent of the Enter key). Of course, once SimSet is in execution this choice can be overridden using the PATH choice, found in the **Option** submenu.

Solution File Refresh Option

It is useful from time to time to be able to reload a solution file selectively, in comparison with re-making it from scratch. For example, you might wish to re-use earlier values of ADD factors or you might wish to reset previous values of exogenous variables. Alternatively, you may want to make a new solution file, but use ADD factor values from an earlier solution file. The refresh option is designed to permit these and other similar operations, allowing you to load solution file data in bulk, by type of solution file variable.

The Refresh option, which is listed among the "Hot Keys," is invoked from the tabular edit screen. As just indicated, this facility permits the solution file to be refreshed using data from either another (comparable) solution file or a MODLER data bank. The types of solution file data that can be refreshed include values of Endogenous or Exogenous variables, and either (or both) Additive or Multiplicative Adjustments (ADD or MULT factors). The variable selection choices include all variables of each type, a single selected variable, or any defined group, defined using a standard MODLER GRP file.

When the Refresh option is invoked, initially a pair of superimposed screen windows will appear, as illustrated in Figure 30. The center window will contain the words "COPY Endogenous Variables" or "COPY Exogenous Variables," depending upon the type of variable being operated on during that editing session. If the first of these appears, the second smaller window will offer two choices, Endogenous or Adjustments, as shown.
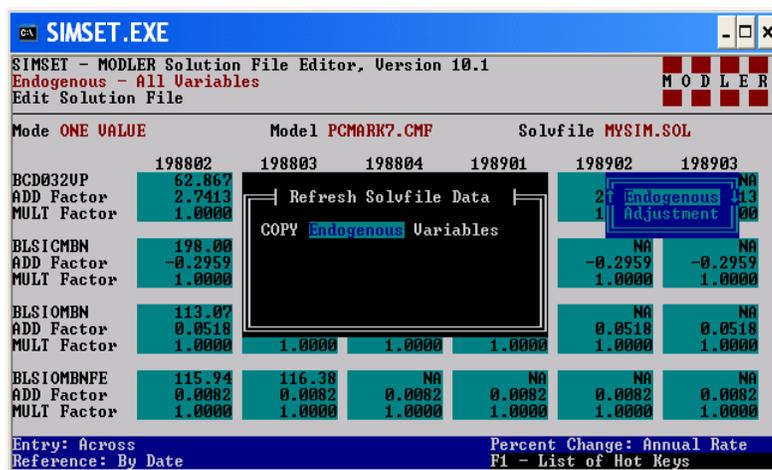

Figure 30. Refresh Variable Choice

If you press either Enter or the E key (for Endogenous), you will then be offered the choice between another solution file or a data bank as the external data source, as shown in Figure 31.
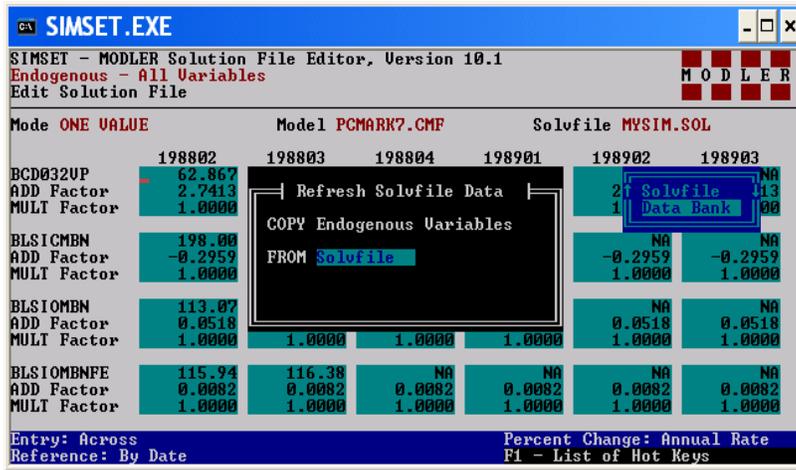

Figure 31.   Data Source Selection

Whichever of these you choose, you will then be asked to provide the name of the file, with the option of displaying the entire list of such files contained in the relevant directory, from which you can select. The selection you make will then be shown in the display, as illustrated in Figure 32. You will at this time also be asked whether you wish to refresh (that is, overwrite) all the variables, one variable, or a group.   If you choose either one variable or a group, you will then be given the chance to specifically identify the variable or variables affected, in the latter case by specifying a particular group file.
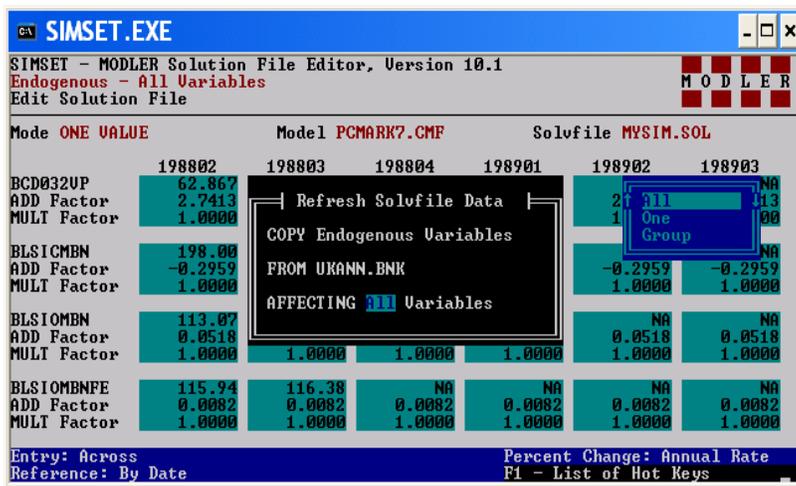

Figure 32.   Variables Affected

Once you have made your choices you will see a screen similar to that shown in Figure 33, telling you to press Enter to execute the operation.   Even now, you are able to

cancel the operation, by pressing the Esc key, but if you press Enter you will overwrite the solution file that you are editing.
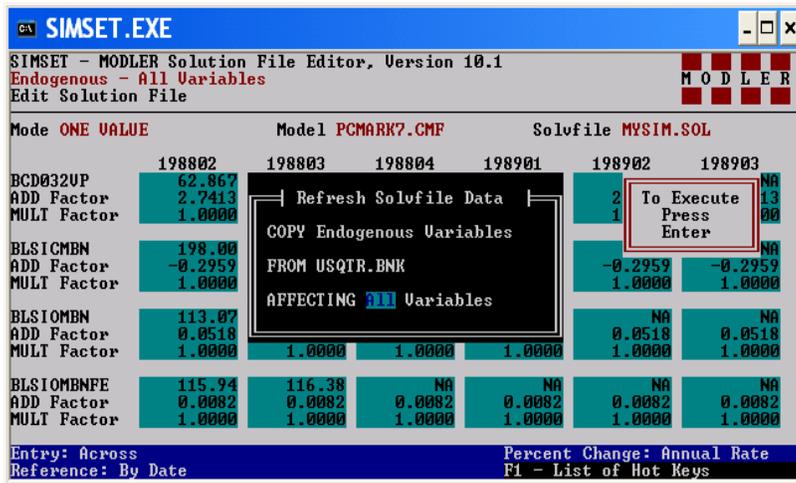

Figure 33.   Execution Screen

In this example, we have chosen to copy endogenous model variables from a particular data bank. Alternatively, starting from the screen displayed in Figure 30. if instead you were to either press the down cursor key, followed by Enter, or the A key directly (for Adjustment), the small window will clear and you will be given a choice between both types of adjustments, and either Additive or Multiplicative adjustments. Once having made this choice, your choice will be registered in the larger center window. Your remaining choices will then be the same as illustrated by the successive Figures.

From this example, the process of setting up to refresh the solution file should be fairly obvious, although you will need to practice a bit with a live example to feel comfortable with the operation.   When making the choice of a refreshing data source between another solution file or data bank, you will also need to be aware of a few pertinent restrictions.   First, the external solution file must be comparable; that is, it *must* be a solution file originally created for use with the *same* model as the one currently attached.   MODLER does permit solution file variables to be copied selectively from one model's solution file to another model's solution file, in order to allow models to be operated as satellites, but this facility is *not* a SimSet facility—for details about the satellite model facility, see the MODLER *System Reference Manual*, chapter 9.   Unlike MODLER, SimSet is restricted to copying from one comparable solution file to another.

The second major restriction is that if a data bank is used as the data source, only a single bank can be used.   Multiple banks cannot be accessed simultaneously.   However, you can invoke the Refresh option repeatedly, using sequentially two or more data banks. Obviously, any and all data banks used must contain series observations for some or all the date range of the data contained in the solution file.

The third important restriction is that, for the defined date range (historical and forecast) of the destination solution file, all observations will be copied from the source

42

solution file or data bank.   That is, NA values will be inserted in the destination solution file whenever individual values do not exist in the source bank or solution file.   As a consequence of this mode of operation, values in the destination file are *refreshed* with values from the source file.   In contrast, the GET facility, which is a sub-option of MODLER's **Read Assumptions** and/or **Read Adjustments** facility, permits you to more selectively update solution file values.

When you choose the data source, you can provide the name of the solution file or data bank, once you have selected the data source.   Alternatively, if you press Enter, as indicated by the appropriate screen message, all the available solution files or data banks will be listed. Using the cursor-controlled selection bar, you can choose among these. Note incidentally, that you can make your choice ONLY among solution files with extent SOL. The same naming restriction does not apply to data banks; the existence of internal features in the structure of a data bank generally permits SimSet to confirm that the supposed data bank is in fact a MODLER data bank, whereas a solution file is a simpler type of file.   However, in either case, corrupted or spurious solution files and data banks can create problems for SimSet; thus, please try to make sure in advance that the solution files and data banks that you are using are valid.

As a futher caution, SimSet currently does not permit solution files or data banks it uses to be located in other directories, although you can use a drive letter prefix if you wish.   SimSet, as presently written, can address different directories, and does permit you to change from one directory to another. The limitation is upon the use of solution files and data banks from a variety of directories simultaneously.   Please advise us if this is a serious inconvenience.

Once you have chosen the category of variables to refresh and the source data bank or solution file to use, information about your selections is displayed on the screen. SimSet then offers you three choices concerning the variables to be affected by the refresh operation: ALL, ONE, or a designated GROUP.

The first of these, ALL, refers to ALL the variables currently subject to being edited; what might be called the "editing set." These will be either Endogenous (plus ADD and MULT factors) or Exogenous, but they will not necessarily be all the exogenous or all the endogenous. In fact, they may already be a "defined group": before presenting you with the "spreadsheet" editing screen, SimSet allows you to selectively choose the variables to be edited, so that ALL does not necessarily exclusively refer to ALL the exogenous or ALL the endogenous or ALL Additive or Multiplicative Adjustments.   Moreover, since you can have chosen (as discussed earlier) a defined group that includes both exogenous and endogenous, ALL may not be restrictive by type. In short, ALL simply refers to all the variables currently being (or subject to being) edited.

ONE in contrast refers to a specific single variable.   If you make this choice, SimSet will then ask you to name the variable. This name must be the name of either an existing endogenous or an existing exogenous variable. If you are refreshing a adjustment factor, or both ADD and MULT factors, SimSet will know this already; the additional

information it needs is the name of the variable of which these are ADD or MULT factors. Do not give the name as A_ or M_, for this naming choice constitutes an error. SimSet will add these prefixes itself, as necessary for data retrieval and storage.

Note also that the variable name given will be compared to all the variables in the "editing set." Thus if you are editing the Endogenous variables and you give the name of a model exogenous variable, it will not find a match—and will let you know that it has not, asking you to retype the name. Incidentally, if you are not sure whether a variable is in the "editing set," then return to the editing screen, by pressing the Esc key. Before pressing the F5 key again, you can always press the * key, which will allow you to scroll through all the variables in this set and discover any names you need. Alternatively, if you have been told that no match exits for a name you have given, simply press the Esc key, which will return you to the editing screen, where you can then press the * key and scroll through these variables.

The GROUP option similarly gives you the capability to select a more restricted group of variables within the editing set. Whenever you make the choice of GROUP, you will be asked to name the GRP file to use. Obviously, this must be an existing file, but if you do not remember the name, simply press Enter and you will be shown a list of the available GRP files; you can choose among these. By the way, in creating a group file, do *not* include variable names with prefixes A_ or M_; as noted earlier SimSet simply needs to know the names of variables, and can add these prefixes itself as necessary.

Finally, once you have made your choices, as shown above, these will be presented in the larger of the two Refresh windows. If you agree with these choices, simply press Enter; the program will then execute the Refresh operation. If not, press Esc to abort; in response, SimSet will return you immediately to the main editing display. However, in some cases, there could be a momentary delay, as it may need to reload indexes and other necessary information.

During the refresh operation, during the actual processing, SimSet will indicate the variable being refreshed, or indicate, however briefly, that it cannot find a variable. The latter event happens in particular cases: Copying exogenous or endogenous variables between comparable solution files will not result in missing variables (being comparable, they contain the same variables), but when adjustment factors are copied these may not exist in both solution files. Similarly, when refreshing from a data bank, even endogenous or exogenous variables may fail to exist. When a variable does not exist in the source file or data bank, the variable in the destination solution file is left undisturbed. Similarly, when a variable exists in the destination file, but not the source file, no attempt is made to overwrite or otherwise delete the existing variable. The exception to this rule is in the case of an Additive or Multiplicative Factor; existing ADD or MULT factors are copied to the destination file and non-existing ADD or MULT factors are neutralized in the destination file (i.e., they are given a value of zeroùif an ADD factor—or one—if a MULT factor; however, you can prevent this default operation by using a defined group

when refreshing, since if the variable does not appear in the defined group, it will be entirely unaffected by any operations performed.