

AN AUSTRIAN VERSION OF THE LUCAS CRITIQUE

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*If your idea's not defensible,
don't make it comprehensible. . . .*

Kenneth Boulding

The Austrian School of economics is mainly interested in human action. Austrian economists acknowledge that individual human beings act and that interacting economic agents form a complex system called the economy. Consequently, Austrians try to understand economic phenomena by analyzing human action. Compared to mainstream economists the methodology applied by scholars classified as Austrian usually is less formal. Indeed, the Austrian School of economics tends to criticize econometric analysis and formal modelling of the general equilibrium type. Instead of relying on formal models, Austrian economists usually start with explanatory axioms and then use thought experiments to try to understand economic problems (Rothbard 1976, pp. 19–21; Selgin 1988, pp. 20–28; Herbener 1996, pp. 97–98; and Backhouse 2000, p. 32). There is ample evidence for an aversion to mathematics and econometrics in the writings of scholars of the Austrian School of economics. The most prominent example, of course, is Mises, who argues: “There is no such thing as quantitative economics. All economic quantities we know about are data of economic history” (Mises 1996, p. 351).

Scholars of Austrian economics argue persuasively that formal models are not able to capture the complex dynamics of market processes. In the eyes of Austrian economists the market is not only an abstract place of exchange between buyers and sellers of goods, but also a process that helps to generate knowledge by letting economic agents reveal their preferences in voluntary exchanges. Profit-seeking individuals continuously will try to detect chances

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to increase profit by observing market prices of all sorts of goods and redirecting factors of production to more profitable use. Thus, without any form of central planning, production will be adjusted to the preferences of economic agents. The market process is a sequence of discovery procedures helping to deploy resources in more adequate ways. From this point of view an aversion to mathematics and econometrics is absolutely understandable; in spite of recent advances in computer technology and the theory of complexity, mainstream economists still are not (and most probably never will be) able to adequately model the inherent dynamics of the sequence of discovery procedures called the market process.¹ But, of course, Austrian economists are not alone criticizing the use of econometric techniques. The proponents of the rational expectations hypothesis, for example, do also argue that there are severe problems when policymakers try to actively manipulate economic variables based on the results of econometric analysis. This is the famous Lucas critique which will now be examined.

STRUCTURAL BREAKS AND THE LUCAS CRITIQUE

The methods of econometrics and statistics cannot be applied unconditionally to all sorts of economic problems. In order to use these statistical techniques there has to be a somewhat constant relationship between the relevant variables in the period observed. Austrian economists, of course, argue that there are no constant relationships in the field of human action. At this point it would obviously be a big mistake not to quote Mises: "In the field of human action, however, there are no such constants. The equations of mathematical economics are therefore useless for all practical purposes" (Mises 1977, p. 99).

This critique is taken extremely seriously in the field of financial econometrics. The adherents of the Variable Beta Model, for example, argue that the factor BETA (which is the coefficient used to measure risk premia in regressions based on the concept of the Capital Asset Pricing Model) is not constant over time (Krueger and Rahbar 1995, pp. 36-42). They try to model the time variation of this coefficient of a regression model. But, of course, the approach requires that there is a quite stable relationship between the coefficient BETA and the exogenous variables used to explain BETA. Thus, the problems due to the lack of constants in economics are not really solved using a Variable Beta Model.

Mainstream economists might also note that, other things being equal, economic agents will behave in a more or less stable way. This point of view is understandable and may even be accepted by quite a number of Austrian economists (Hoppe 1997, pp. 72-73). As a consequence, the problems with

¹Kirzner (1996, p. 150) and Herbener (1996, p. 157), for example, note that advances in computer technology will not help to overcome the problems of formal modelling. See also Vedder (1997, p. 77).

the variability of human action mainly become problems with structural breaks forcing economic agents to change their behavior. Mainstream economists could go on to argue that *ceteris paribus* structural breaks are not very likely to occur; of course, oil price shocks and similar exogenous factors with major influence on the behavior of economic agents are exceptional events. Additionally, econometricians can reduce the number of data points observed in order to minimize problems with known structural breaks in time series analysis. But there is a more fundamental problem because the *ceteris paribus* assumption usually will not hold. Mainstream economists regularly use econometric analysis to justify government intervention. At this point the so called Lucas critique is crucial. Lucas argues that changes in economic policy can systematically affect the behavior of economic agents:

[G]iven that the structure of an econometric model consists of optimal decision rules of economic agents, and that optimal decision rules vary systematically with changes in the structure of series relevant to the decision maker, it follows that any change in policy will systematically alter the structure of econometric models. (Lucas 1976, p. 41)

While Mises points out that there are no constant relationships in economics (so that econometric analysis can only be applied in the field of economic history) the Lucas critique goes even further. If there were constant relationships in advance of policy actions these relationships would have to break down after the introduction of new guidelines for economic policy. Profound changes in economic policy will in other words necessarily create structural breaks. Thus, careful econometric analysis of economic phenomena at a certain point of time cannot be used to investigate future effects of policy actions. Active economic policy generally is not compatible with econometric analysis and consequently econometric analysis cannot be used to justify policy actions. This problem has also been observed by a number of econometricians (Christ 1993, pp. 77-78; Granger 1999, p. 54; Boivin and Giannoni 2002, p. 105; and Granger 2003, p. 71).

The arguments put forward by Lucas have also spurred more general criticism of quantitative economics only loosely tied to the Lucas critique. Mainstream economists and econometricians have begun to concede that there is no true econometric model that can perfectly describe an economy (Christ 1993, pp. 74-75; Eichenbaum 1996, pp. 22-23; Leamer 1994, pp. 66-69; and Pagan 2002, pp. 2-3). Because of the fact that models always are at least partly wrong a number of mainstream economists even questioned whether models actually can be tested (Eichenbaum 1996, p. 22 and Leamer 1994, pp. 66-67). Leamer for example argues:

A model is a powerful device for organizing our thoughts; it is not literally true; indeed it derives its power from the very fact that it is not literally true. Thus there is no reason to test it. Instead of testing, we should be determining its accuracy and its usefulness. We should attempt to identify

empirical circumstances in which the model is useful and other circumstances in which it is misleading. (Leamer 1994, p. 66)

Thus, one surely has to conclude that the arguments presented by Lucas have been extremely influential. Lucas and his followers challenged the whole profession of quantitative economists. Econometricians simply had to accept this serious challenge and began to strike back. In fact, McCallum notes that the emergence of vector autoregression (VAR) models in the 1980s was a direct response to the Lucas critique (McCallum 1982, pp. 9-10).² It is well known that VAR models are nonstructural and try to explain variables as linear combinations of lagged values of itself and lagged values of all other variables observed. Thus, the structure of a VAR model is not based on theoretical considerations but on the dynamics of the data examined in the model. It could be argued that VAR models pose a challenge to the Lucas critique by not relying on particular structural relationships. But this challenge is a rather dubious one. Considering VAR models and the Lucas critique McCallum argues:

[T]hey consist of a set of reduced-form equations in which lagged values of the system's variables are used to explain current values, with all variables treated as endogenous. Consequently, VAR systems would seem to be even more vulnerable to the critique than the traditional models that Lucas considered. (McCallum 1982, p. 10)

Consequently, VAR models cannot help econometricians to discard the Lucas critique. This is, for example, also acknowledged by Sargent (1979, p. 8). Discussing VAR models he notes:

Further, while the techniques were developed partly in response to criticisms of standard simultaneous equation macroeconomic models, they are not intended to remedy all the defects in the standard models pointed out by critics like Lucas. (Sargent 1979, p. 14)

Additionally, Austrian economists (although being extremely critical concerning the positivist approach to philosophy favored by Popper) will most probably also agree that nonstructural econometric VAR models seem to be even more questionable than traditional econometric models because it is impossible to use econometrics to falsify theoretical concepts that already have been fitted to the historical evidence. Moreover, VAR models are not completely atheoretical because appropriate variables have to be selected in advance of estimating the model (Leamer 1985, p. 286). It seems to be obvious that the selection of adequate variables will somehow be based on economic theory. Thus, Leamer concludes: "[C]an causal inference be made in the context of vector autoregressions without relying on a priori theory? The answer is quite clearly no" (Leamer 1985, p. 256).

²Also, see Sargent (1979, p. 14).

Challenging the Lucas critique mainstream economists could also argue that most policy actions take place within a given framework. Using economic policy instruments within this given framework can be interpreted as normal policymaking. One might think that all policy actions of the normal policymaking type will not result in structural breaks. From this point of view the Lucas critique will only apply to substantial changes of policy regimes. But what does the word substantial mean in this context? Moreover most mainstream economists that try to challenge the Lucas critique favor discretionary policy regimes. Actually their opposition to the Lucas critique mainly stems from their aversion to policy regimes based on clear rules (as advocated by Lucas). But without clear rules there is no given framework for economic policy. Consequently the private sector will have enormous difficulties distinguishing between “normal policymaking” and “changes in policy regimes.” Not being able to rely on clear rules economic agents will be forced to change their behavior more frequently when policy action is observed.

There is also more fundamental criticism of the Lucas critique. The traditional Lucas critique is based on the rational expectations hypothesis. Thus, it is assumed that economic agents will use all information currently available to forecast future events. Consequently, there will be no systematic forecast errors and the private sector will predict all systematic policy actions based on economic planning. Due to rational expectations economic agents will adjust their behavior and systematic economic policy actions will consequently have no real effects. Only unforeseen random shocks originating from economic policy or exogenous events will not be anticipated. But no reasonable mainstream economist will advise government institutions to randomly select policy actions without economic planning. Some economists argue that policymakers have more information and thus may be able to forecast random exogenous shocks and then respond to these shocks. But it is of course impossible to forecast random shocks and even if government agencies had information advantages bureaucrats certainly would not be able to respond timely using the additional information. More profound criticism of the rational expectations hypothesis and the Lucas critique comes from the scholars of the Austrian School of economics.³ Hoppe, for example, argues persuasively that it would be feasible for interested observers to provide a list of all possible actions of economic agents if expectations were indeed formed according to the rational expectations hypothesis (Hoppe 1997, p. 56). Needless to say that there is no list of this kind because nobody is capable of writing down all actions economic agents possibly could think of. Additionally, the rational

³See, for example, Garrison (1986, pp. 94-95) and Hoppe (1997, pp. 56-59). But Yeager argues that there are certain similarities between Austrian economists and the proponents of the rational expectations approach. See Yeager (1987, p. 6). Similar comments also come from Garrison.

expectations theory assumes that all human beings have identical knowledge (p. 57). This assumption is also not very realistic.

One further important argument against the rational expectations hypothesis seems to be that gathering information is costly. Thus, it is not always rational for economic agents to form rational expectations. This very simple but devastating argument against the rational expectations hypothesis clearly shows a major weakness of contemporary economic theory: Economists still do not exactly know how expectations are formed. Most probably distinct economic agents use different methods to form their expectations. The forecasts of human individuals surely are influenced by their experiences and subjective beliefs. In spite of the fact that the exact way expectations are formed is a mystery it is very likely that individual economic agents somehow will adapt to changes in their environment. They will not stick to their original forecasts if significant changes take place. Thus, it seems to be certain that expectations in changing environments are not formed according to the static expectations hypothesis. Assuming that successful behavior by individual economic agents will be imitated seems to be reasonable. Thus, in the long run the economy probably will arrive at the equilibrium solution suggested by the rational expectations theory. There is, of course, an additional problem because of the fact that rational expectations models may have multiple equilibria. As a consequence investigating how expectations are formed can (but not necessarily will) help to select an appropriate equilibrium (Bullard 1991, pp. 51, 57). In any case the way to a new equilibrium surely is more painful than suggested by the elegant rational expectations approach.

At this point an important question arises: Does the Lucas critique really rely on the rational expectations hypothesis? The answer to this question quite clearly is no. As long as forecasts are not generally formed based on static expectations the Lucas critique is indeed valid because individual economic agents will react to profound changes in economic policy by altering their expectations. Disengaged from the rational expectations hypothesis this new version of the Lucas critique is even more devastating for economic policymakers and econometricians. In the long run the solutions suggested by the rational expectations approach may be correct because successful behavior of individual economic agents will be imitated by others. Thus, economic policy has to be ineffective in the long run. But the elegant rational expectations approach completely disregards painful adjustment processes. Resources will be wasted by responding to the new settings of economic policy. Without further knowledge of the way expectations are formed mainstream economists will also not be capable to construct formal models that show how a new equilibrium can be reached.

The Phillips curve discussion is an excellent example for the new form of the Lucas critique. The idea of this curve originated from econometric research that was conducted by Phillips using British wage and price data starting in 1861 (Phillips 1958, pp. 283–99). According to the data there was a trade off between unemployment and wage growth in this period. High wage

growth seemed to be related to low unemployment rates. This is hardly a surprise for most economists. But mainstream economists soon began to transform the original wage-change version of the Phillips curve presenting a price-change version relating inflation to unemployment. Based on this interpretation of the results of Phillips's econometric analysis some mainstream economists concluded that policymakers could rather freely choose between the two evils of unemployment and inflation. But of course in large parts of the period observed by Phillips money creation in Great Britain was controlled by the rules of the gold standard and so there was no active monetary policy (Glasner 1989, p. 150). Thus, following the Lucas critique econometric analysis of this period cannot help to predict the effects of active monetary policy. Economic agents in the good old times of the gold standard simply did not have to expect that inflation could rise due to a monetary expansion triggered by a central bank freed from specific rules. In the end monetary authorities produced stagflation by unsuccessfully trying to manipulate the unemployment rate in accordance to the principles of the Phillips curve. This historical example clearly indicates that the Lucas critique has to be taken seriously.

Historical experience also shows that moving from one equilibrium to another equilibrium was a very painful experience. The fatal experiment now called stagflation period illustrates that monetary policy induced considerable uncertainty because higher inflation rates are known to also increase the variability of inflation (McClure and Willet 1988, pp. 180-81; and Golob 1994, p. 29). As a consequence, the ability of market prices to co-ordinate the allocation of resources was obstructed. Economic agents needed time to adopt their behavior to the new situation of high inflation rates. In this process of trial and error resources were wasted (for example to produce financial innovation) but in the end the equilibrium suggested by the rational expectations approach prevailed. The trade off between inflation rates and unemployment rates observed under very different conditions broke down completely and active monetary policy produced higher inflation rates without lowering unemployment rates. Thus, the historical evidence from the stagflation period in the 1970s and early 1980s clearly suggests that it is not the elegant rational expectations version of the Lucas critique (suggesting a rather painless ride from equilibrium A to equilibrium B) but the new version of the Lucas critique presented here that makes econometrics a very dangerous tool.

A RESEARCH AGENDA

The proponents of the Austrian School of economics could use the new version of the Lucas critique presented above as an additional argument to explain their aversion to formal modelling and econometrics. Most probably some mainstream economists will accept this point of view. But without empirical evidence the Austrian version of the Lucas critique certainly will not convince many mainstream economists from the limitations of econometric

analysis. Consequently, a somewhat different research strategy will be advocated here. Austrian economists should examine historical events and empirically test the validity of the Lucas critique. Chow breakpoint tests could be used to show that changes in economic policy have produced structural breaks in relevant macroeconomic time series. Thus, econometric research should be applied in a more Austrian way to convince mainstream economists from the possible dangers of using econometric methods. Many Austrian economists probably will argue that this research strategy is not very reasonable. There are indeed some difficulties to be faced. Following Mises, econometric analysis of economic phenomena only can be an investigation in economic history. But Austrian economists regularly present discussions of historical evidence to illustrate their findings and most Austrians will accept that statistical techniques can be used to understand history. Hoppe, for example, argues:

[A]lthough questions of this nature may easily degenerate into idle semantic quibbles such as whether a glass of water is half empty or half full, empirical questions—disagreements on matters of fact—are accessible to empirical research and can, in principle, be decided upon based on the observation of the facts. (Hoppe 1997, p. 74)

Some problems remain because there are no constants in the field of human action. But economic agents will, other things being equal, most probably behave in a quite stable way. This argument has already been discussed above. As a consequence, it seems reasonable to assume that the coefficients of regression models describing the behavior of economic agents in the absence of structural breaks are also more or less stable. This assumption can be tested with tests for parameter constancy. A regression model clearly is not useful when these tests show signs of parameter instability. Otherwise, the model may be applied as a tool to examine historical events. Thus, it is not clear why some proponents of the Austrian School of economics seem to think that using empirical tests to analyze historical evidence is not acceptable at all and why they are opposed to empirically check whether their theoretical considerations can explain past events.⁴ As a matter of fact, it would be very helpful if econometric tests of the new Lucas critique could finally convince the majority of mainstream economists that government intervention cannot be justified by examining the past. While the traditional Lucas critique certainly has been very influential its general acceptance has been hampered by its reliance on the theory of rational expectations. Without tying the Lucas critique to the questionable assumptions of the rational expectations hypothesis mainstream economists favoring government intervention will have a hard time to discard the Austrian version of the Lucas critique. Experience clearly shows that the scholars of the Austrian School of economics should try to

⁴Very similar arguments regarding formal modelling are presented by Backhouse (2000, p. 40).

avoid every risk of not popularizing their more powerful version of the Lucas critique; failing to provide empirical evidence to convince mainstream economists surely would be risky.

Both versions of the Lucas critique prohibit the use of econometrics to justify government intervention of any kind because intervention necessarily leads to structural breaks. Ironically, mainstream economists regularly use econometric methods and are very likely to not follow the guidelines given by the Lucas critique. Austrian economists, on the other hand, are on principle opposed to government intervention and thus will not apply econometric analysis to justify economic policy actions but usually shy away from using econometric techniques. From this point of view an Austrian economist is the perfect econometrician. Austrians should always stress that econometric analysis is only helpful examining the past and thus cannot be applied to forecast future events. This critical attitude towards econometrics can be very helpful to produce ingenious econometric research. Austrian economists, for example, surely never would dare to run a regression without prior thinking about economic theory. Econometric research performed by Austrians clearly would also help to show that numerous proponents of active government intervention try to hide their questionable ideas behind batteries of cryptic test statistics; examining the research activities of some mainstream economists one can easily get the impression that Kenneth Boulding is not exaggerating with his ironic comments quoted above.

As a matter of fact, econometric analysis can be a very powerful research tool when certain basic rules are obeyed. Austrians definitely should not accept that this powerful tool is used solely by mainstream economists who almost certainly will disobey one of the rules by justifying policy action with their empirical work. Today many econometricians seem to be ready to understand the Austrian message. As noted above, numerous econometricians have begun to question how econometric research was performed in the past. In this context it has to be noted that there is a relatively new technique in econometrics called cointegration analysis. This technique is based on the idea that in the long run there are more or less stable relationships between certain variables. In the short run variables can move away from such long run equilibria. But if two variables are indeed cointegrated there will be a mechanism (or process) brining about a move towards equilibrium. Cointegration analysis even provides a new and probably more Austrian interpretation of equilibrium situations (Granger 1991, p. 68). Thus, the techniques of cointegration analysis are an interesting tool to examine historical data when studying market processes. It is, for example, very likely that the prices of one good in two different markets are cointegrated. The prices of two very similar goods in one market also are most probably cointegrated. These ideas seem to be very Austrian because the scholars of the Austrian School of economics have always argued that economic actions take place in time and that the neoclassical idea of equilibrium without any reference to time is not very helpful. Garrison for example notes: "Regaining a healthy respect for the temporal element

requires that we look at the market process that transforms a sequence of short runs into a long run" (Garrison 1986, p. 90).

Cointegration analysis interprets disequilibria in the short run as phenomena that will lead to processes of adjustment. Thus, cointegration analysis is an investigation in the temporal elements of market processes and can be seen as a modelling strategy that combines short-run dynamics and long-run equilibria. As a consequence, the techniques of cointegration analysis even may enable Austrian economists to apply methods of econometric research without having to sacrifice their central themes.

CONCLUSION

Lachmann once suggested that Austrian economists should actively participate in the discussion between mainstream economists to rehabilitate the ideas of the Austrian School of economics (Lachmann 1976, p. 220). This article tries to follow Lachmann by presenting an Austrian version of the famous Lucas critique. The new version of the Lucas critique is more powerful than the traditional one. It is not based on the rational expectations hypothesis and thus cannot be discarded by showing that the rational expectations approach is questionable. Moreover, while the traditional Lucas critique implies that active economic policy is ineffective (but free of costs) the Austrian version of the Lucas critique shows that active economic policy generates uncertainty and wastes resources. But it is also argued that Austrian economists should not use this new version of the Lucas critique to generally dismiss econometrics. The Lucas critique only shows that the consequences of government intervention cannot be analyzed by using econometrics. Applied in the right way econometrics in fact can be a very helpful research tool for economists studying historical events. Especially the relatively new techniques of cointegration analysis seem to be an appropriate way of studying market processes by explicitly modelling learning and the adjustment towards a new equilibrium.

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