TESTING THE LUCAS CRITIQUE IN MALAYSIA: A COMMENT

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ABSTRAK


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The advent of ‘rational expectation hypothesis’ (REH) in 1970’s sparked intense debate on the effectiveness of discretionary aggregate demand policies in influencing real economic activities. In line with this, the Lucas Critique (Lucas, 1976), that embodies the REH, questions the effectiveness of policy rule that frequently adopted in the set up of monetary policy. This commentary revisited the foundations of Lucas Critique and empirical studies reported by Habibullah, Azali dan Baharumshah (2001) (in short, HAB) on the validity of the critique within the Malaysian economy. The Lucas Critique is explained in greater detail based on an economic model that incorporates the behaviours of economic agents that form their expectation rationally. Brief
of money in income equation cannot be rejected (the same applies to null of weak and strong exogeneity), thus, supporting the time invariant hypothesis that leads to the rejection of LC's proposition. The authors conclude by favoring the use of monetary aggregates as intermediate targets for monetary policy purposes.

We read HAB's article with great interest. The article adds further evidence in analyzing the LC and contributes significantly to the issue, particularly its employment of superexogeneity test and data from a developing country such as Malaysia. In addition, it sheds further light into the mechanics of monetary conduct for Malaysian policy makers. Nevertheless, we however, feel that the article needs further (and deeper) elaboration of the LC. The insights of LC offered in the writings is too brief, impeding appreciation of issues significant to the critique and its policy implications. The foundations for LC's proposition are unclear. Further appreciation of the issues requires additional insights into the REH, pillars and implications of LC. We offer further discussions on this in Section 2. Section 3 discusses econometric issues related to HAB. To ensure that the empirical findings are rigorous, we conduct a brief re-run of the empirical analysis, focusing on the time invariant properties of the parameters with the presence of structural break. Our results indicate instability in the parameters of conditional output equation in line with the LC, contradicting the stand taken in HAB. Thus, LC invalidation requires further investigations before it can become a generalization.

THE INSIGHTS OF LUCAS CRITIQUE

An important implication of the LC is its focus on the usefulness of econometric models that explain optimal decisions of agents in determining various economic variables (such as investments, consumptions, income, and etc.) as functions of variables that summarize agents' information set in making those decisions. For all their sophisticated mathematical expressions, these econometric models generally modeled past behaviors in extrapolating future outcome. An underlying flaw of these models, according to Lucas (1976), is the improper belief that agents' behaviors are merely a straight forward extrapolations of the past, independent of policy changes. Lucas (1976, pp.41) states "...given 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..."
\[ _{t-1}X'_{t} = E (X_{t} \mid I_{t-1}) \]  

Equation (5) asserts that agents' subjective expectation of the value of \( X \) at time \( t \) form at time \( t-1 \) (\( _{t-1}X'_{t} \)) equals the mathematical expectation of \( X \) given information set (\( I_{t-1} \)) at time \( t-1 \). Thus, intuitively, agents do not make systematic mistakes and expected forecast error \( E (X_{t} \mid I_{t-1}) \) is therefore zero, reflecting the fact that, on average agents are correct in their forecasts. Conditional expectation of (2) and (3) at time \( t-1 \) equal:

\[ _{t-1}y'_{t} = \delta_{t-1}y'_{t} + \delta_{2} [ _{t-1}r'_{t} - ( _{t-1}p'_{t-1} - _{t-1}r'_{t} )] + _{t-1}g'_{t} \]  

(6)

\[ _{t-1}m'_{t} - _{t-1}p'_{t} = \theta_{1}y'_{t} - \theta_{2}r'_{t} \]  

(7)

Subtracting (6) and (7) from (2) and (3) respectively, and incorporating (4) provides the deviation of output from its natural rate:

\[ y_{t} - y^{n} = (1/D) [ \alpha \delta_{2} (m_{t} - _{t-1}m'_{t}) + \alpha \theta_{2} (g_{t} - _{t-1}g'_{t}) + \Omega_{t} ] \]  

(8)

where:

\[ D = 1 / (\alpha [ \theta_{1} \delta_{2} + \theta_{2} (1 - \delta_{1}) ] + \delta_{2} ) \text{, and} \]

\[ \Omega_{t} = [ \alpha \theta_{2} \varepsilon_{t} - \alpha \delta_{2} \varepsilon_{2t} + \delta_{2} \nu_{t} ] \]

Equation (8) conveys the Lucas, Sargent, and Wallace (LSW) policy ineffectiveness proposition, i.e., real output deviate from its natural level only in response to unanticipated money changes (\( m_{t} - _{t-1}m'_{t} \)) and unanticipated government expenditures (\( g_{t} - _{t-1}g'_{t} \)) plus random demand (\( \varepsilon_{t} \)) and supply (\( \nu_{t} \)) disturbances. Invoking rational expectation (5) where agents are on average correct in their anticipation shows that anticipated policies (monetary or fiscal) are ineffective in bringing changes to real activities.

The link between parameters of monetary rule (1) and real output path (8) can be seen by inserting conditional expectation of (1) at time \( t-1 \) into (8). Abstraction of government sectors ( assume \( g_{t} = _{t-1}g'_{t} = 0 \) ) gives:

\[ y_{t} - y^{n} = (1/D) [ \alpha \delta_{2} (m_{t} - \phi_{0} - \phi_{1} _{t-1}y - \phi_{2} _{t-1}m_{t-1}) + \Omega_{t} ] \]  

(8)

and after simplifying:

\[ y_{t} = y^{n} + \beta_{0} + \beta_{1}m_{t} + \beta_{2} _{t-1}y + \beta_{3} _{t-1}m_{t-1} + \Phi_{t} \]  

(9)

where:

\[ \beta_{0} = - (\alpha \delta_{2} \phi_{0} / D) \]

\[ \beta_{1} = \alpha \delta_{2} / D \]
HAB's rationale of using exports as proxy for income with exports based on studies that link export to economic growth should be accepted with caution. The use of exports as proxy for income may be misleading. It should be noted that these relationships depend, among others, on the stage of production and the externality effect of exports (for examples see Feder (1983) and Dodaro (1991)). According to Ramos (2001), a strong correlation between exports and economic performance has nothing to do with the GDP trend development, as this may merely arise from a purely short-run relationship. Masih and Masih (1996, p. 423) suggest that "output was relatively the leading variable being the most exogenous of all, and all other variables including money supply, rate of interest, exchange rate, and prices had to bear the brunt of adjustment endogenously in different proportions in order to accommodate that real shock." Thus, under this condition, the conditional equation such as proposed in HAB would be an incorrect way to explain variations in output.

In addition to model specifications, HAB's conclusion which supports superexogeneity is also subject to constancy of parameters for the conditional equation. Besides weak exogeneity, superexogeneity also requires constancy in the parameters of the conditional model and non-constancy in the marginal model. For the second part of the condition, we first need to test for constancy in the parameters of the marginal model. If there is constancy, there is no indication to support superexogeneity. If constancy in the marginal model cannot be fulfilled, we need to search for dummies or other variables that might model this variation. We then include these variables in the conditional model test for joint significance. If they are jointly significant, the parameters are invariant to the parameters in the marginal model, validating the LC.

Furthermore, regime switching and structural breaks also need to be considered in investigating the presence of LC, as this may affect the cointegration relationships of variables considered. The cointegration test performed in HAB does not indicate the use of the cointegration with structural breaks despite their earlier proposal that the process of financial liberalization and innovation affect interrelationships among economic variables. Campos et al. (1996) suggest the procedures for testing cointegration when structural breaks exist. We conduct a brief test on the coefficients of HAB's Equation (4) for structural breaks by observing the behavior of the recursive coefficients. As depicted in
Figure 1, clearly, there exist structural breaks, in particular, from 84:2 to 86:1, 90:1 and 93:2 onwards. Thus, the support for parameter constancy (rejection of LC) as proposed by HAB requires further investigations before it can become a generalization.

ENDNOTES


2. We are not sure whether the authors intentionally simplified elaboration on LC. The LC was ‘quickly’ brought into the discussion via several studies that investigate money-income link under liberalized and changing financial environment (Para 2, pp. 70). The main pillars of LC, especially the REH that leads to time variant proposition are not sufficiently highlighted. It seems to us that the writing focuses more on the econometric of the superexogeneity test rather than LC’s related issues. We hope our additional input has enlightened the foundations of LC and complemented HAB.

3. The full derivation of the model presented in this section is available upon request from the editorial office of the Journal.

4. For econometric efficiency HAB’s Equation (4) incorporates lagged residuals to capture seasonality at various frequencies. Conceptually this is the same as our Equation (9).

5. Another interesting work on stability is by Nieuwenhuis & Schoonbeek (1997). They investigate the relationship between the stability of macroeconomic, continuous-time models and the structure of the matrices appearing in those models. In their paper, they derive the general stability results for models with first-order and second-order adjustment lags. It explains why macroeconometric models are ‘marginally’ unstable.

6. We use the same specification as equation (4) in HAB and the notations for coefficients are consistent with equation (4). We employ monthly data set of the same variables as HAB. The data set is available upon request from the authors.


