A value equalization principle for macroeconomic models

Dimitrios Vasiliou
Athens University of Economics and Business

Abstract

The aim of this paper is to present a simple solution concept for macroeconomic models. The proposition states that the price should be determined by the condition that the value of actual output in the market be equal to the value of the equilibrium output.

The purpose of this paper is to propose a rather interesting but still very simple solution concept for macroeconomic models, in which the price level is not free to adjust to its general equilibrium level.

In the literature of macroeconomic models there are many formulations of price level dynamics which have been constructed by various authors. However, these mechanisms do not differ considerably. In the most frequently used form the inflation rate ($P_t - P_{t-1}$) is a function of the past rate of unemployment ($Y_t - Y_{t-1}$), and/or the difference of the past price level from the current full employment price level ($P^f_t - P_{t-1}$). Unfortunately, these mechanisms are relatively ad-hoc, and it is not easy to think of any theoretical justification for them.

Let us start our discussion by assuming that we are in the microeconomic textbooks' world, looking at an one-commodity Walrasian market which is in equilibrium. In addition, suppose that the equilibrium is stable, as the demand function cuts the supply function from above. An excess demand (supply) increases (decreases) the market price up (down) to the equilibrium point. Moreover, if the demand curve shifts to the right (left) in a parallel way the equilibrium price and quantity must both rise (fall). Similarly, if the supply curve shifts to the right (left), the equilibrium quantity increases (decreases) but the equilibrium price must decrease (increase). The agents in this market will be better off or worse off, depending on the elasticity of demand and supply curves. All the above are very well known, and explain how a new equilibrium point is reached when a change in the demand or supply occurred. However, the puzzling question concerns the driving force inducing these changes (e.g. shifts of either curves). Are the exogenous changes in consumers' tastes the factors that account for the shift in the demand curve? Are the exogenous changes in technology responsible for the shift of the supply curve? We think that something is missing from such explanations. The missing link seems to be the value of the change. The agents perform a change whenever they value it positively. Otherwise, they will not carry out the change. Consequently, the above changes may be thought of as the outcome of optimizing actions by market participants (i.e. producers and/or consumers). Put differently, the departure from the equilibrium point will take place if its value is non-negative for at least one of the participants in the market. Hence, a price level mechanism appears meaningful if it incorporate this value dimension. Then, one may wonder what an agent is supposed to do in face of an exogenous change. In this case the

agent will choose a price-quantity pair, and depart from this choice whenever this departure raises his/her utility. Consequently, the market participants will act in such a way that ultimately the value of actual output in the market will be equal to the value of the equilibrium bundle.

As a result, it is not implausible in a stable economic system describing the whole economy, the value of the observed (actual) output to be equal to the value of the potential full employment output. This price system deviates slightly from the mechanism one should expect following the previous discussion, but it appears much more general and simpler. Therefore, it might be thought of as a suitable surrogate for the valid price adjustment mechanism. Let P_t denote the observed price level at time t, Y_t the observed output at time t, P^f_t the potential Walrasian price level at t, and Y^f_t the potential full employment output at t. Then, the above analysis points to

$$P_t Y_t = P^f_t Y^f_t \Leftrightarrow P_t = (P^f_t Y^f_t) / Y_t$$

The preceding price mechanism, under special circumstances, gives exactly the same results as the Walrasian mechanism. The actual price level equals the Walrasian equilibrium price level, when the actual output equals the Walrasian one, and the other way round; that is, $P_t = P^f_t \Leftrightarrow Y_t = Y^f_t$. Consequently, the proposed specification may be considered as a general mechanism incorporating even the Walrasian one.

None could claim that the above adjustment will occur instantly. It might take some time until the value equalization principle accomplishes the preceding task. The factors that this time period depends upon do not seem to be known, and might vary with the lapse of time. However, we may conjecture that the procedure will not last long. This conjecture may sound like the remainder in Pandora's box, but a better answer cannot be provided from the present point of view.

From the foregoing it follows that the proposed concept is no panacea. It does not answer questions like how the price level will evolve over time and so forth. It only states that the price should be determined by the condition that the value of actual output in the market be equal to the value of the equilibrium bundle, since no agent would contemplate a change that reduced the value of actual output below the value of equilibrium output. Consequently, the value equalization principle may be best regarded as the starting point for further consideration, and not the final.