More than an Economic Theory:
Recent Research on Keynes's Economics

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I Introduction: Two Recent Books Titled "Keynes"

Recently, two books were published in succession with the same title, "Keynes." One of them is Robert Skidelsky's (2009) *Keynes: the Return of the Master*. The other is Peter Clarke's (2009) *Keynes: The Twentieth Century's Most Influential Economist*. This simultaneity is not accidental. These books were both reactions to the contemporary economic crisis after the Lehman Shock of September 2008.

Skidelsky's book is a very ambitious work. He summarized the situation of the crisis first and then surveyed the *status quo* in macroeconomics. After that, Skidelsky wrote on Keynes's life, economics, thought, and policy concerns. The last chapters investigate Keynes's legacy as it relates to the recent crisis.

Clarke's book seems a plain biography at first glance, but the introduction is titled "A Roller-Coaster Reputation." Clarke wrote that people have long wondered what the true thoughts of Keynes were. This gave rise to so much confusion and debate. But Keynes's thoughts were influenced by his times. So we have to revisit the times and rethink Keynes's thoughts in the context of his day.

The two books inspired me to make an overview of recent researches on Keynes's economics. As everyone knows, there are so many kinds of Keynesians in the field of macroeconomics. However, I shall avoid picking them one after another. Instead, I will focus on the new Keynesian macroeconomic model as the benchmark.

New Keynesian economics is well known in academic circles nowadays. But it is not necessarily understood in full, especially in regard to its macroeconomic implications. Therefore, I will concentrate on the macroeconomic structure of the model. Whether you like it or not, the new Keynesian research program has become the mainstream of contemporary macroeconomics. A historical discussion on Keynes's economics is going on under the research program. We will also check some of these papers.

The new Keynesian macroeconomic model consists of three equations. The first one is the new Keynesian Phillips curve. As is understood well, the curve explains the trade-off between the unemployment and inflation rates. The unemployment rate can be translated into the GDP gap, which refers to the divergence from the normal level of the potential GDP. Thus, in the new Keynesian version, this curve is the trade-off between the GDP gap and the inflation rate.

The second element of the new Keynesian macroeconomics is the new Keynesian IS curve. This is roughly the same as the ordinary IS curve, which explains the balance between the interest rate and the short term equilibrium GDP level. The GDP level here is also shown as the gap from the long term level. Further, we will show the possibility of a positive inclination of this curve.

The third element is the Taylor rule. New Keynesian replaces the ordinary LM curve with this one. Taylor（1993）proposed a financial policy rule while investigating central bank practices. Taylor's understanding was that central banks prescribe an interest rate in order to change the GDP gap and the inflation rate. Taylor intended to coordinate the debate between a discretional policy and a rule-based policy.

II　New Keynesian–Neoclassical Synthesis and New Keynesian Phillips Curve

Arena（2010）compared the old and new Keynesian–neoclassical syntheses. Needless to say, the old synthesis was formed by Hicks, Samuelson, Modigliani, and others, up to the 1960s. The new one is described as the new Keynesians' work. After investigating the similarity and difference between the two syntheses, Arena（2010）pointed out the compatibility of the Keynesian and neoclassical approaches. He wrote that new Keynesian macroeconomics certainly copes with Keynesian preoccupations concerning the role of aggregate demand, the nature of unemployment, and the contents of economic policy. Of course, this compatibility is not complete. Because new Keynesian economics is based on a dynamic general stochastic equilibrium（DGSE）model, it loses sight of the problem of bounded rationality and coordination failure.

In the new Keynesian system, the role of expectation and sticky prices appear in the new Keynesian Phillips curve together. The new Keynesian Phillips curve has an important difference from the ordinary one. The ordinary curve also includes an expectation term of the inflation rate, but it is the last year's expectation of this year's rate. On the contrary, the same term is this year's expectation of next year's inflation rate.

$$\pi_t = \mu + \beta E_t \pi_{t+1} + \gamma x_t + e_{\pi t}$$

Here $0 < \beta \leq 1$, $\mu > 0$, $\gamma > 0$. π_t and x_t are, respectively, the inflation rate and the GDP gap; $e_{\pi t}$ is a zero mean and the serially uncorrelated supply shock.

This characteristic of the new Keynesian Phillips curve comes from the micro foundation of new Keynesian economics. New Keynesian economics supposes that firms are price makers and that, because it costs some to change prices, the price level becomes sticky. In short, their model represents imperfect competition with sticky prices.

Blanchard and Kiyotaki（1987）proposed a new Keynesian general equilibrium model that, however, does not assume an adjustment cost of prices. Firms can change prices to the optimal level without any burden. Therefore, prices depend only on this year's variables.

On the other hand, Calvo（1983）and Yun（1996）introduced the sticky price assumption into the model. As there is some adjustment cost in changing prices, firms can only change prices at some probability. In other words, some firms can change prices this year, but others cannot.

If only $1-\rho$ firms can change prices, a single firm i faces the following problem:

$$\max_{P_{i,t}L_{i,t}} \Pi_i = E_t\left\{\sum_{j=0}^{\infty}\rho^j\delta^j(Y_{i,t}P_{i,t} - W_{t+j}L_{i,t+j} - r_{t+j}K_{i,t+j})\right\}$$

Here, $Y_{i,t} = (P_{i,t}/P_t)^{-\theta}Y_t$ is firm i's demand function, where Y_t and P_t are the total production of the industry and the general price level, respectively; δ and θ are the subjective discount factor and the price elasticity of demand, respectively.

Firms produce according to the production function $Y_{i,t} = K_{i,t}^{\alpha}K_{i,t}^{1-\alpha}$, where K is the capital and L, labor. W and r are the wage and profit rates, respectively. The general price level is the average of the new price Z of $1-\rho$ firms and the old price P.

$$P_t = [(1-\rho)Z_t^{1-\theta} + \rho P_{t-1}^{1-\theta}]^{\frac{1}{1-\theta}}$$

The optimal condition of the firms turned out to be as follows:

$$E_t\left\{\sum_{j=0}^{\infty}\rho^j\delta^j\left[P_{i,t} - \frac{\theta}{1-\theta}\left(\frac{1}{1-\alpha}ULC_{i,t+j}\right)\right]\right\} = 0$$

Here, ULC stands for unit labor cost, which is proportional to the marginal cost of production in the Cobb–Douglas production function.

This condition means that firms fixed this year's price so as to be equal to the weighted average of the marked-up marginal costs in the future. A firm may not change the price at some point in the future because of the adjustment cost. Thus, if it maximizes only this year's profit, the firm may lose future profits. So they have to decide this year's price in comparison with future prices. Such a feature of this model makes the expectation in the new Keynesian Philips curve a forward looking one.

A Phillips curve can also be derived from neoclassical models. Fischer (1977) assumed that ρ firms can set the optimal price while $1-\rho$ firms must follow the price expected by themselves last year. Then, the Phillips curve includes the expectation term, but it is last year's expectation of this year's price, not this year's expectation of next year's price.

III Distrust on Representative Individual versus New Keynesian IS Curve

Dimand (2010) treats Tobin's Keynesianism. As is well known, Tobin developed the multi-asset model of the Keynesian system and then grounded the asset demand function and consumption decision making on the optimizing behavior of rational individuals. For this reason, American post-Keynesians like Davidson and Minsky criticized him as too neoclassical. However, at the same time, Tobin rejected the representative agent model as useless for understanding the coordination problem. Thus, Tobin stayed within the old Keynesian camp till the end.

Here, we shall consider the representative household to derive the new Keynesian IS curve. It maximizes the present value of the utility flow in the future.

$$\max E_t\sum_{j=0}^{\infty}\delta^j U(C_{t+j})$$

In maximizing utility, the household has to follow the budget constraint:

$$A_{t+1} + C_t = I_t + (1+r_t)A_t$$

Here, A, C, I, and r are asset, consumption, labor income, and profit rate, respectively.

The optimal condition of the household is written in the Euler equation:

$$E_t\left[\delta\frac{U'(C_{t+j})}{U'(C_t)}(1+r_{t+1})\right]=1$$

Approximating marginal utility as $U'(C_{t+1}) \cong U'(C_t)+U''\Delta C_{t+1}$, we obtain the relation as follows:

$$E_t\Delta\ln C_{t+1}=\frac{1}{\sigma}(E_t r_{t+1}-\tau)$$

Here, $\sigma=-C_tU''/U'$ and $\delta=1/(1+\tau)$; σ is the coefficient of relative risk aversion, and τ the time preference rate.

I derive this result as a small appendix:

$$E_t\left[\left(1+\frac{U''}{U'}\Delta C_{t+1}\right)(1+r_{t+1})\right]=1+\tau$$

$$E_t\left[1+\frac{U''}{U'}\Delta C_{t+1}+r_{t+1}\right]=1+\tau$$

Here, we neglect a very small term.

$$1-E_t\sigma\frac{\Delta C_{t+1}}{C_t}+E_t r_{t+1}=1+\tau$$

$$E_t\frac{\Delta C_{t+1}}{C_t}=\frac{1}{\sigma}(E_t r_{t+1}-\tau)$$

Because $\Delta C_{t+1}/C_t \cong \ln(C_{t+1}/C_t)=\Delta\ln C_{t+1}$, we obtain the equation above. A natural logarithm is an approximation of growth ratio.

For simplicity, there is no physical capital, and net financial assets offset each other. Then, GDP is equal to consumption.

The left hand of the above equation is therefore the difference between the expectations of next year's GDP and this year's actual GDP. So by replacing them with the GDP gap, we obtain the new Keynesian IS curve.

$$x_t=E_t x_{t+1}-\frac{1}{\sigma}(i_t-E_t\pi_{t+1}-\tau)+e_{xt}$$

Here, i is the nominal interest rate, calculated through the Fischer equation $r_t=i_t-E_t\pi_{t+1}$.

Normally $\sigma>0$, but if people are risk lovers, the higher the interest rate becomes, the more they will spend.

IV　Fabricated Keynesian Revolution and the Meaning of Taylor Rule

Laidler (1999) started the fabricated Keynesian revolution story. According to him, the Keynesian revolution was largely a matter of synthesizing earlier ideas into a manageable framework. Keynes was not a lone advocate of expansionary fiscal and monetary policy in response to the Great Depression in the 1930s.

In the new Keynesian macroeconomic model, we use the Taylor rule equation in analyzing economic policies. The standard Taylor rule is as follows:

$$i_t=\tau+\pi^*+\varphi(\pi_t-\pi^*)+\omega x_t+e_{it}$$

Here, π^* is the targeted inflation rate, and $\varphi>0$, $\omega>0$. If the actual inflation rate is equal to the targeted one and there is no GDP gap, a central bank fixes the nominal interest rate to the level of the time preference plus an appropriate inflation rate. When inflation is too rapid, the central bank raises the policy rate. In the case of economic recession, the policy rate will be cut because the GDP gap is negative.

Taylor (1993) proposed this formula investigating the actual policy making process of the Fed, the United States' central bank. He had in mind the conflict between rule and discretion in the economic policy area.

The old Keynesians conducted discretional policies in the 1960s and 1970s. They recommended a reduction of the interest rate in a recession and an increase of the rate in a boom. But neoclassical economists have attacked this discretional policy style since the late 1970s. Lucas (1975) pointed out the possibility that economic policies may change the structural parameters of an econ-

omy. Then, the estimation of policy effects would go to far-fetched. This proposal is called the Lucas critique.

Soon after, Kydland and Prescott (1977) proposed the problem of time inconsistency. They stated that because people plan to allocate their labor and production among a series of time periods, policymaking without consideration of such time allocation must turn out to be a failure. Thus among academic economists, the belief that rules are much better than discretion came to be regarded as common sense economics.

Taylor, however, wrote that "[d]espite the emphasis on policy rules in recent macroeconomic research, the notion of a policy rule has not become a common way to think about policy in practice. Policymakers do not, and are not evidently about to follow policy rules mechanically" (Taylor 1993, 196).

Taylor, thus, broadened the definition of "policy rules" to provide a useful formula for policy practice. He wrote that "[a] policy rule can be implemented and operated more informally by policymakers who recognize the general instrument responses that underlie the policy rule, but who also recognize that operating the rule requires judgment and cannot be done by computer" (Taylor 1993, 198).

Nowadays, the Taylor rule seems to be adopted by almost all central bankers of the advanced countries. The annual economic report of the Japanese government stated as follows about the 2005–2006 monetary policy:

> Incidentally, there is what is called the Taylor Rule as one of the methods for setting interest rates. It is a monetary policy rule to derive a policy rate (uncollateralized overnight call rate, in the case of Japan) in accordance with economic conditions. Specifically, it is a rule to derive a policy interest rate in accordance with the magnitude of deviation of the current inflation rate from the long-term target rate and of the supply–demand gap from the equilibrium value. We estimated the policy rate derived from the Taylor Rule based on the inflation rate of 0～2% presented as an "understanding of medium- to long-term price stability." Specifically, assuming target inflation rates are from 0 to 2 percent, we estimated policy interest rates derived from the rule by using consumer price indices and the supply–demand gap estimated by the Cabinet Office. The estimation results show that the current interest rate level is in positive territory. With regard to the interpretation of the interest-rate level derived from the estimation, there are several points to keep in mind, such as supply–demand gap measuring errors and a lag in the ripple effects of the monetary policy. There are problems in deriving monetary policy management patterns on the basis of a mechanical rule. It is extremely important to have a system to stabilize economic activities by enhancing the transparency of monetary policy and thereby facilitating private sector's expectation formation. From this perspective, it is hoped that the Bank of Japan and the private sector will have proper communications under the "New Framework for the Conduct of Monetary Policy." (Japanese Cabinet Office 2006)

Here, the Cabinet Office described objectively the fact that the Bank of Japan (BOJ) has adopted the Taylor rule and that the central bank thinks much of people's confidence in the policy. In the course of the economic recovery from the "lost decade," the BOJ had shifted its policy target back to the short-term interest rate from the legal reserve. However, the last global financial crisis that started in the second half of 2008 forced central banks all over the world to adopt quantitative easing policies as the BOJ had done.

V　Conclusion: Keynes's Legacy for Economic Theory

As we now investigate the basic structure of new Keynesian macroeconomics, we shall proceed to conclude the consideration of the present situation of research in Keynes's economics.

First, the conflict among different groups of economists is coming to an end in macroeconomics. Typically, the conflict was between the Keynesian and neoclassical approaches. However, now they are also interpreted as two variations of assumptions in the same DGSE model.

Second, in the recent development of macro theories, it has become clearer that the Keynesian character of models can come from any stickiness in prices, wages, or the interest rate. What we call Keynesian models describe some optimal reactions of economic agents against such stickiness.

Third, while new Keynesian economics has become the new standard of macroeconomics as noted above, several different Keynesian theories continue to exist. Why do so many interpretations of Keynes's economics still exist? Backhouse and Bateman (2010) observed that this is because Keynes himself did not try to manage his own legacy in detail. According to them, Keynes let other people develop his theories as they wanted. This attitude of his came from his hostility to orthodoxy. Keynes learned this mentality from his experiences in the Bloomsbury Group. This group's work is wholly characterized by an intention to debunk old dogmas.

Thus, Keynes proposed no rigid economic model but left his legacy as a way to tackle severe economic problems. Almost all economists nowadays are still following this legacy.

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