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Knife-Edge Hypotheses on Market Reference Rate: A Post-Keynesian Review of Quantitative Easing Policy

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Abstract

The scale of investment is not always promoted by a *low* rate of interest as assumed by Keynes in the General Theory. This paper suggests that there may exist an appropriate level of market reference rate, which can encourage the investors to absorb the relatively wider range of credit risk in the bond market. Extremely higher market rate would discourage the borrowers to raise funds, while lower market rate would drain "risk" funds in the bond market. In this context, the appropriate level of market rate may stand on a narrow range of the kind of "knife-edge", even though the level *per se* does not always guarantee the optimal allocation of financial resources. This paper insists that there is no *a priori* mechanism in the economic theory for underpinning the commonly accepted view upon which the Quantitative Easing Policy (QEP) is based.

Keywords: *abenomics; liquidity trap; market reference rate; quantitative easing policy; risk funds*

1. Introduction

In the final chapter of *The General Theory of Employment, Interest and Money*, "Concluding notes on the social philosophy towards which the General Theory might lead", John Maynard Keynes discussed about *social justice* of tackling our economic society's arbitrary and inequitable distribution of wealth and income. First, he was concerned about the realization of a *low* rate of interest; "it is to our best advantage to reduce the rate of interest to that point relatively to the schedule of the marginal efficiency of capital at which there is full employment" (Keynes, 1936, p. 375). Second, his concern was addressed to a scheme of direct taxation on the function-less financiers to bridge the income gap; "we might aim in practice ... at an increase in the volume of capital until it ceases to be scarce, so that the function-less investor will no longer receive a bonus; and at a scheme of direct taxation which allows the intelligence and determination and executive skill of the financier, the entrepreneur *et hoc genus omne* (who are certainly so fond of their craft that their labour could be obtained much cheaper than at present), to be harnessed to the service of the community on reasonable terms of reward" (Keynes, 1936, p. 376-7).

How should we succeed a legacy of Keynes' concluding notes on social justice? The scale of investment is not always promoted by a low rate of interest as assumed by Keynes in the General Theory. Despite the availability of sufficient funds, screening and monitoring activities by functional lenders and investors still matter in order to respond to the general uncertainty from which lenders suffer, and thereby contribute to the optimal allocation of risk funds. On the other hand, the trend of *financialization* (Dore, 2000; 2011) serving that "financial markets become the pace-setters of all markets as wealth effect, positive and negative, play an increasing role in economic cycle" has been intensified. In the trend, "gambling with analysis, advice, appraisal, advertising, and commission-charging becomes a major growth industry" (Dore, 2000, p. 6). The income gap between those who are engaged as (occasionally function-less) lenders or investors in financial markets and those who are not has been widen. Our economic society seems not to have come towards the ideal direction in his mind of Keynes.

This paper aims to contemplate a legacy of Keynes' notes on social justice, focussing on the first note on social justice. In this paper, we challenge a commonly accepted view such that the increase in monetary supply would lower the market rate easing liquidity and/or credit conditions, encouraging the enterprises as borrowers to invest in their projects since their funding cost is expected to be lowered. This view implies that the increase in monetary supply would encourage the banks as financial intermediaries or the investors as fund providers to provide more funds, which results in stimulating the macro-economy. To what extent is this view held? To predict the impact of the US monetary policy in a series of Quantitative Easing Policy (QEP) and Japan's recent QEP in the so-called "Abenomics", it is very important to re-examine the theories underpinning the view.

Section 2 suggests the limited instrumental rationality in the economic theory underpinning the QEP and argues that the appropriate level of market rate may stand on a narrow range of the kind of "knife-edge". Section 3 aims to link the hypothesis to the empirical data with reference to the effect of Japan's QEP. Section 4 puts concluding comments.

2. Will Quantitative Easing Policy (QEP) generate or drain risk funds?

Besides suggesting the limited instrumental rationality in the economic theory underpinning the QEP, this section aims to argue a hypothesis that the increase in monetary supply may drain "risk" funds in the financial market. This theoretical review from the supply-side (fund providers') perspective is yet to be adequately argued in the existing literature. "Risk" funds are here meant by the funds or capital that are provided by the investors who are willing to directly undertake and absorb the risk of borrowers (or issuers in the bond market), often appearing in the direct financing route.

Quantitative Easing (QE) refers to changes in the composition and/or size of a central bank's balance sheet that are designed to ease liquidity and/or credit conditions (Blinger 2010). According to Bernanke and Reinhart (2004), when the size corresponds to expanding the balance sheet, while keeping its composition unchanged, the policy is narrowly defined quantitative easing. On the other hand, when the composition corresponds to changing the composition of the balance sheet, while keeping its size unchanged by replacing conventional assets with unconventional assets, they narrowly define the policy as credit easing. In practice, given constraints on policy implementation, central banks have combined the two elements of their balance sheet, size, and composition, to enhance the overall effects of unconventional policy. In this context, broadly defined quantitative easing, often used in a vague manner, better fits as a package of unconventional policy measures making use of both the asset and liability sides of the central bank balance sheet, designed to absorb the shocks hitting the economy (Shiratsuka 2010).

Let us begin with suggesting the limited instrumental rationality in the economic theory underpinning the QE policy. For the banks as financial intermediaries in the indirect financing route, their nominal net profit from the "floating rate" lending is not affected by the change in market rate (the reference rate [or base rate] for the banks), so far as the spread margin as risk premium towards the borrowers remains unchanged and the loan exposure remains the same. In other words, the banks' net profit from the floating rate lending is affected only if (1) the banks consider the borrowers' lowered funding cost to reasonably lower their probability of default (to increase their probability of success), then the banks are willing to increase the loan exposure towards the borrowers when higher risk-adjusted returns are expected, and (2) the borrowers increase the demand of fund-raising for their investment. The above (1) is related to the banks' *subjective* judgment of screening and monitoring, while the above (2) depends on the borrowers' *subjective* sentiment of investment.

Even though the market rate is lowered, the borrowers do not necessarily increase the demand of fund-raising (lower funding cost does not always ease the pessimistic sentiment of borrowers when the other factors, i.e. uncertainties about the product / technology obsolescence under the severe competition are more significant. Using the Keynes' term, a lowering of the rate of interest does not always stimulate investment if a lowering of the marginal efficiency of particular capital assets can offset the effect of stimulating investment). Even though the borrowers increase the demand of fund-raising, the banks do not necessarily respond

sufficiently to the demand, because their credit policy is determined at each bank's discretion. Furthermore, even though the banks expect higher risk-adjusted returns and increase the loan exposure, they do not necessarily maintain the exposure when the spread margin is adjusted (diminished) with lower credit risk profile under the competitive credit market. There is no clear-cut / no *a priori* mechanism in the relationship between the monetary policy and the loan exposure (consequently affecting the effective demand as stimulus to the macro-economy). In short, how the monetary policy can affect the macro-economy depends the lenders' subjective judgment of credit risk screening and the borrower's subjective sentiment of investment.

Furthermore, it would make sense to raise a hypothesis that the increase in monetary supply may drain "risk" funds by investors to financial markets. In a simple general equilibrium model of Arrow-Debreu as to the direct and indirect financial market, if we accept the unrealistic assumption that there were zero monitoring cost, the only possible general equilibrium would be one where all risk-adjusted interest rates are equal (Freixas and Rochet, 1997; Suzuki, 2011). In the simplistic framework, the coupon rate on bonds (denoted by r) and the lending rate (denoted by r_L) for the firms should be perfect substitutes. If one of the two rates is lower than the other, firms would prefer to raise all the funds there, resulting in the potential disappearance of the other. In reality, each borrower has distinctive credit risks related to their type and the type of activity in which they engage. Therefore, investors face significant and borrower-specific information and monitoring costs for screening and monitoring this credit risk. It is extremely difficult and costly for individual investors (particularly households) who are not professionals in monitoring to evaluate the credit risk of, in particular, small and middle-sized enterprises (SME), although it may be somewhat easier to do this for internationally reputable large firms.

Consider the floating rate notes (FRN) purchased by the investors in the corporate bond market to compare the floating rate lending by the banks in the credit market. FRN are bonds that have a variable coupon, equal to an interbank money market reference rate, like LIBOR (London Interbank Offered Rate) or federal funds rate, plus a quoted spread (margin). The spread is a rate that remains constant. Almost all FRNs have quarterly coupons, i.e. they pay out interest every three months. At the beginning of each coupon period, the coupon is calculated by taking the fixing of the reference rate for that day and adding the spread. A typical coupon would look like 3 months USD LIBOR + 1.5% (or 150 basis points or 150 bps).

The coupon rate (r) of the FRN is composed of the money market reference rate (denoted by r_{IBOR}) and the spread margin (denoted by *bps*). Basically the spread margin is reflected in the credit risk of each borrower.

$$r = r_{IBOR} + bps$$

We consider that each investor has its own benchmark which makes them expect the satisfactory profit taking into account the associated risk, bringing the prospective yield (denoted by r_Q) of the investment. The prospective yield is based on the investor's subjective judgment of screening risk and return. In theory, if $r_Q > r$, the investor would not engage in the investment. On the contrary, if $r_Q < r$, it means that the coupon rate would be attractive for the investor. In other words, the minimum condition for engaging in the investment, r_Q should be equal to r.

$$r_Q \leqq r$$

substitute $r = r_{IBOR} + bps$, then we can obtain the following conditions;

$$r_Q - r_{IBOR} \leqq bps \qquad \text{or,}$$

$$r_Q - bps \leqq r_{IBOR}$$

Assume that the spread (*bps*) as risk premium for each borrower remains unchanged at least in the short-term period. When the market rate (r_{IBOR}) decreases, if the investors seek for the fixed prospective yield, they may have less incentives to hold the bond in the same credit risk category. Some of them may have an incentive to engage in the other bond offering higher spread. However, the bond offering higher spread is associated with higher credit risk. Particularly for the *risk-averse* investors who are not professionals in monitoring to evaluate the credit risk of unknown or SME, r_Q would be closer to for engaging in the high-yield junk bonds.

Rather, when the market rate (r_{IBOR}) decreases, some investors may have an incentive to leave for the other "low-risk and low-return" type bond which is on the same indifference curve of the risk-return preference. To illustrate this, assume that there are two bonds; one is "high-risk and high-return" type bond (Bond A, in which the spread is, for instance, 2%), while the other is "low-risk and low-return" type bond (Bond B, in which the spread is 0.5%). When the market rate stays at 5%, the coupon rate (r) of Bond A becomes 7% (5+2), while that of Bond B is 5.5% (5+0.5). When the market rate decreases to 1%, the coupon rate of Bond A would be 3% (1+2), while that of Bond B would be 1.5% (1+0.5). As the market rate (r_{IBOR}) decreases, the weight of r_{IBOR} in the coupon rate would decrease (5/7 [71.4%] to 1/3 [33.3%] in Bond A, 5/5.5 [90.9%] to 1/1.5 [66.7%] in Bond B) if the spread remains unchanged. For the cash-rich investors who do not have to borrow the funds for purchasing the bond, the weight of r_{IBOR} in the coupon rate functions as a buffer or cushion for absorbing the issuer's credit risk which is reflected in the spread margin. In the above case, the weight of buffer in the coupon rate of Bond A would decrease if the market rate decreases. On the other hand, the weight of spread in the coupon rate of Bond B would increase (from 9.1% to 33.3%) even though the associated credit risk remains unchanged. As a result, some risk-averse investors would leave for Bond B, because they feel that the weight of buffer (1/3) is not enough to absorb the 200 bps risk and the weight of spread (1/3) is attractive to absorb the 50 bps risk.

We hypothesize that as the market rate decreases, more investors would lose the incentive to absorb higher credit risk, in other words, lose the incentive to provide "risk" funds because the market rate functions as a buffer for absorbing credit risk for the cash-rich and risk-averse investors. If this hypothesis is not rejected, it may explain a dimension of the cause of "liquidity trap" (Krugman, 1998), which is yet to be focused in the academic literature.

For the banks being engaged in the floating rate lending, the lending rate (r_L) is determined by each bank's funding cost (the base rate covering the funding cost, denoted by r_{BR}) and the spread (*bps*) for each borrower. The funding cost is reflected in, for instance, the deposit rate (denoted by r_D), the money market reference rate (r_{IBOD}), the propensity to pay dividends (funding cost from equities, denoted by *div*) which is reflected in the policy for capital adequacy requirement, and the operating and administration cost (denoted by *op*).

$$r_L = r_{BR} + bps,$$

where

$$r_{BR} = f(r_D, r_{IBOD}, div, op)$$

As mentioned earlier, in a simple general equilibrium model of Arrow-Debreu as to the direct and indirect financial market, the coupon rate on securities (r) and the lending rate (r_L) for the firms should be perfect substitutes. If this condition is held,

$$r_{IBOD} + bps = r_{BR} + bps$$

therefore, we can reach to the following condition for the equilibrium.

$$r_{IBOD} = r_{BR}$$

In reality, this condition is not held. This is because the other factors such as deposit rate (r_D) and propensity to pay dividends (*div*) in each bank may vary in the determination of the base rate (r_{BR}). One of the implication is that (1) if the bank relies only on the interbank money market for funding, and (2) if the bank has no obligation to keep the capital adequacy requirement (or if the bank has the same liability composition and cost of deposit and equity as the reference bank) and also (3) if the operating cost is identical to that of the reference bank which offers the money market reference rate, it is possible to hold the condition for a partial equilibrium in financial market. In practice, we often observe that r is lower than r_L particularly for prominent borrowers. It implies that the funding cost in the average banks is higher than that in the reference bank. On the other hand, there are few capital/bond markets for SME because the risk-averse investors would not engage in the high yield junk bond even though the high spread [*bps*] is offered, where the weight of base rate [r_{BR}] would become less meaningful for the investors. As a result, only the debt (bank loan) market is available for SME and marginally creditworthy borrowers.

As an alternative explanation leading to the situation where $r < r_L$ for prominent borrowers, we hypothesize that the risk preference of the investors (particularly households) may swing to a "risk-neutral/loving" or "euphoric" position towards the investment in prominent issuers. When the money market reference rate (r_{IBOR}) provides an adequate buffer for undertaking the associated risk, their subjective judgment of $r_Q < r$ will possibly lower the coupon rate through accepting the lower spread (*bps*) applied for the bond in the long run. On the contrary, when the money market reference rate decreases, the reduced credit risk buffer may lead the risk preference of the investors swing back to a "conservative" or "risk-averse" strategy for the investment, consequently draining "risk" funds in financial market. It is considered that the subjective prospective yield (r_Q) from the investment in a particular FRN is determined by the money market reference rate, the spread and the risk preference (. When the risk preference lies in the risk-neutral position, The risk-loving preference would have an effect on accepting the lower yield, while the risk-averse preference would require higher risk premium or keep the investors completely away from the investment. It is worth noting that the risk preference or sentiment even in an individual may possibly swing all the times.

$$r_Q = f(r_{IBOR}, bps,)$$

The coupon rate (r) and the floating lending rate (r_L) are considered to have a certain realistic upper limit. This is because higher rate would discourage the issuers (or the borrowers) to raise funds. The spread margin (*bps*) is also considered to have a certain realistic upper limit. This is because the extremely high spread based upon less creditworthy non-rated firms would not attract any investor nor any conservative bankers.

We hypothesize that the portion of the money market reference rate (r_{IBOR}) functions as a buffer for the investors to absorb the issuer's credit risk. An adequate level of buffer may shift the investor's risk preference to a risk-neutral or risk-loving direction, lowering the prospective yield (r_Q) and possibly providing more "risk" funds in the bond market. Under this situation, it is likely that the coupon rate (r) would be lower than the floating lending rate (r_L) for the firms in the same and certain range of prominent / acceptable credit risk category.

When the market reference rate decreases, the reduced buffer may shift the investor's risk preference to a risk-neutral or risk-averse direction, requiring relatively higher prospective yield against the coupon rate, resulting in the situation where $r_Q = r$ or $r_Q > r$. This situation would discourage the investors to engage in the bond, or encourage them to leave for the low-risk-low-return type bond as mentioned earlier. From another perspective, as the market reference rate decreases, the convergence of debt and bond markets is accelerated

in a sense that the banks would regain the comparative advantage in mediating funds, though the banks do not necessarily mediate funds.

3. Linkage hypotheses to empirical data

Several empirical studies on QE are conducted. For instance, Ugai (2006) surveys the empirical analyses that examine the effects of the Bank of Japan (BOJ)'s QE policy, which was implemented from March 2001 through March 2006. Ugai (2006) points out that the QE effect on raising aggregate demand and prices was often limited, generally this effect, if any, was smaller than that stemming from the commitment, due largely to the progressing corporate balance sheet adjustment, as well as the zero bound constraint on interest rates. Joyce *et.al* (2010) attempt to assess the impact of the Bank of England (BOE)'s QE policy on asset prices which began in March 2009. They estimate the reaction of gilt (UK government securities) prices to the program and suggest that QE may have depressed gilt yields. But they point out that the initial impact of GE was muted, and the wider impact on other asset prices is more difficult to disentangle from other influences.

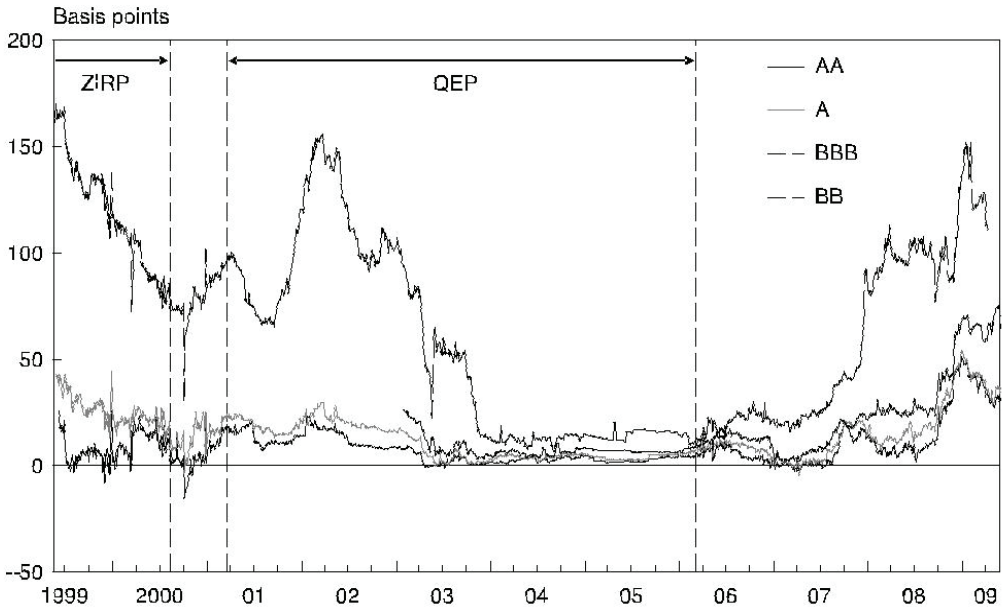
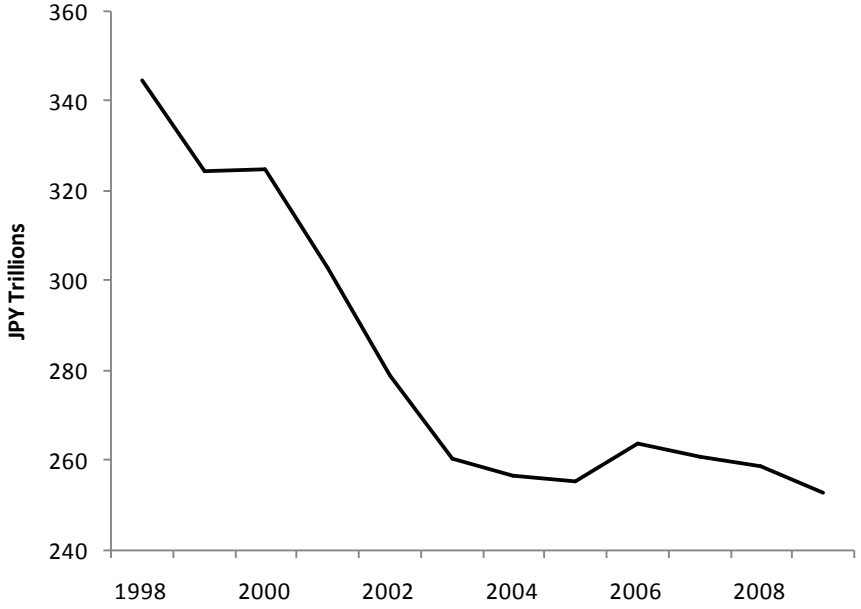


Figure 1: Nonfinancial business: Bloomberg Fair Market Value Index for companies with rating AA, A, BBB, and BB (*Source: Shiratsuka 2010, p. 90*)

Shiratsuka (2010) re-examines the Bank of Japan's experience of QEP from 2001 to 2006, pointing out that the credit spreads for nonfinancial businesses, measured as the differences between the credit product indicators across ratings and the TB rate in three-month contracts, declined but with certain time lags after the introduction of the QEP (rather, the credit spreads for the BB-rated firms were enlarged during around one year after the introduction, see figure 1). In spite of a general reduction in the external financing premium in a middle-term range, the level of lending by private Japanese banks continued to be shrunken. The outstanding loans towards small and medium-sized enterprises (SME) had dropped sharply - from \344.9 trillion in December 1998 to \260.3 trillion in December 2003, then to \253.1 trillion in December 2009 (Suzuki 2011, p. 5, see figure 2). Several empirical studies point out the limited effect of QE, however, the existing debate seems not to sufficiently explain the reason of the limited effect of QE.

Shiratsuka (2010), a staff of the Bank of Japan, raises several policy implications from the analysis on the Bank of Japan's QEP from 2001 to 2006. In particular, he points out that QE is a temporary policy response. "The increase in size and the change in composition of the central bank balance sheet simply buy time until certain progress can be made in balance-sheet adjustments at financial institutions, such as disposal of non-performing assets and recapitalization. The increase in size and the change in composition of the central

bank balance sheet do not directly lead to the early restoration of the financial intermediation function" (Shiratsuka 2010, p. 99). In addition, he points out that QE is likely to produce side effects such as the corollary of public intervention in private financial transactions, potentially distorting incentives and resource allocation in the private sector.



Source, SMEA 2005, 2010

Figure 2: Changes in the outstanding loans towards SME

4. Concluding comments

Our analysis suggests that there may exist an appropriate level of market reference rate, which can encourage the investors to absorb the relatively wider range of credit risk in the bond market. Extremely higher market rate would discourage the borrowers to raise funds, while lower market rate would drain "risk" funds in the bond market. In this context, the appropriate level of market rate may stand on a narrow range of the kind of "knife-edge", though the level *per se* does not always guarantee the optimal allocation of financial resources. Our hypothesis suggests that there is no clear-cut mechanism in the economic theory for underpinning the commonly accepted view upon which the QEP is based.

The scale of investment is not always promoted by a *low* rate of interest as Keynes assumed in the General Theory. Keynes suggested that we aim in practice at "an increase in the volume of capital until it ceases to be scarce, so that the functionless investor will no longer receive a bonus" (Keynes, 1936, p. 376). On the other hand, despite the availability of sufficient funds, screening and monitoring activities still matter because the failure of monitoring by (function) lenders and investors would exacerbate the principal-agent problem or the general uncertainty from which lenders suffer, and thereby restrict the optimal allocation of risk funds. In my view, lenders and investors need a certain buffer or cushion for providing risk funds, in other words, for responding to the fundamental uncertainty. Under the unprecedented QEP in several developed countries, we should review the function of rate of interest as an incentive for lenders and investors to provide risk funds to the future potentials.

The developed economies such as the US and Japan continue to rely heavily on the QE as an instrument to continuously stimulate the economies. We should take more care of the above side effects that become more obvious as the duration of quantitative easing is prolonged. Knife-edge hypotheses on market reference rate should be argued to examine the side effects or by-products of the QEP.

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