Monetary Policy:
Its Effects and Implementation:

Summary of the 2015 BOJ-IMES Conference Organized by the Institute for Monetary and Economic Studies of the Bank of Japan by Yushi Endo, Takushi Kurozumi, Takemasa Oda, and Kenichirou Watanabe

The Institute for Monetary and Economic Studies (IMES) of the Bank of Japan (BOJ) held the 2015 BOJ-IMES Conference, titled "Monetary Policy: Its Effects and Implementation," on June 4–5, 2015 at the BOJ Head Office in Tokyo. The conference was attended by about 90 distinguished participants from academia, international organizations, and central banks. The participants discussed a wide range of issues concerning the effects and implementation of unconventional monetary policy. In his opening remarks, the BOJ Governor Kuroda raised several issues that central banks currently faced, for instance, the effects of unconventional monetary policy and its transmission channels. In the policy panel discussion, five panelists from central banks and academia, together with conference participants, discussed the issues and the thesis of secular stagnation, which had attracted growing attention in recent years. There were also five paper sessions presented by professors and central bank economists, which addressed various issues including relationship between maturity structure and supply factors in Japanese government bond markets. The conference closed with the Mayekawa Lecture on secular stagnation.

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I. Introduction

The Institute for Monetary and Economic Studies (IMES) of the Bank of Japan (BOJ) held the 2015 BOJ-IMES Conference, titled "Monetary Policy: Its Effects and Implementation," on June 4–5, 2015 at the BOJ Head Office in Tokyo. The conference was attended by about 90 distinguished participants from academia, international organizations, and central banks.[1] The participants discussed a wide range of issues concerning the effects and implementation of unconventional monetary policy (UMP).

The conference began with the opening remarks delivered by the BOJ Governor, **Haruhiko Kuroda**. In the policy panel discussion moderated by **Takatoshi Ito** (Columbia University, National Graduate Institute for Policy Studies), there were five panelists: **Stephen G. Cecchetti** (Brandeis International Business School), **Marvin Goodfriend** (Carnegie Mellon University), **Ravi Menon** (Monetary Authority of Singapore), **Hiroshi Nakaso** (BOJ), and **Lucas Papademos** (Bank of Greece). There were also five paper sessions presented by **Jonathan H. Wright** (Johns Hopkins University), **Roland Straub** (European Central Bank), **James J. McAndrews** (Federal Reserve Bank of New York), **Ichiro Fukunaga** (BOJ), and **Neil R. Mehrotra** (Brown University). The conference closed with the Mayekawa Lecture delivered by **Barry Eichengreen** (University of California at Berkeley).

II. Opening Remarks[2]

In his opening remarks, **Kuroda** raised several issues that central banks currently faced, and emphasized the importance of a positive attitude and conviction to address the issues, quoting a line from *Peter Pan*, "The moment you doubt whether you can fly, you cease forever to be able to do it."

Kuroda began his remarks by reviewing the recent developments in global economic conditions noting that diverging directions of monetary policy among advanced economies had become increasingly apparent over the past year. He then raised three current issues concerning the conduct of monetary policy. The first issue involved the effects of UMP and its transmission channels. The second issue pertained to inflation expectations and the decline in crude oil prices. He pointed out that the plunge in crude oil prices since 2014 had posed a new challenge for the conduct of monetary policy. The third issue was how to deal with international spillovers induced by diverging directions in monetary policy among advanced economies.

Subsequently, in light of recent discussions over slow post-financial crisis recoveries in academic and central bank circles, **Kuroda** raised three policy issues from a long-term perspective. The first issue was the extent to which central banks should consider the impact on the supply side of the economy in conducting monetary policy. This issue was related to an interaction between supply and demand that has been pointed out as a background factor in slow post-financial crisis recoveries. The second issue involved the question of which monetary policy tools were desirable under

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1. See Appendix 1 for the program. See Appendix 2 for the list of participants; their affiliation is as of June 4–5, 2015.
2. For details, see Kuroda (2015).

a low natural rate of interest. The third issue concerned the optimal policy mix for an economy undergoing medium- to long-term stagnation with a low natural rate of interest.

III. Policy Panel Discussion

The policy panel discussion was moderated by **Ito**, with five panelists from academic and central bank circles: **Cecchetti**, **Goodfriend**, **Menon**, **Nakaso**, and **Papademos**. **Ito** began the panel discussion following Kuroda's opening remarks by posing four topics: (1) the effects and transmission channels of UMP; (2) inflation expectations; (3) international spillovers caused by diverging directions of monetary policy among advanced economies; and (4) secular stagnation. Each panelist spoke on some of these four. General discussion with conference participants followed.

A. Remarks by Panelists

Cecchetti gave a presentation entitled "Unconventional Monetary Policy: Transmission and Spillovers." Regarding monetary policy transmission, he pointed to channels through which monetary easing influenced the real economy: (1) reducing the cost of investment; (2) raising values of equity, real estate, and other assets; (3) increasing the net worth of nonfinancial firms and households; (4) improving banks' capital and lending capacity; (5) reducing asset price volatility; and (6) putting depreciation pressure on the domestic currency. He noted that many of the channels influenced household and corporate balance sheets; and that some necessarily had international spillovers. He next commented on monetary policy tools, indicating that these comprised both the conventional one—the short-term interest rate—and unconventional ones, such as forward guidance, quantitative easing (QE), and target asset purchases. He observed that both had similar channels of transmission, altering financial conditions, so what was now commonly referred to as unconventional was actually quite conventional. He added, however, that we lacked sufficient experience and quantitative knowledge to accurately calibrate UMP tools. He also stressed that UMP was not new, in light of the past experiences of the BOJ in the early 2000s and the Hong Kong Monetary Authority in 1998. He closed his remarks by questioning the need for international cooperation or coordination of monetary policy even in the presence of international spillovers. That is, international policy cooperation or coordination would be suboptimal, because it could result in lower economic growth in a major country.

Goodfriend gave a presentation titled "US Economic Situation and Perspectives on Central Bank Polices." He began his remarks by presenting the latest forecasts for the U.S. economy. Regarding the participation rate, he expressed concern about the possibility of disincentives for participating in the U.S. labor markets. He then moved on to a talk about perspectives on central bank policies. This talk focused on a taxonomy of central bank policies, their transmission channels, and fiscal policy features. Four types of central bank policies were introduced. The first was pure monetary policy, which controlled bank reserves and influenced economic activity through the effects of expected future interbank rates on longer-term interest rates. The second type was

credit policy, which aimed to reduce credit spreads and shift credit risk to taxpayers. The third type was interest on reserves policy, which literally paid interest on reserves. The fourth type was QE (or bond market carry trade policy in his terminology), which worked through a portfolio rebalancing channel and a credit channel. He stressed that these central bank policies differed markedly in various respects, such as the mechanics, transmission, financial costs and benefits, risks for central banks and taxpayers, and implications for fiscal transfers between monetary and fiscal authorities, despite the fact that central banks usually referred to all of them solely as monetary policies. He closed his presentation by cautioning that all the central bank policies had fiscal aspects, and thus central banks needed to distinguish among these central bank policies and clarify the boundary of their independent responsibilities.

Menon discussed three points concerning the normalization of monetary policy in advanced economies and its spillover effects on emerging market economies (EMEs). First, the normalization of monetary policy in the United States, while a good thing, was fraught with difficulties, since policy decisions were data dependent and uncertainty remained as to the degree of slack in the economy, as revealed by estimates of the non-accelerating inflation rate of unemployment (NAIRU) and the output gap. In this context, he wondered whether the Federal Open Market Committee (FOMC) had placed too high a threshold before initiating monetary policy normalization. Second, he indicated that there was significant uncertainty about how financial markets would behave when monetary policy stimulus was unwound. For instance, there were some indications that long-standing interest rate relationships between the United States and other countries could have been altered, at least temporarily, by unconventional monetary policies. Third, he argued that the sharply diverging monetary policies among advanced economies had significant spillover effects on EMEs, principally through global currency markets. He expressed concern that the widening of interest rate gaps between the United States and other advanced economies could lead to a super-strong U.S. dollar and trigger significant realignments in exchange rates around the world. These developments suggested that exchange rates could become shock transmitters rather than shock absorbers, especially for EMEs. He suggested that central bankers could not afford to treat the exchange rate as a residual by-product of monetary policy, because exchange rate adjustments could potentially overwhelm the ability of some EMEs to cope, given their shallow financial markets.

Nakaso gave a presentation titled "Japan's Lost Decades and the QQE-Driven Escape." He discussed Japan's experience with secular stagnation and gave an interim assessment of the Japanese economy's escape from a deflationary equilibrium driven by the BOJ's quantitative and qualitative monetary easing (QQE). Regarding Japan's lost decades, he indicated that the prolonged economic slump since the 1990s was attributable to a combination of factors, including demography as well as deleveraging and the malfunctioning of financial intermediation, in line with the recent debate on the secular stagnation hypothesis in the U.S. context. However, he stressed that there was another very important factor: deflation. He was inclined to support the hypothesis that Japan's economy had fallen into a deflationary equilibrium during the latter phase of Japan's lost decades. That is, deflation following Japan's banking crisis in the 1990s had lowered the expected inflation rate, and over time deflationary expectations had

become self-fulfilling. He reiterated that to put an end once and for all to deflation, the BOJ launched QQE in April 2013. As for the interim assessment of the QQE-driven escape from a deflationary equilibrium, he pointed out that QQE's reduction in real interest rates—by lowering nominal interest rates and raising inflation expectations—had pushed up both the output gap and inflation, and thus QQE had worked as intended. He closed his remarks by presenting an idea borrowed from evolutionary game theory that facilitated an understanding of the mechanism of the QQE-driven escape from the deflationary equilibrium.[3]

Papademos gave a presentation titled "Unconventional Monetary Policy: Transmission Channels, Impact and Effectiveness." He addressed five issues pertaining to UMP, with emphasis on the measures adopted by the European Central Bank (ECB). First, he indicated that UMP measures had usually taken three forms: (1) management of expectations about the future path of policy rates (forward guidance); (2) outright large-scale purchases of assets by the central bank (QE); and (3) non-standard refinancing operations aimed at improving the provision of bank loans (credit easing). The ECB had implemented various UMP measures since 2007, but, until 2015, they were mainly forms of credit easing, the choice reflecting the eurozone's bank-based financial structure. Second, he summarized six transmission channels of the measures taken by the ECB since the summer of 2014, notably the targeted longer-term refinancing operations (TLTROs) and the asset purchase program (APP). Third, he reviewed the impact of the UMP announcements and operations since June 2014 on bond yields, equity prices, the euro exchange rate, inflation expectations, and the provision of bank credit, concluding that it was in line with policy aims. Fourth, he assessed positively the measures' longer-term effectiveness in achieving the objectives of price stability and stronger growth, stressing three reasons: (1) the cumulative effect of the measures through all transmission channels would be powerful, especially via the exchange rate channel; (2) the portfolio rebalancing effects on both banks and non-banks would continue to be strong; and (3) the ECB's two programs, APP and TLTROs, would have complementary and mutually reinforcing effects. Fifth, he argued that a prolonged period of very low policy rates and UMP measures could entail several risks to financial and macroeconomic stability and have other undesirable consequences, such as distributional effects, postponement of reforms and fiscal adjustment, as well as spillovers to other economies; and he drew policy implications. He closed his remarks by emphasizing the importance of taking into account several growth-constraining factors—such as structural weaknesses, high public debt relative to GDP, a potential decline in productivity growth—when designing the appropriate policy strategy for growth and stability in the eurozone and elsewhere.

B. General Discussions

Regarding Cecchetti's remark that UMP was quite conventional, **Michael Dotsey** (Federal Reserve Bank of Philadelphia) questioned Cecchetti's approach for discussing differences between conventional and unconventional monetary policies. Specifically, he

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3. Evolutionary game theory—which was proposed by the British theoretical biologist John Maynard Smith and others in the 1970s—is an application of game theory to processes of biological evolution.

noted that affecting term premia for certain specific maturities on specific assets was different from affecting the entire position of the expected path of future short-term rates, which would affect the term structure across all asset classes. He also mentioned that the linearly approximated term structure used by Cecchetti was too simplistic as it avoided consideration of covariance terms of the original nonlinear term structure, which were primarily responsible for affecting changes in term premia. **Kuroda** indicated, as Cecchetti also acknowledged, that quantitative knowledge and experiences of UMP were very limited compared with conventional policy. He also pointed out that UMP differed from conventional monetary policy because the costs of normalization of unconventional policy might matter, as argued by Goodfriend in the context of the bond market carry trade policy. That is, when a central bank expanded its balance sheet, its profits tended to soar; on the other hand, when the balance sheet was reduced, its profits tended to decline and could even become negative. **Cecchetti** agreed with Kuroda's point and stressed that we should keep in mind the costs and benefits of UMP, presenting a recent policy change in Switzerland as an example. Regarding the question raised by **Hiroshi Fujiki** (Chuo University) about the optimal size of the balance sheet of the Federal Reserve System (Fed) after its policy normalization, **Goodfriend** answered that the optimal size should be large enough that the federal funds rate was kept at a sufficiently low level from the perspective of the Friedman rule.

   Straub indicated that, given the taxonomy of central bank policies discussed by Goodfriend, both conventional and unconventional policies had fiscal implications and unintended consequences, so what was crucial was not the type of instrument used but whether monetary policy acted within the same stability mandate, following the same objectives. In this context, **Kazumasa Iwata** (Japan Center for Economic Research) mentioned that unconventional monetary policies approached fiscal policy ("helicopter money") as the role of QE increased. **McAndrews** argued that even the pure monetary policy mentioned by Goodfriend could have a fiscal implication, referring to U.S. monetary policy carried out by Paul Volcker in the early 1980s. He then discussed the experiences of the Federal Reserve Bank of New York during the last financial crisis and stressed that it was important for central banks to preserve their transparency when fiscal risks arose from their UMP. **Goodfriend** commented that central banks needed to clarify the boundary of their responsibility to maintain their independence.

   As for credit policy, **Woon Gyu Choi** (Bank of Korea) asked for a comment on the validity of expanding credit policy to the non-banking sector in addition to the banking sector in South Korea. **Goodfriend** commented that it was possible to use credit policy to connect or reconnect markets segmented in a particular country, but when doing so it was valuable to acknowledge that central banks were using credit policy rather than monetary policy and that what they were actually doing was beneficial. For the questions about negative interest rate policy raised by **Kazuo Momma** (BOJ) and **Kazuo Ueda** (University of Tokyo), **Goodfriend** indicated that the fact that negative interest rate policy worked only in countries in the eurozone was evidence of a very severe situation in that region. He also pointed out that money market mutual funds were less developed in the eurozone than in the United States. **Papademos** remarked that the negative interest rate on the ECB's deposit facility was complementary to and supportive of the central bank's credit-easing policies, notably the longer-term refinancing

operations, as it is mainly aimed at encouraging banks to provide credit to the economy instead of depositing borrowed funds with the ECB.

On the argument by Menon about the spillover effects of UMP in advanced economies on EMEs, **Juda Agung** (Bank Indonesia) commented that the monetary policy transmission of the ECB's QE worked through banks because of the bank-based financial system in Europe, and therefore the spillover effects from the eurozone to EMEs might be more limited compared with those from the United States, where the financial system was market-based. He added that the Indonesian economy had not observed a significant impact from the ECB's QE. **Masahiro Kawai** (University of Tokyo) pointed to the possibility that the divergence of monetary policy among advanced economies had limited impacts on countries where the exchange rate was allowed to fluctuate against a basket of major currencies, because the effects of U.S. dollar appreciation could be offset to some extent by the effects of currency depreciation in advanced economies where monetary easing continued. **Menon** commented that while exchange rate targeting could work well for small open economies, medium-sized ones—including not only EMEs but also advanced economies such as Switzerland—might face a dilemma, as for them both the exchange rate and interest rates had important effects on aggregate demand and inflation. These countries must therefore pay attention to both exchange rates and domestic interest rates.

Regarding international coordination of monetary policy, **Choi** claimed that such coordination would be optimal if repercussions from EMEs were fed back to advanced economies. **Kawai** also indicated that the feedback effects from EMEs could not be ignored because the aggregate economic size of EMEs was sufficiently large compared to the United States, and thus international coordination would be valuable for advanced economies. **Andrzej Rzońca** (Narodowy Bank Polski) argued that policy coordination resulting in less unconventional policy in major economies might be worthwhile in a case where the expected marginal cost of unconventional policy measures—derived from their possible side effects—dominated their expected marginal benefit. He asked panelists whether the current sluggishness in recoveries in major economies implied such a dominant marginal cost of unconventional policy measures. **Cecchetti** commented that benefits of policy coordination in terms of welfare were seen as small from the perspective of the relevant literature, and therefore it was important for each economy to privately optimize its policy. **Papademos** noted that, in principle, the central banks of advanced economies should take into consideration the spillovers of their monetary policies on EMEs and potential feedback effects. Such effects, if significant, could encourage international monetary policy coordination. In practice, coordination of monetary policies would be very difficult because national monetary policy has to achieve domestic policy objectives—price stability and economic growth—as specified in the central bank's statute and in the relevant law. As another form of policy coordination, **Kawai** proposed strengthening financial safety nets, such as the International Monetary Fund and a bilateral currency swap arrangement between countries and, especially, the United States. **Nakaso** commented that swap lines were a major invention of central banks to address a financial crisis, but this was intended to be a backstop, and the issue of moral hazard arising from such safety nets should be considered.

Regarding Nakaso's presentation, **Choi** asked how Japan's economy was escaping

from a deflationary equilibrium. **Nakaso** pointed to the difficulty of changing the mindsets of a wide variety of economic agents, but mentioned that the BOJ's current policy was achieving success in changing mindsets and contributing to the current economic improvement in Japan. In response to **Kazumasa Iwata**'s question on how QQE could encourage a low natural interest rate, **Nakaso** commented that QQE contributed to strengthening supply capacities by stimulating investment—"animal spirits"—which expanded the growth potential and increased the natural interest rate. **Jan Marc Berk** (De Nederlandsche Bank) argued that to escape an economic downturn, most of the current monetary policies intended to encourage risk-taking behavior, which could lead to economic and financial bubbles. He asked how monetary policy and financial stability should be considered. In this context, **Yuzo Honda** (Kansai University) mentioned an example in which the Bank of England had recently introduced a new regulation to control land prices as a precautionary measure, from the perspective of macroprudential policy. **Papademos** commented that monetary policy should take financial stability considerations into account by being defined over a longer time horizon and by assessing the macroeconomic consequences of emerging systemic risks, particularly those fueled by excessive credit creation. In an environment of deflationary pressure and weak economic activity, monetary policy should focus on achieving its price stability objective; at the same time, and especially as the economy strengthens, the central bank should address potential adverse effects on financial stability of monetary policy with the support of macroprudential tools.

IV. Paper Presentation Sessions

A. Forward Guidance and Asset Prices[4]
In the wake of the global financial crisis, forward guidance on the future path of the policy rate has become an important policy tool for many central banks. **Wright** presented empirical results on the effects of forward guidance in the context of the United States. The empirical analysis consisted of two parts. The first estimated a macro-finance term-structure model of the U.S. economy that incorporated the zero lower bound (ZLB) on nominal interest rates, and used the model to explore the effects of various types of forward guidance. These types included an unconditional commitment under which the policy rate would be kept at zero for two years and a conditional commitment under which the policy rate would be kept at zero until the unemployment rate hit 5.5 percent. The second part of the analysis conducted event-study regressions regarding surprises to future policy rates that could capture a change in forward guidance, and estimated their effects on asset prices. Based on the empirical analysis, he argued that forward guidance operated through its effect on long-term interest rates by affecting term premia in addition to the expected future path of the (short-term) policy rate through the expectations hypothesis of the term structure of interest rates. Indeed, according to the estimated model, both the conditional and unconditional commitments, if conducted at the end of 2013, would have increased the term premia but lowered the long-term

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4. For details, see Akkaya *et al.* (2015).

interest rates. The results of event-study regressions suggested that surprises to future policy rates would affect stock prices and exchange rates as well. Furthermore, he indicated that the effect of forward guidance depended on the state of the economy. In particular, when the economy was far from interest rate normalization, a commitment to keeping the policy rate low for some time had little effect on long-term interest rates. For this reason, he stressed that additional forward guidance would not generate a large amount of monetary easing effects in the euro area and Japan in the present situation.

The discussant, **Berk**, praised the presented paper for its interesting empirical results. He then indicated that the results depended on several assumptions and raised three main issues related to them. The first issue was that the estimated macro-finance term-structure model assumed no changes in values of model parameters, suggesting that the Fed had kept its policy reaction function unchanged since 2008, which was unlikely to be plausible. The second issue was that other models with different specifications or identification assumptions would generate various results on the monetary policy stance, so robustness exercises using these models were desirable. The third issue was that the persistent monetary policy shocks assumed in the presented paper were likely to overestimate the impact of forward guidance, as argued in the recent literature. Thus, it was desirable to conduct another robustness exercise with no persistence in the monetary policy shocks. **Berk** closed his discussion with the remark that these issues had to do not with the presented paper itself but with macro-finance term-structure models in general and that the paper provided interesting insights on the conduct of monetary policy.

From the floor, **Goodfriend** commented that forward guidance could only be effective if it was used in conjunction with balance-sheet policy, including asset purchase programs. In this context, **Ito** indicated that forward guidance had worked in Japan because it had been combined with QQE and the price stability target of 2 percent. In his responses to these comments, **Wright** agreed that asset purchase programs probably had greater effects on long-term interest rates than forward guidance. **Cecchetti** asked why monetary policy was analyzed in terms of monetary policy shocks that were unrelated to a systematic part of monetary policy. **Choi** noted that monetary policy shocks measured as an additive term to a monetary policy rule might not be sufficient to capture a monetary policy response to inflation in a deflationary trap. In reply, **Wright** admitted that there was some limitation in capturing a monetary policy response in terms of shocks, but insisted that such shocks were still useful for analyzing monetary policy. **Straub** commented that an international dimension was missing in the analysis. **Momma** asked how the presented paper would interpret the "taper tantrum" in 2013. **Wright** replied that this could be interpreted as a question of credibility, which was not present in the model, which assumed perfect credibility. **Kazuo Ueda** noted that the BOJ had provided forward guidance twice around 2000 and asked whether the presented paper was able to isolate the effect of the second forward guidance. **Wright** replied that the model of the paper could incorporate such an incremental effect.

B. On the International Spillovers of US Quantitative Easing[5]

Straub discussed the spillover effects of the Fed's QE policies on global asset prices and capital flows. One of the great features of the presented paper was its use of a meticulous dataset that covered 16,000 equity funds and 8,000 bond funds on a daily basis. Moreover, the paper not only analyzed the spillover effects on both prices and quantities but also distinguished the effects arising from policy operations and policy announcements. **Straub** presented five empirical results. First, the Fed's QE policies did have an influence on global asset prices, capital flows, and exchange rates. Second, the spillover effects of policy operations on asset prices and capital flows were larger than those of policy announcements. Third, QE1 (from November 2008 to June 2010) and QE2 (from November 2010 to June 2011) had differing impacts on capital flows; QE1 caused portfolio rebalancing from EMEs to the U.S. markets, while QE2 resulted in rebalancing both across countries (i.e., from the United States to EMEs) and across assets (i.e., from bonds to equities). Fourth, the Fed's QE policies increased procyclicality of capital flows into EMEs, although the policies were not the main drivers of the flows. Last, the impact of the Fed's QE policies was diversified among EMEs, in that the spillover effects were smaller in a country with a more active monetary policy and higher-quality institutions.

The discussant, **Kei-Mu Yi** (Federal Reserve Bank of Minneapolis), offered two comments. First, the methodology should be compared to other methodologies that used a data frequency shorter than one day. Although the main identification window was appropriate to capture the accumulated effects of the Fed's QE policies, the data included not only the effects of the policies but also noise arising from other shocks. Related, the effects of policy announcements might be underestimated so that such effects would be smaller than those of policy operations. The underestimation might arise because the dummy variable regarding policy announcements captured just the timing of the announcements but not quantitative information on the content of the announcements. Second, it was important to measure the effects of the QE policies on macroeconomic variables targeted by central banks, such as inflation and unemployment rates. Also, because each channel by which policy was transmitted to financial markets had potentially a different effect on the macroeconomic variables, each channel should be studied separately.

From the floor, **Wright** suggested that in the estimation, including some control variables that captured the actual monetary policy surprise would be better than just treating all of the announcements as an identical dummy variable. **Christopher J. Waller** (Federal Reserve Bank of St. Louis) argued that QE1 and QE2 had completely differing effects, because their policy objectives were completely distinct. **Straub** agreed that the aim of QE1 was to support the real side of the U.S. economy, whereas the aim of QE2 was to influence the nominal side to avoid deflation. **Choi** pointed to the possibility that the paper's results were biased, because the model failed to control the feedback effects from the real side of EMEs to the U.S. financial markets. He also suggested that it would be better to consider lingering effects of the global financial crisis to measure the effects of QE1 accurately, and to add control variables associated with

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5. For details, see Fratzscher, Lo Duca, and Straub (2015).

the European debt crisis to measure the effects of QE2 properly. **Eli Remolona** (Bank for International Settlements) agreed that the measured impact of QE2 contained noise originating from the European debt crisis. **Kazuo Ueda** stated that U.S. dollar appreciation during QE1 was caused by financial industries' deleveraging of dollar liabilities after the global financial crisis. As for the feature of the Fed's QE policies, **Kawai** asked whether the spillover effects of QE and QE tapering were symmetric or not. In addition, **Ito** commented that EMEs would have a variety of defense policies, depending on the differences in spillover effects, and asked how the spillover effects differed between the QE policies and conventional interest rate policy. **Straub** replied that according to related literature, the transmission of these two different policies would have differing implications for international environments. **Goodfriend** argued that the Fed's preference for discretion rather than rules-based policy made it difficult for both the U.S. markets and foreign markets alike to position themselves in advance of the Fed's monetary policy actions, but foreign markets less familiar with the Fed's inclinations and concerns exhibited greater distress in this regard. **Pornpinun Chantapacdepong** (Asian Development Bank Institute) proposed that it would be better to include, as explanatory variables, indicators of financial account openness, differences in the economic growth rate from the United States, and interest rate spreads on U.S. Treasuries.

C. Money Markets and Monetary Policy[6]

McAndrews talked about four tools for monetary policy conduct under a high level of reserves: the term deposit facility (TDF), overnight or term reverse repurchase agreements (RRPs), interest on excess reserves (IOER), and segregated balance accounts (SBAs). He began by presenting a theoretical analysis of the TDF and RRPs. The analysis focused on two frictions banks were facing: balance-sheet costs and interbank monitoring costs. Regarding the former, he indicated that RRPs could reduce banks' balance-sheet costs by decreasing their asset size, because their depositors could invest in RRPs by withdrawing deposits from banks. He also mentioned that the TDF did not affect banks' asset size or balance-sheet costs, as it was their deposit at the Fed. As for interbank monitoring costs, he pointed out that both RRPs and the TDF increased them by reducing reserves and that the effect of RRPs was weaker than that of the TDF because RRPs also reduced banks' asset size. Moreover, he argued that term RRPs were more effective for raising short-term interest rates under high reserve levels than the TDF, since banks' balance-sheet costs were dominant over their interbank monitoring costs.

A basic monetary policy tool under high reserve levels was IOER. The Fed devised IOER in October 2008 to form a floor for short-term interest rates. However, the rate of IOER had failed to serve as the floor. This had been caused by non-depositories, including government-sponsored enterprises (GSEs), as many had argued. **McAndrews** proposed SBAs—accounts segregated from the main accounts at the Fed—to push short-term interest rates closer to the rate of IOER.

The discussant, **Remolona**, first stressed that McAndrews' presentation made very

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6. For details, see Martin *et al.* (2015), Frost *et al.* (2015), and Garratt *et al.* (2015).

clear how the use of the aforementioned monetary policy tools was considered by the Fed to enhance its ability to influence money market rates in conditions of high reserve balances. **Remolona** then stepped back to place the discussion of monetary policy tools in a broader context and took them out of an "inside baseball" discussion. He pointed out that monetary policy had grown increasingly complicated near the ZLB; that is, only interest rate decisions had mattered in the past, whereas many issues regarding monetary policy tools had become important. He discussed other policy tools under high reserve levels adopted by other central banks, including the BOJ's complementary deposit facility. He also noted that when central banks found themselves at the ZLB and thus engaged in UMP, their treatment of transparency became asymmetric. Central banks tended to surprise the market when easing further but tended to be more transparent, especially in their use of forward guidance, when planning to tighten.

From the floor, **Goodfriend** cautioned that monetary policy itself should be clear to the public, referring to some of the arguments by McAndrews as "inside baseball." He also argued that to help push the federal funds rate up to the rate of IOER, the Fed should ask the U.S. Congress to allow the Fed to pay interest on overnight balances held by GSEs at the Fed, or else GSEs should be disallowed from holding balances at the Fed. **Anne Le Lorier** (Banque de France) pointed to the need for regulations on non-depository institutions, such as GSEs at the Fed, for interest rate control. In this context, **Goodfriend** noted that balance-sheet costs stemming from regulations were at risk of impeding arbitrage by banks. **Cecchetti** indicated that the risk of SBAs was that they could impair banks' intermediation function by providing cost-free riskless assets in money markets, and asked how large the amount of SBAs should be. **Choi** mentioned the large inflows toward the United States from the rest of the world. **Kazumasa Iwata** questioned whether the policy tools adopted currently by the Fed were sufficient to answer the increasing demand for safe international assets in the United States. In response to the questions raised, **McAndrews** emphasized the importance of providing places, such as the TDF and RRPs, for the increasing amount of international funds, since otherwise such funds might cause problems in other markets, including mutual funds. **Waller** argued that a single policy rate was desirable for clear communication between central banks and the public. **Momma** presented the idea that raising the rate of IOER would be a much simpler monetary policy tool under high reserve levels than other tools, including SBAs. **Berk** remarked that modification of reserve requirements was another monetary policy tool under high reserve levels. **Kenichirou Watanabe** (BOJ) pointed to the possibility that the scarcity of collateral impeded the competition in federal funds markets and thus caused short-term interest rates to deviate from the rate of IOER.

D. Maturity Structure and Supply Factors in Japanese Government Bond Markets[7]

Given the conduct of UMP, the effects of central banks' purchases of government bonds on long-term interest rates have gained increasing attention. **Fukunaga** presented an

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7. For details, see Fukunaga, Kato, and Koeda (2015).

empirical analysis on the effects of changes in the maturity structure and holders of Japanese government bonds (JGBs) on the term structure of interest rates and risk premia of long-term bonds, using a novel dataset on the amount outstanding of JGBs categorized by holder and remaining maturity. The results from both a regression approach and a term-structure model approach were consistent with the preferred-habitat theory: the net supply of JGBs, defined as the supply from the Japanese government minus the demand by preferred-habitat investors with preferences for bonds of particular maturities (namely, insurance companies, pension funds, and the BOJ), had significant effects on long-term interest rates. Based on the results, **Fukunaga** showed the degree to which the BOJ's JGB purchases, as part of QQE, had lowered term spreads as well as term premia.

The discussant, **Waller**, applauded the authors of the presented paper for their devoted efforts to conduct a thorough econometric analysis, and offered three comments from a theoretical viewpoint. The first was that there might be ways besides the preferred-habitat theory to consider how QE could affect interest rates across different assets, especially assets of different maturities with different collateral and liquidity properties. The second comment was that some preferred-habitat investors might exist merely because of regulations rather than because of their actual preferences for longer-term bonds. In this case, changes in regulations would have the same impact on interest rates as QQE in the framework of the presented paper. The third comment was that a central bank's purchases of private assets rather than public bonds might work differently.

From the floor, **McAndrews** suggested that, in relation to the third comment raised by Waller, it would be interesting to apply the presented model not only within government bond markets but also between government bond and other bond markets. **Fukunaga** replied that the suggested extension was possible, although the presented paper focused on the effects of a central bank's purchases of government bonds on long-term interest rates, because the aim of purchases of private assets by many central banks in advanced economies was mainly restoring the functioning of financial markets and intermediation rather than lowering long-term interest rates. **Hiroshi Ugai** (Hitotsubashi University) asked how they discerned the duration risk channel from the safety channel, considering the difference between the effect through altering the yield curve and permeating those of risky assets and that through changing the valuations of safety attributes of JGBs on economic welfare. One of the coauthors of the presented paper, **Naoya Kato** (BOJ), answered that portfolio rebalancing had occurred in Japan following the implementation of QQE, in that private entities had been increasing their holdings of risky assets while reducing their holdings of JGBs. In relation to the second comment by Waller, **Kazuo Ueda** asked whether the effect of the BOJ's JGB purchases from other preferred-habitat investors was neutral on interest rates. **Fukunaga** answered that it was neutral within the baseline specification of the presented paper but in general would not necessarily be neutral, because there might be some heterogeneity among preferred-habitat investors. **Goodfriend** asked about the difference between the effects of a central bank's outright purchases of bonds and a maturity swap without changing reserves. The remaining coauthor of the presented paper, **Junko Koeda** (Waseda University), answered that these two effects were almost the same, based on

the result of the term-structure model approach in the paper. **Goodfriend** also asked what the term premium in the model looked like. **Koeda** replied that the movement of the 10-year term premium was similar to that of the bond yields, because the expectation component of the yields had been stable at a low level. **Choi** commented that the net supply effect might change reflecting potential asymmetry in market liquidity.

E. A Model of Secular Stagnation[8]

The secular stagnation hypothesis, revived recently by Lawrence Summers, has attracted a great deal of attention for its consideration of slow economic recoveries following the recent global financial crisis. The main components of the recent thesis of secular stagnation were a permanently negative natural rate of interest and a binding constraint of the ZLB on nominal interest rates. **Mehrotra** presented a model for the recent thesis of secular stagnation. This model was a three-period overlapping-generations model in which the ZLB on the nominal interest rate was binding and long-run wage rigidity was present. He indicated that in the model a negative natural rate of interest could be generated by four factors: a deleveraging shock; a slowdown in population growth; an increase in income inequality; and a fall in the relative price of investment. He then stressed that the model could produce a secular stagnation phenomenon, such as weak aggregate demand and low rates of interest and inflation. He also pointed to implications of monetary and fiscal policies in the model. Forward guidance regarding the future path of the nominal interest rate had little stimulus effect on the economy, since the ZLB on the nominal interest rate was always binding. On the other hand, a sufficiently high inflation target was needed to avoid a permanent slump caused by a negative natural rate of interest. Regarding fiscal policy, he mentioned that the effects of permanent and temporary rises in public debt differed, and pointed out that a permanent rise in public debt might increase the real interest rate, but a temporary rise might not necessarily do so.

The discussant, **Dotsey**, praised the presented paper as a foundation for considering the recent thesis of secular stagnation in a very rigorous way. However, he questioned the validity of the model, especially in terms of the assumptions of a cashless setting and long-run wage rigidity, and raised three main issues. The first was that the absence of money in the model was crucial, because once money was introduced in the model the natural rate of interest could not be negative and hence a deflationary equilibrium failed to exist. The second issue was that wages were too high in a deflationary equilibrium in the presence of long-run wage rigidity. This did not match the data on the U.S. labor market, such as wages for new hires, wage growth, and real hourly earnings. Moreover, **Dotsey** stressed that in the United States, the United Kingdom, and Japan, there was no clear evidence for the secular stagnation phenomenon, even in terms of output growth. The third issue was that the secular stagnation phenomenon—such as weak aggregate demand and low rates of interest and inflation—could also be generated by recently developed dynamic stochastic general equilibrium (DSGE) models, even when the ZLB on nominal interest rates was not necessarily binding. This contrasted with the presented paper, where the ZLB was always binding. He then argued

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8. For details, see Eggertsson and Mehrotra (2015).

that such DSGE models were useful to investigate the effects of UMP measures, such as forward guidance, price-level targeting, and nominal GDP targeting.

From the floor, **Wright** mentioned that in the United States, according to long-run projections by the FOMC, Blue Chip, and the Congressional Budget Office, the expected rate of future output growth was around 2 percent, while the expected future interest rate was 4–5 percent, and that the former rate matched the secular stagnation hypothesis but the latter did not. He then asked why people in the United States had such an inconsistent view. **Ito** commented on a difference between the secular stagnation hypothesis and Japan's experience, where a deflationary equilibrium was more likely once downward nominal wage rigidity had been relaxed. **Choi** posed the question of what mechanism or policy tool could achieve a positive inflation target when the economy was close to the ZLB on nominal interest rates. **Straub** asked about the effects of asset purchase programs, which could not influence the natural interest rate but could affect term premia. It could be judged that monetary policy would still influence long-term interest rates through asset purchase programs, even in a model where forward guidance had little effect. **Waller** mentioned that several other constraints caused slow recoveries following the recent global financial crisis and that QE could play a significant role in such a situation. **Yi** commented that many countries grew rapidly following World War II, but as growth theory predicts, their capital accumulation growth rate eventually slowed down. In addition, population growth in these countries slowed; both forces could be part of a secular stagnation story without needing the assumption of the permanently binding ZLB constraint on nominal interest rates. **Berk** cautioned that it was problematic that the model included no financial sector, where fiscal policy could have no negative effect on risk premia. **Goodfriend** argued that low interest rates in advanced economies were caused by capital inflow from EMEs which were still subject to various institutional frictions. **Rzońca** mentioned that a sluggish recovery was most strongly related to low productivity rather than to insufficient demand.

V. The Mayekawa Lecture: Wall of Worries—Reflections on the Secular Stagnation Debate[9]

Eichengreen argued the secular stagnation hypothesis from historical vantage points. He began his lecture by presenting the (equilibrium) real interest rate calculated using an optimal economic growth model with standard values of model parameters and data on labor productivity growth. He then indicated that secular declines in real interest rates in advanced economies were not recent phenomena but had commenced in the 1980s.

Eichengreen argued that the real interest rate could be thought of as equating desired levels of saving and investment. He then introduced several factors that had an influence on the saving-investment (I-S) balance. As three factors affecting mainly the saving side of the balance, he noted (1) the so-called global savings glut, (2) an increase in income inequality, and (3) population aging. Regarding the first factor, he pointed out that in advanced economies the nominal ratio of investment to GDP would

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9. For details, see Eichengreen (2015).

not have increased even if the real interest rate had fallen significantly due to rapid growth in high-saving EMEs. As for the second and third factors, he stressed that there was little systematic empirical evidence for decisive links between them and the real interest rate. In light of these facts, he concluded that the three factors did not provide a compelling explanation for the observed decline in real interest rates and the observed low level of demand.

Regarding factors that influenced mainly the investment side of the I-S balance, **Eichengreen** cited (1) declining relative prices of investment goods and (2) fewer attractive investment opportunities. Regarding the former, he pointed to international evidence that countries with the lowest relative price of investment goods would have the highest ratios of investment to GDP. This evidence contrasted with the secular stagnation thesis that a decline in the relative price of investment goods reduced the nominal ratio of investment to GDP because the quantity of investment did not increase in accordance with the drop in the relative price.

Concerning the latter factor, Eichengreen cast doubt on the hypothesis that the contribution of recent technological innovations to total factor productivity (TFP) growth was smaller than that of past innovations, because the latest innovation was less profitable and harder to commercialize than past innovations. In this regard, he mentioned that advanced economies had the capacity to effectively apply and commercialize information technology (IT) in terms of finance, entrepreneurship, coordination between basic and applied research, and so forth.

Eichengreen then cited three historical examples of innovation waves: (1) steam and rail in the 19th century; (2) electricity, the internal combustion engine, and indoor plumbing from the late 19th through the mid-20th century; and (3) IT, such as computers, cellphones, and the web, since the 1960s. He argued that there was a lag between innovation and TFP growth when new products and processes had network characteristics requiring rearrangement of a wide range of distinct activities before the effects of investment for innovation began to materialize. He also indicated that it was not unprecedented for three decades of incremental innovation, standardization, and adaption to pass before the effects on efficiency began to boost TFP. Based on these observations, he closed his lecture with the remark that the IT revolution had taken a decade-long pause between 2005 and 2015, but this fact might be less a portent of secular stagnation than a harbinger of better times to come.

From the floor, **Goodfriend** argued for the importance of property rights and other impediments that might depress investment. **Eichengreen** replied that it might be an open question whether there had been a visible decline in the security of property rights and how this point was linked to secular stagnation. **Cecchetti** asked whether low real interest rates were compatible with deficient aggregate demand over the long run. **Eichengreen** highlighted his concerns about the investment side of the I-S balance rather than the saving side. **Cecchetti** also asked how properly we could measure prices with quality adjustment. **Le Lorier** questioned how we could measure an intangible contribution to well-being. In response to their comments, **Eichengreen** acknowledged difficulties in measuring real interest rates and prices of investment goods. He also noted that there was no obvious trend in the relative price of investment goods before 1950, but there had been a clear downward trend thereafter. **Momma** indicated

that income inequality might be still a good candidate for over-saving, because weak income generation by middle-class households might make scaling up innovation less profitable and therefore lead to depressed levels of investment. The session chair, **Choi**, pointed out that it would be important to create a new industry to meet the potential demand of the elderly in an aging economy. **Kuroda** argued that it would be difficult to predict any long-term trend in the future from the past experiences in the first two innovation waves mentioned by Eichengreen, because these two waves were quite different from the recent third innovation wave.

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APPENDIX 1: PROGRAM

Thursday, June 4, 2015

Morning
  Opening Session
    Chairperson: **Kenichirou Watanabe**, Bank of Japan
    Opening Remarks: **Haruhiko Kuroda**, Bank of Japan

  Session 1: Forward Guidance and Asset Prices
    Chairperson: **Mehmet Yörükoğlu**, Central Bank of the Republic of Turkey
    Paper Presenter: **Jonathan H. Wright**, Johns Hopkins University
    Discussant: **Jan Marc Berk**, De Nederlandsche Bank

  Session 2: On the International Spillovers of US Quantitative Easing
    Chairperson: **Kazuo Momma**, Bank of Japan
    Paper Presenter: **Roland Straub**, European Central Bank
    Discussant: **Kei-Mu Yi**, Federal Reserve Bank of Minneapolis

  Session 3: Money Markets and Monetary Policy
    Chairperson: **Anne Le Lorier**, Banque de France
    Paper Presenter: **James J. McAndrews**, Federal Reserve Bank of New York
    Discussant: **Eli Remolona**, Bank for International Settlements

Afternoon
  Policy Panel Discussion
    Moderator: **Takatoshi Ito**, Columbia University
                         National Graduate Institute for Policy Studies
    Panelists: **Stephen G. Cecchetti**, Brandeis International Business School
                         Marvin Goodfriend, Carnegie Mellon University
                         Ravi Menon, Monetary Authority of Singapore
                         Hiroshi Nakaso, Bank of Japan
                         Lucas Papademos, Bank of Greece

Morning

    Session 4: Maturity Structure and Supply Factors in Japanese Government Bond Markets

Chairperson:	**Kazuo Ueda**, University of Tokyo
Paper Presenter:	**Ichiro Fukunaga**, Bank of Japan
Discussant:	**Christopher J. Waller**, Federal Reserve Bank of St. Louis

    Session 5: A Model of Secular Stagnation

Chairperson:	**Jean-Luc Schneider**, Organisation for Economic Co-operation and Development
Paper Presenter:	**Neil R. Mehrotra**, Brown University
Discussant:	**Michael Dotsey**, Federal Reserve Bank of Philadelphia

    Mayekawa Lecture

Chairperson:	**Woon Gyu Choi**, Bank of Korea
Lecturer:	**Barry Eichengreen**, University of California at Berkeley

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Juda Agung	Bank Indonesia
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Hanna Armelius	Sveriges Riksbank
Suat Aydin	Central Bank of the Republic of Turkey
Jan Marc Berk	De Nederlandsche Bank
Adam Cagliarini	Reserve Bank of Australia
Stephen G. Cecchetti	Brandeis International Business School
Pornpinun Chantapacdepong	Asian Development Bank Institute
Lillian Cheung	Hong Kong Monetary Authority
Daniel Chiquiar	Banco de México
Woon Gyu Choi	Bank of Korea
Angelo Alfonso Alberto Cicogna	Banca d'Italia
Francisco Jr. Garcia Dakila	Bangko Sentral ng Pilipinas
Michael Dotsey	Federal Reserve Bank of Philadelphia
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Norhana Endut	Central Bank of Malaysia
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Hiroshi Fujiki	Chuo University
Ichiro Fukunaga	Bank of Japan
Marvin Goodfriend	Carnegie Mellon University
Yutaka Harada	Bank of Japan
Hisashi Harui	Kwansei Gakuin University
Hideo Hayakawa	Fujitsu Research Institute
Yuzo Honda	Kansai University
Daisuke Ikeda	Bank of Japan
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Yukinobu Kitamura	Hitotsubashi University
Takahide Kiuchi	Bank of Japan
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