

CIRJE-F-885

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Is It a Case of Self-Fulfilling Expectations?**

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April 2013

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March 2013  
1<sup>st</sup> Draft  
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**The Response of Asset Prices to Abenomics:  
Is It a Case of Self-Fulfilling Expectations?\***

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**Summary**

**Japan's Prime Minister, Shinzo Abe, has declared the adoption of a policy package that assigns a key role for aggressive monetary easing by the Bank of Japan—the so-called Abenomics. Since the announcement, the yen has weakened against the dollar by 25% and Nikkei 225 has risen by 40%. In this paper I discuss the backgrounds for such large asset price response. I base the discussion on the theory and empirical analysis of non-conventional monetary policy measures that have been carried out by major central banks so far.**

**I argue that a non-negligible portion of the asset price response seems based on investors' excess optimism concerning the effectiveness of non-conventional monetary policy to stimulate the economy and raise prices. In that sense, there is a good chance that asset prices may go back to previous levels. But I also point out that given that expectations have changed so much, they have a chance of raising inflation to the target rate of 2%, in which case they will have become self-fulfilling.**

\*prepared for an AEPR conference, April 6, 2013, Tokyo.

Asset prices have responded in a surprising way to the announcement of a policy package in late 2012 by Shinzo Abe, then the Prime Minister of the LDP. The package (henceforth, Abenomics) has placed a central focus on aggressive monetary easing. The yen has weakened by about 20% against the dollar since then. Japan's stock market has gone up by about 30%. I offer a tentative evaluation of Abenomics in the light of the experience with non-conventional monetary policy (NCM) by major central banks including the Bank of Japan (BOJ).

Abenomics seems to rest on a simple premise. If inflation expectations rose, it should stimulate asset prices, which will in turn raise aggregate demand for goods and services. Inflation will therefore rise and the initial expectations will be realized. Hence, why don't we change expectations by promising aggressive monetary easing?

This argument is similar to the Krugman-Woodford theory of forward guidance. They argued that traditional monetary policy, including expansion of base money, loses traction at the zero lower bound on interest rate (ZLB), but that a central bank can still stimulate the economy by promising to be inflationary once the economy gets out of the ZLB. This promise of unnecessary easing will change inflationary expectations and the rest will follow. Krugman (1998) proposed to set a 4% inflation target for 10 years to change expectations.<sup>1</sup> Or, he argued that "a central bank needs to be credibly irresponsible."

Abenomics is on a less intellectually solid basis. It does not contain an explicit reference to an abnormally high inflation target. In fact, Abe has imposed on the BOJ only a 2% inflation target. There has been no in-depth discussion of what the BOJ will be able to do from here. Abenomics just seems to assume that if the BOJ tried hard enough, it should be able to raise inflation. Despite this, investor expectations have responded. Perhaps, Abe's unprecedented pressure on the BOJ to ease has convinced the market that the BOJ would become credibly irresponsible in one way or another. If in fact NCM to be carried out by the BOJ in the near future is powerful enough to raise inflation to 2%, investors' response to Abenomics has been rational. If not, asset prices may go back to previous levels. There is, however, a third possibility, that is, asset price changes taken place already

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<sup>1</sup> See also Woodford (1999).

will generate a virtuous cycle of further changes in asset prices and improvements in the economy. In this case, investor expectations, which were non-rational at the beginning, will become self-fulfilling.

In order to discuss which one of these interpretations is the most plausible, I devote most of the paper to the discussion of the past experience of central banks with NCM, especially, that of the BOJ. I start by offering a typology of NCM that includes a brief discussion of the theoretical rationale for each measure as well. I then carry out a new event analysis type regression analysis on the effectiveness of the Fed's and the BOJ's NCM. They show that not too many NCM measures have affected asset prices significantly, but it also confirms that Abenomics has affected them. In the light of the results I consider the question of why the BOJ has failed to stop deflation so far. I finally offer some informal discussions about the effectiveness of Abenomics. I argue that at least part of the market's response to Abenomics is based on the market's illusion about the effectiveness of NCM. This illusion seems to come from the market's inability to distinguish between some essential differences of various types of NCM. The paper's discussion is mostly confined to the relationship between asset prices and NCM. The relationship between the real economy and NCM will be only informally discussed.

### *1, A Typology of Nonconventional Monetary Policy Measures*

Let me start by defining the terminology used throughout the paper.<sup>2</sup> NCM central banks have adopted can be classified into “large scale asset purchases”, “quantitative easing” and “forward guidance of interest rates and or future asset purchases.” Large scale asset purchases, in turn, consist of those in distressed markets and in more normal markets. The term “large-scale asset purchases” is usually used when the central bank is concerned with what type of assets are purchased, while “quantitative easing” is used when the bank is only concerned with the size of its balance sheet. Large scale asset purchases have in many cases been accompanied by quantitative easing, but not always. As will become clear, the theoretical justification of NCM is not as logically tight as is sometimes assumed.

Large-scale asset purchases have occurred in many forms. The theoretical rationale for such actions seems to rest on the existence of

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<sup>2</sup> This section draws heavily on Ueda (2012c).

market imperfections. During a financial crisis, a sharp decline in investors' ability to take risks reduces market liquidity in certain segments of the financial system. In such markets, central bank purchases of assets can lower liquidity/risk premiums and in this way support the economy (Type 1 Large Scale Asset Purchases: LSAP1). Allen and Gale (2007), Curdia and Woodford (2010), Gertler and Karadi (2012) discuss the usefulness of such operations, which are sometimes called "credit easing." In addition to security markets, interbank markets can become dysfunctional due to heightened counterparty risks, especially in term markets. In such a case central banks can make term loans in order to contain risk premiums. Such operations may also be regarded as credit easing.

Other types of large-scale asset purchases by central banks are purchases of Treasury bonds or private financial instruments in more normal conditions (Type 2 Large Scale Asset Purchases: LSAP2). For example, many central banks have purchased long-term government bonds and expanded their balance sheets. Such an operation can be decomposed into pure quantitative easing (to be discussed below) and a so-called "operations twist," which is a form of LSAP2, involving the central bank purchases of long-term Treasury bonds while at the same time selling short-term Treasury bills. Thus, LSAP2 may or may not be accompanied by pure quantitative easing. The operations twist part of the measure affects the yield curve if investors in such securities are segmented or have "preferred habitats." The effects could spill over into other markets such as the corporate bond market through portfolio rebalancing effects. Whether such "market imperfections" exist has long been debated with no clear cut conclusion.

Some have argued that irrespective of what a central bank buys, an expansion of the central bank balance sheet generates an easing effect by itself. An example would be central bank purchases of Treasury bills, a plain vanilla instrument, in order to supply liquidity beyond the level required for a zero percent policy rate. In the following let me call such attempts "pure quantitative easing (QE0)" in order to distinguish them from quantitative easing that accompanies large scale asset purchases. At a zero interest rate, however, the economy is largely satiated with liquidity. Hence, it is not clear why attempts to add still more liquidity will produce any significant results. Of course, it would be a different story if the central

bank was financing government purchases of goods and services—a helicopter drop of money. Consequently, many researchers now consider it more important what types of assets central banks purchase in their pursuit of nonconventional policies, rather than the size of their balance sheet increases per se.

An entirely different form of unconventional monetary easing is *forward guidance*—providing assurance to the market that the key policy interest rate, like the call market rate, will be lower in the future than currently expected. To affect market expectations of future short rates, the central bank needs to commit to monetary easing even after the economy no longer requires it. This promise of unnecessary future easing creates an expectation of rising inflation. As a result, the current market interest rates will be lowered up to a certain maturity, but raised beyond that maturity if inflation expectations rise. Bauer (2012) argues that large-scale asset purchases, by sending the signal that the central bank will continue to be aggressive in monetary easing in the future, also entail an element of forward guidance—a signaling effect. Recently, the Federal Reserve has used the forward guidance strategy for its asset purchases as well. A serious problem with the forward guidance strategy is that it is not time consistent, that is, there is an incentive on the part of the central bank to renege on its promise once inflation comes back to normal levels.

In addition to the caveats mentioned, the underlying logic of how NCM measures work suggests certain limits on what they can be expected to achieve. LSAP1—that is, operations in temporarily dysfunctional markets—should come to an end once the markets have adjusted. Forward guidance of interest rates is an attempt to narrow long–short interest rate spreads up to a certain maturity. LSAP2, asset purchases in more normal markets, may reduce risk premiums. But there are likely to be limits to the extent of the fall in interest rate spreads or risk premiums. Also, as the size of such operations becomes very large, one has to start worrying about distortions generated by direct central bank involvement in financial intermediation.

Table 1 illustrates some of the typical nonconventional measures adopted by the BOJ, the Fed and the ECB. Detailed explanation of these measures can be found in Ueda (2012a, b). Let me here point out that the central banks employed LSAP1 extensively during the acute phase of

financial crises, that is, during the late 1990s to early 2000s in Japan and 2008-09 in all three areas. The ECB, with its problems in the government bond market of Southern European countries, is still relying heavily on LSAP1. As financial stresses abated, the BOJ and the Fed have turned to the use of LSAP2 measures. Forward guidance was first used by the BOJ in 1999 and subsequently by the Fed in 2003. Both central banks have used the strategy in various forms since then. QE0 has been tried by only the BOJ. The BOJ has also embarked on extreme measures such as purchases of equities. Let us now turn to the analysis of the effectiveness of such measures.

## *2, Evidence on the Effectiveness of Nonconventional Monetary Policy Measures*

A balanced reading of existing empirical researches on the effectiveness of NCM suggests the following.<sup>3</sup> Both LSAPs and forward guidance have had some effects on asset prices. Among LSAPs, LSAP1 clearly stabilized financial markets at the height of financial crises. The effectiveness of LSAP2 is less clear. Although many LSAP2 measures moved asset prices in the expected directions, whether they had long-lasting effects are unclear. Also, some of the movements in asset prices seem to have been a response to other variables such as improvements in the real economy. Even when the effects of policy measures on asset prices are detectable, the transmission mechanism remains unclear. This is because many researches use the news analysis. In contrast to the abundance of research on the relationship between asset prices and NCM, research on the effects of NCM on the economy is scarce. Very few seem to have found solid evidence of the effects of QE0 on asset prices or the economy.

### *A News Analysis on the BOJ's NCM*

In the following, I would like to supplement and update some of

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<sup>3</sup> See, for example, Ueda (2012a,b). Bernanke (2012) summarizes the existing research on the Federal Reserve's NCM by saying that both balance sheet tools (LSAPs) and communication tools (forward guidance) have significant effects on asset prices and supported economic recovery while mitigating deflationary risks.

these analyses by using a variant of the news approach on the Japanese and U.S. data. Given my finding (Ueda 2012b) that the effects of NCM on asset prices become weaker once other determinants of asset prices are taken into account, I run simple regressions for asset prices with monetary policy dummies, controlling for the effects of other relevant variables. Since findings of significant monetary policy effects on asset prices lasting only a day or two are of little practical importance, I carry out regressions using monthly data.<sup>4</sup>

The specification of the equations estimated is a simple one. The dependent variables are the monthly rate of change in asset prices except for interest rates for which it is a simple first difference. The independent variables are non-conventional monetary policy dummies and other variables available at the monthly frequency that may affect asset prices. More specifically, the equations for Japan include monetary policy dummies, the overnight call market rate, the Shokou Chukin business sentiment index, S&P 500, the 10 year US Treasury bond yield, the JP Morgan global Purchasing Managers Index for Manufacturing, the number of initial unemployment insurance claims in the U.S. and the Euro-dollar exchange rate. The foreign variables are meant to capture changes in global economic conditions that affect Japan's asset prices. The assumption here is that they are exogenous variables in the equations estimated. The estimation period is April 1998, right after the BOJ was made more independent, through January 2013.

Table 2 shows the estimation results. The first column identifies the monetary policy measures. The second column shows categorization based on the typology of the last section. The shaded cells in the remaining columns indicate the significance of corresponding monetary policy dummies at least at the 90% level. The monetary policy dummies do not exhaust all the policy measures adopted during the sample period, but include all those that were found significant in a similar analysis of daily data in Ueda (2012b). Each policy dummy is assumed to take the value of one for two months starting in the month when the measure is introduced. This reflects the judgment that some measures affected asset prices for

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<sup>4</sup> Ueda (2012b) carried out a news analysis using daily data. There is an obvious tradeoff between more clear-cut results available from the analysis of daily data and more important results available from low frequency data.



more than a month, for example, the Abenomics dummy. Because it is almost impossible to determine the duration of policy effects for each measure, it is assumed that all the measures affect asset prices for two months.<sup>5</sup>

The results are not very different from Ueda (2012b). Thus, the forward guidance measures affected the interest rate or the exchange rate. The introduction of QE affected both the stock price index and the exchange rate. However, increases in the current account balance target in the early to mid-2000s had almost no effects on asset prices except for that announced in December 2001. This measure, which was accompanied by increased purchases of JGBs, affected the exchange rate. None of the increases in the target amount of the current account balances without increases in JGB purchases, QE0 type measures, are significant. During 2008-2010, other than the forward guidance measure, only the introduction of CMP in October 2010, a LSAP2 type measure, affected the asset prices.<sup>6</sup>

A noteworthy result of the table is the significance of the two 2012 monetary policy dummies. The February announcement to carry out monetary policy more aggressively affected the yen and the Prime Minister Abe's pressure on the BOJ to ease policy more aggressively affected the exchange rate and TOPIX.<sup>7</sup> The result is important because the regressions control for improvements in global economic conditions and investor sentiments. Coefficient estimates indicate that the February announcement explains 48% of the change in the yen, while the Abe dummy, 38% of the exchange rate change and 52% of the rise in TOPIX.

Relegating the interpretation of this result to section 4 below, in the

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<sup>5</sup> Estimation with dummies taking one only for a month was also conducted. The results were broadly similar to the two month case reported here, though the number of significant dummies increased slightly. Or else, the duration of policy effects can be estimated in principle. This was, however, practically difficult given a number of overlaps between policy measures when each is assumed duration of two months.

<sup>6</sup> In addition, the May 2003 dummy was significant in the TOPIX equation, but was also significant with a wrong sign in the interest rate equation. With high likelihood, the dummy is picking up the effects of the government's decision on May 17, 2003 to de facto nationalize Risona Bank. In fact, use of daily data revealed no such significant effects of the dummy (Ueda (2012b)). Thus, I have decided not to mark the corresponding cells in Table 2.

<sup>7</sup> The February 2012 dummy was also close to being significant in the TOPIX equation with a t-value of about 1.5.

remainder of this section I would like to discuss informally the two episodes where investor expectations seem to have responded significantly to NCM measures. This discussion provides some interesting insights for evaluating Abenomics.

The first is the introduction of forward guidance in April 1999 for the first time. The announcement of the measure generated a significant downward shift of the term structure of interest rates. Thus, 30 days after the announcement, 2 year, 5 year and 10 year JGB rates were down by 13.6, 20.9 and 22.7 basis points, respectively. (Ueda (2012b)). This was the first successful use of forward guidance to affect interest rates. In a sense, however, the strategy was only half successful because it failed to raise inflation expectations. Had inflationary expectations developed, the yield curve would have become steeper beyond a certain maturity. Nonetheless, the economy started to recover and the BOJ exited from the forward guidance strategy in August 2000 despite a core core CPI inflation rate of -0.5%. The economy went into a recession again in 2001 due in large part to the burst of the IT bubble and the resultant global recession.

The second BOJ's NCM measure that affected expectations significantly was quantitative easing introduced in March 2001. This was a combination of QE0, setting a target on the current account balances, LSAP2, purchases of JGBs to hit the current account balances, and forward guidance, the promise of continuation of the framework until inflation became stably positive. The BOJ also carried out many LSAP1 type operations given the lingering stress in the financial system. In any case, the announcement of quantitative easing exerted significant effects on investor expectations. TOPIX rose by 20.3% within about a month. Interest rates declined on impact, but started to go up on the third business day. For example, the 10 year JGB rate rose by 35 bps by the middle of April.<sup>8</sup> This is shown in Figure 1. This seems to have been a clear example of NCM generating inflation expectations and the rise in asset prices. Let me hasten to add that it is not easy to determine which component of quantitative easing led to a rise in inflation expectations.

The response of the asset prices, however, was short-lived. As it

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<sup>8</sup> In the regression the dummy was not significant in the interest rate equation. This is due to the assumption that dummies' effects last for two months. Figure 1 shows that the 10 year JGB yield already started to decline in the second half of April 2001.

became clear that the economy failed to improve on the asset price movements, both stock prices and long-term interest rates went back to previous levels, as is also shown in Figure 1. Although the target amount of the current account balances was raised a number of times after that, asset prices hardly responded, as we saw in Table 2. Rebounds in asset prices had to wait until improvements in foreign economies and the recapitalization of several large banks such as Risona.

These experiences show that investor expectations do occasionally respond to NCM measures, but sustaining them and raising inflation significantly have not been an easy task.

### The Soros Chart

In passing it would be interesting to check the validity of the so-called Soros Chart, i.e., the relationship between the exchange rate and relative money supplies. The relationship is an empirical one entertained among some investors, especially, in the foreign exchange market. The analysis of the relationship serves as a further test of the effectiveness of QE0 type monetary policy measures.

The first row of Table 3 shows the same exchange rate equation as in Table 2 with the US-Japan relative base money term included, but with the effects of the monetary policy dummies suppressed for the sake of brevity. The relative base money term is significant with the right sign. Thus, an expansion of base money relative to that of the foreign economy seems to stimulate the economy by generating a weaker currency. The second row of the table, however, breaks relative base money into Japanese and U.S. base money. It shows that what matters is only U.S. base money.

Figure 2, the scattered diagram of the rate of change in the exchange rate and US base money, shows what is going on very clearly. The positive correlation between the yen-dollar rate and US base money relies on just a handful of observations from late 2008 and early 2009, that is the period right after the failure of Lehman Brothers. Table 3, in rows three and four, shows that once six observations are excluded from this period neither relative base money nor US base money is significant.

The period in question was when investors dumped the U.S. dollar at the outbreak of the serious financial crisis in the U.S., while the Fed supplied liquidity massively in order to contain the serious stresses in the

financial system. The U.S. monetary base more than doubled between August 2008 and April 2009. The increase, however, was clearly due to various LSAP1 measures. The sharp depreciation of the dollar was also entirely different in character from what might ensue from a LSAP2 type easing of monetary policy.

Such an analysis seems to cast a serious doubt as to some investors' ability to distinguish between different types of NCM.

### *The Effectiveness of the Fed's NCM*

Next, Table 4 presents a similar set of results for the Fed. The dependent variables are the 10 year US Treasury yield, S&P 500 and the Euro-Dollar exchange rate. As independent variables, I include the federal funds rate, the number of initial unemployment claims, JP Morgan global manufacturing PMI and the spread between German and Spanish 10 year government bond yields. The European bond yield spread is meant to capture the effects of the Euro crisis on the US asset prices.<sup>9</sup> The variables are monthly changes. Since many policy measures were adopted within a short span of time, the policy dummies are assumed to be of one month duration rather than two in the Japanese case. One exception is the QE2 dummy for which the value of one is assigned from August 2010 to November 2010 in view of the early references to the measure by the Federal Reserve Chairman Bernanke.<sup>10</sup> The period of estimation is from June 2007, right before the outbreak of the financial crisis, to January 2013.

The table shows that very few of the Fed's policy measures exerted significant effects on the asset prices. The LSAP1 type measures, that is, the Fed's QE1 measures adopted during late 2008 to early 2010 had the effect of lowering the long-term interest rate, raising stock prices and, the December 2008 measure, weakening the dollar. None of the other measures, however, had any significant effect on asset prices with the exception of the strengthening of forward guidance in August 2011, which lowered the interest rate.<sup>11</sup> For example, the S&P 500 index rose significantly around

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<sup>9</sup> The German-Spanish spread was insignificant in any of the Japanese asset price equations. The variable seems to have affected Japanese asset prices through global asset prices.

<sup>10</sup> The results, however, were little changed with alternative assumptions about the length of the QE2 dummy.

<sup>11</sup> This dummy, however, had significant negative effect on the stock price index. Thus,

the time of the introduction of QE2. The regression result indicates that this rise in stock prices is mostly explained by an improvement in the economy, that is, declines in initial unemployment claims. The result is consistent with what I found earlier with weekly data for the U.S. (See Ueda (2012b).)

Needless to say, the simple regression analysis offered above has a number of limitations. Instead of carrying out further analyses that remedy such limitations, let me offer one informal remark about the effects of the Fed's NCM on interest rates during the years 2011-13.

Figure 3 shows the 10 year government bond yield minus (ex energy-food) CPI inflation over year earlier for Japan and the U.S. The U.S. real interest rate has been in negative territory since the end of 2011, while nothing like this has happened in Japan with the exception of early 1998 when an increase in the consumption tax rate brought about a temporary rise in inflation. The backgrounds for the recent decline in the U.S. real interest rate can be seen in Figure 4, which shows both the nominal interest rate and inflation along with the stock price index. Inflation started to rebound from a low in October 2010, presumably in response to many policy measures taken before such as QE1 and bank recapitalization. Despite this, the nominal interest rate kept falling until the middle of 2012, which resulted in a sharp fall in the real interest rate as in Figure 3. Since the mid-2011, many forward guidance and LSAP2 measures have been adopted as shown in Table 4. Although only the forward guidance measure announced in August 2011 is significant in the table, there is the possibility that other attempts to strengthen forward guidance and/or LSAP2 measures helped to contain the rise in the nominal interest rate in the face of rising inflation.<sup>12</sup> The significant fall in the real interest rate seems to have been a factor behind the sharp rise in U.S. stock prices since late 2011.

The BOJ's forward guidance or LSAP2 has never got to this stage

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the dummy can be picking up the effects of factors other than monetary policy such as the discussion on the U.S. debt ceiling issue or revision of US GDP data for the first quarter of 2011. Swanson & Williams (2012) report significant effects of this policy measure on interest rates along with the January 2012 measure, which in our case was insignificant.

<sup>12</sup> For example, the Fed's purchases of Treasuries and/or progressive strengthening of forward guidance may have indeed contained possible increases in nominal interest rates when inflation rose. To the extent that the rise in inflation does not coincide with the adoption of NCM measures, however, regressions such as those in Table 4 do not seem to capture such effects adequately.

either because of too early termination of the NCM or the entrenched nature of inflation expectations.

To sum up the experience with NCM by the BOJ and the Fed, LSAP1 was very effective during the height of financial crises. Other NCM measures tend to exert strong effects on asset prices either when they signal a change in the monetary policy framework, as was the case with the introduction of forward guidance and quantitative easing in Japan or when they are used to contain increases in interest rates despite a strong upturn in the economy as in the U.S. during 2011-13. On the other hand, increased usage of QE0 type measures (Japan:2001-03) or increases in asset purchases (Japan:2010-2011) in response to a weaker economy have not been very successful.

### *3, On the BOJ's failure to stop deflation*

Whatever the effectiveness of the BOJ's NCM has been, the BOJ has failed to stop a deflation of at most 1%. Why? First, as the above analysis suggests, not too many NCM measures affected even asset prices, that is, were not very effective. This, however, raises the question of why the U.S. and Euro zone have avoided deflation so far. The most important reason seems to be that Japan let deflationary expectations become entrenched by acting slowly on its banking problems in the 1990s, while the U.S. especially, acted swiftly to recapitalize banks in 2008 and carry out many LSAP1 measures. When the BOJ started its first forward guidance strategy in early 1999, inflation was already in negative territory.

Exogenous and institutional factors have been different. The population started to decline in Japan in the 2000s, which added to the stagnant behavior of aggregate demand for goods and services. Downward rigidity of wages in the U.S. and Europe may have been a reason for the absence of deflation in the two economies so far. In contrast, wages fell fairly quickly in Japan in the late 1990s as the economy stagnated.<sup>13</sup> Once deflation has become a reality, there has been puzzling absence of the response of inflation to improvements in the economy.<sup>14</sup>

The response of foreign central banks to the Great Recession acted as

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<sup>13</sup> See Kimura & Ueda (2000) for the analysis of downward wage flexibility in Japan.

<sup>14</sup> This is the worldwide phenomenon of a flat Phillips curve. In Japan's case, however, the degree of flatness has been extreme.

a negative shock to Japan as well. Post Lehman failure, real interest rates declined in most major economies to near zero levels, except for Japan. Figure 3 showed this for the U.S. But it is also the case in the U.K. and Germany. This was a result of a swift return to normal inflation rates from lows recorded in 2010 on the one hand, and NCM that lowered bond yields except for Germany. In Japan's case, however, inflation continued to stay in the negative territory; nominal government bond yields were already very low. The resultant relative increase in the real interest rate made Japan a loser in "the currency war."

The BOJ itself, however, needs to be blamed for the weak effects of NCM on the economy. A clear example is two too early exits from the forward guidance strategy, one in August 2000 and, the other, in March 2006. In both cases the (ex energy-food) component of CPI was still falling at the time of exit despite the promise of the continuation of a zero rate until "deflationary concerns are dispelled," or "inflation is stably above zero." Such decisions seem to have generated investors' doubts about the BOJ's resolve to fight deflation and weakened the power of subsequent NCM to stimulate the economy.

In late year 2000, after the rate hike in August, the BOJ internally held a series of meetings to discuss the appropriate "target" rate of inflation. The meetings did not result in a clear cut target because one group argued for a small positive inflation rate while another for a zero inflation rate (BOJ (2000)). The rate hike decision in August could not have been justifiable if the target was a positive rate.

Another problem with the BOJ's NCM may have been its reluctance to buy JGBs on a large scale. Thus, in early years of NCM, 1998-2000, the BOJ did not increase its monthly purchases at all. The amount of purchases was increased during 2001-03, but not afterwards until 2008. The BOJ's LSAP2 program, CMP, has placed restrictions on the duration of JGBs the Bank purchases under the program. All this has stemmed from the Bank's determination "not to underwrite the government's budget deficits," but may have weakened the effectiveness of the Bank's purchases of JGBs by limiting the duration of the bonds bought. The contribution of this factor, however, is difficult to gauge given that rates have been very low since the late 1990s across the yield curve.

#### 4, *The significance of the Abe dummy*

As discussed in section 2, the yen and Japan's stock prices responded significantly to Abenomics. This is in contrast to the muted response of asset prices to many, if not all, NCM measures adopted up to 2011. What explains the difference?

The foregoing discussion suggests a proximate cause of the large response to Abenomics: the possibility of a change in the BOJ's image as a weak deflation fighter built up over the years. This explanation also fits with the significance of the February 2012 dummy in the Table 2 regressions. At that time the Noda administration was also putting huge pressure on the BOJ to ease aggressively, extracting a statement from the BOJ that the Bank would carry out "powerful monetary easing" in order to achieve the price stability goal of 1%. In both cases extraordinary pressure from the government on the BOJ generated the market's expectation that the BOJ would become more serious at its fight against deflation.

At this point, it is interesting to note that the JGB market, dominated by domestic investors, has shown a different type of response to Abenomics. JGB yields have declined in anticipation of further purchases of JGBs, rather than going up on higher inflation expectations. Breakeven inflation rates inferred from inflation indexed bonds have risen; but this market has suffered from a sharp fall in liquidity since around the Lehman event. One possible interpretation of all these asset price movements is that investors are fairly confident about NCMs ability to affect asset prices, but not inflation.

In either case, the obvious next question is whether the BOJ would be able to sustain the rise in asset prices or raise inflation significantly if it became more serious at doing so. It is probably fair to say that, after a series of attempts at NCM for 15 years, no intrinsically new measures are left for the BOJ to employ. The BOJ would very likely be doing more of what has been already tried. For example, the BOJ can buy JGBs more aggressively. But with 10 year JGB yield already at below 0.7% it is unclear how significant the effects of such purchases on asset prices or the economy will be. The size of the BOJ balance sheet can be expanded significantly, but the effectiveness of such QE0 type measures is very questionable, as discussed.



Thus, there is a significant chance that the market has had illusions about what the BOJ will be able to deliver in the near future. Popular discussion of the effects of NCM on the economy appears to be very much confused because NCM is much more complicated than is monetary policy carried out through changes in the policy rate.

The market and/or pundits of monetary policy have had some specific reasons for confusion as well. The popular view that less aggressive monetary expansion by the BOJ than that of the Fed during 2008-09 produced a sharp yen appreciation is based on the same confusion as the Soros chart discussed in section 2. The truth is that the serious U.S. financial crisis at the time (initially) weakened the dollar sharply on the one hand, and, on the other, forced the Fed to carry out LSAP1 on an unprecedented scale. The BOJ had to do less of LSAP1 given that Japan was not the epicenter of the crisis.

In the summer of 2012, the ECB president Draghi made the famous remark that “the Bank will do whatever it takes to defend the Euro,” and announced the OMT program to stabilize European government bond market. This has had a remarkable impact of stabilizing the market despite no activation yet of the program so far. The success of the ECB intensified the feeling among investors that the BOJ should do “whatever it takes to stop deflation” and would succeed if the Bank were bold enough. The problems two banks are addressing, however, are entirely different. Europe’s problem is government bond market in distress. Thus, the ECB has been employing LSAP1 measures, which are in many cases effective. The BOJ, faced with deflation, will have to use LSAP2, forward guidance and possibly other measures, whose effectiveness is unclear. The market is again not seeing essential differences between different types of NCM.

Another related confusion can be illustrated by the following remark. “In principle, the BOJ can use its fiat money to buy everything in the world, at any price it wanted. This would certainly lower the purchasing power of the yen.” (Wolf (2013).) If the statement is alluding to central bank purchases of foreign currency denominated assets, that option does not seem to be available to the BOJ. If it means purchases of goods and services (=a helicopter drop of money), that option is also not available to most of the central banks in the world. Under NCM central banks usually buys bonds of high quality. It is totally unclear whether such purchases will

raise inflation significantly, especially when long-term interest rates are already very low. What if the BOJ drove up stock prices to artificially elevated levels and kept buying to sustain those levels? Would significant wealth effects kick in and raise inflation? This is a possibility, but the side effects of the operation would be the loss of the price discovery function of the market.<sup>15</sup> The BOJ will also suffer from large capital losses when stock prices come down to reasonable levels.

The above discussion suggests another interpretation of the large market's response to Abenomics so far. It contains the use of expansionary fiscal policy as the second pillar of the policy package. In fact, the new government has already passed a bill for a 13 trillion yen supplementary budget. Continuation of an easy fiscal policy at a zero interest rate (a helicopter drop of money) is a sure way for inflation. The market may have discounted such a possibility. One problem with this interpretation is that no one knows how seriously the Abe administration is committed to using fiscal expansion as a tool to generate inflation. There seems to be obvious limits given the fiscal sustainability problem.

Finally, the yen had begun to turn around before the discussion of Abenomics started in earnest. The significance of the February 2012 dummy is an example. On September 16, the yen recorded a high of 77.13 against the dollar, but weakened to 80.36 by October 26. The major reason for this was the deterioration in Japan's balance of payments. The quarterly trade account recorded a larger deficit in 2012Q3 than in 2008Q4. The current account was in deficit in 2012Q4 for the first time since 1980. While the theoretical relationship between the current account and the exchange rate can be complicated, the market may have taken these as a signal to sell the yen. On this view the durability of the yen weakness will depend on future developments in Japan's balance of payments.

What then can we expect about the future of Abenomics? Given that there is a good chance that the market is overconfident about the BOJ's ability to raise inflation, there is a risk of disappointment. Such a possibility will become realistic if the BOJ is put to a test of the effectiveness of its policy measures. I pointed out above that quantitative easing changed the market's expectations for a while, but that it was not able to offset the

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<sup>15</sup> Curdia and Woodford (2010) argue that the economy would not respond to such artificially generated "bubbles".

deflationary pressure on the economy during 2001-02. As a result, asset prices went back to previous levels. Something similar could happen again.

It is significant, however, that the foreign exchange and stock markets' response to Abenomics has continued for four months already. Although debatable, such favorable market response could bring inflation up to 2 %, in which case the market's expectations will have become self-fulfilling. For this to happen, the stubbornly flat Phillips curve will have to become steeper.<sup>16</sup> This would perhaps also require a change in inflation expectations of the public, not just those of asset market investors. It remains to be seen whether such changes in expectations will be in fact brought about.

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<sup>16</sup> Watanabe (2013) estimates that Japan needs a 50 trillion yen increase in aggregate demand in order to raise inflation to 2% within two years, if the slope of the Phillips curve stayed the same as in the last ten plus years.

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Table 1 Examples of Non-traditional Policies	
<b>Forward guidance</b>	"A zero rate until deflationary concerns are dispelled" (BOJ: April 1999–August 2000) "the committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economy strengthens." (Fed: September 2012)
<b>LSAP1</b>	purchases of covered bonds, fixed rate full allotment operation, LTRO, OMT (ECB) purchases of CPs, equities (2002–04), term fund provision (BOJ) purchases of Agency bonds, Agency MBS, Treasuries (Fed: 2008–09) TALF: lending against securitized assets (Fed: 2009) US dollar repo (major central banks)
<b>LSAP2</b>	purchases of government bonds (2001–06), CME (2010–) (BOJ) purchases of Treasuries, Agency MBS, operations twist (Fed: 2010–)
<b>QE0</b>	current account balance targeting (BOJ: 2001–06)

Table 2: Regression Results on the Effectiveness of the BOJ's Policy Measures					
	Category		TOPIX	JGB 10yr	Yen/dollar
<b>ZIRP</b>	F.G.	1999.4.			
<b>Clarifying price stability, 3M Fixed Rate Ope.</b>	F.G./LSAP1	2009.12.			
<b>Quantitative Easing</b>	F.G./LSAP1,2	2001.3.			
<b>increases in the current account balances</b>		2001.8.			
<b>with increases in JGB purchases</b>		2001.12.			
		2002..2			
		2002.10.			
<b>Increases in the Current Account balances</b>	QE0	2003.4.			
<b>without increases in JGB purchases</b>		2003.5.			
		2003.10.			
		2004.1.			
<b>Facilitation of Corporate Finance, JGB Purchases</b>	LSAP1	2008.12.			
<b>JGB purchase increased</b>	LSAP1	2009.3.			
<b>CMP introduced</b>	LSAP2	2010.10.			
<b>Further easing</b>	?	2012.2.			
<b>Abenomics</b>	?	2012.12.			
Other independent variables: 10 yr US treasury rate, JP Morgan Global Manufacturing PMI, US initial unemployment claims, The Euro-dollar rate.					

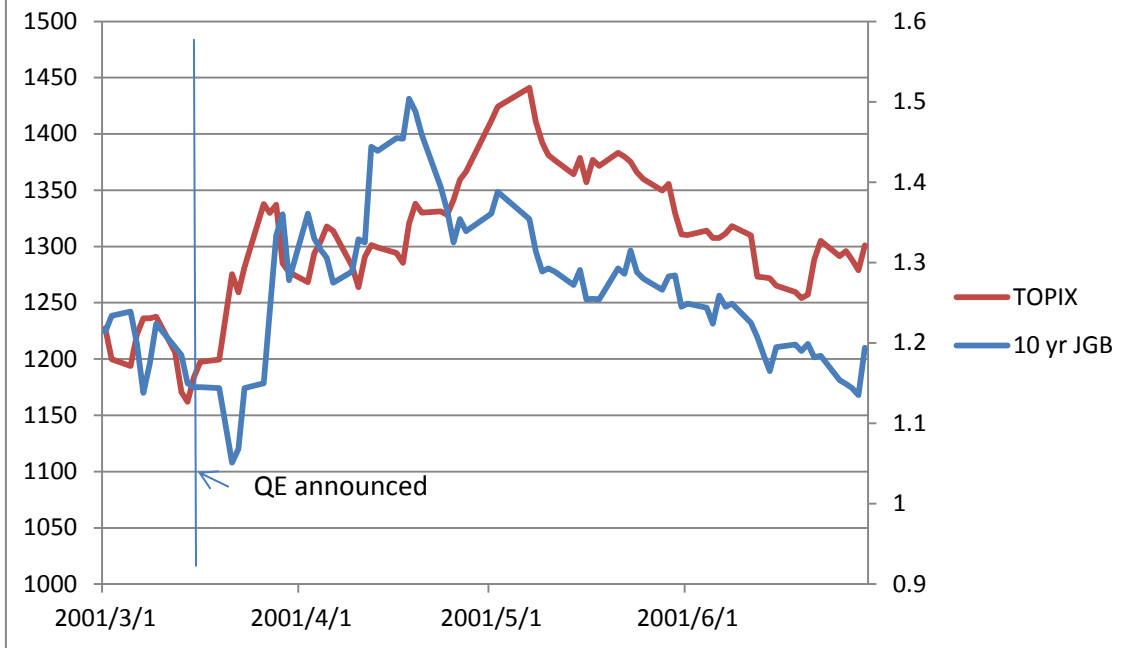
Table 3 Estimation results of the Soros equations							
	10 Yr US Treas	Dollar/Euro r	INSR	HJUS	HJ	HUS	SMPL
1	0.029 (3.35)	0.164 (2.21)	0.000265 (2.03)	0.178 (2.76)			1998.4–2013.1
2	0.0289 (3.35)	0.172 (2.31)	0.000289 (2.20)		0.0454 (0.42)	-0.232 (-3.15)	1998.4–2013.1
3	0.0337 (3.77)	0.257 (3.21)	0.000236 (1.71)	0.0557 (0.56)			1998.4–2008.8 & 2009.3–2013.1
4	0.0345 (3.85)	0.253 (3.15)	0.000237 (1.72)		0.0185 (0.17)	-0.143 (-0.948)	1998.4–2008.8 & 2009.3–2013.1

Notes: 1, INSR: US initial unemployment claims. HJ: monetary base (Japan). HUS: monetary base (US) HJUS=HJ/HUS.  
2, The dependent variable is the Dollar/Yen exchange rate.  
3, All variables are in log first differences except for the interest rate and INSR which are in simple differences.  
4, The equations also included a constant and the monetary policy dummies.

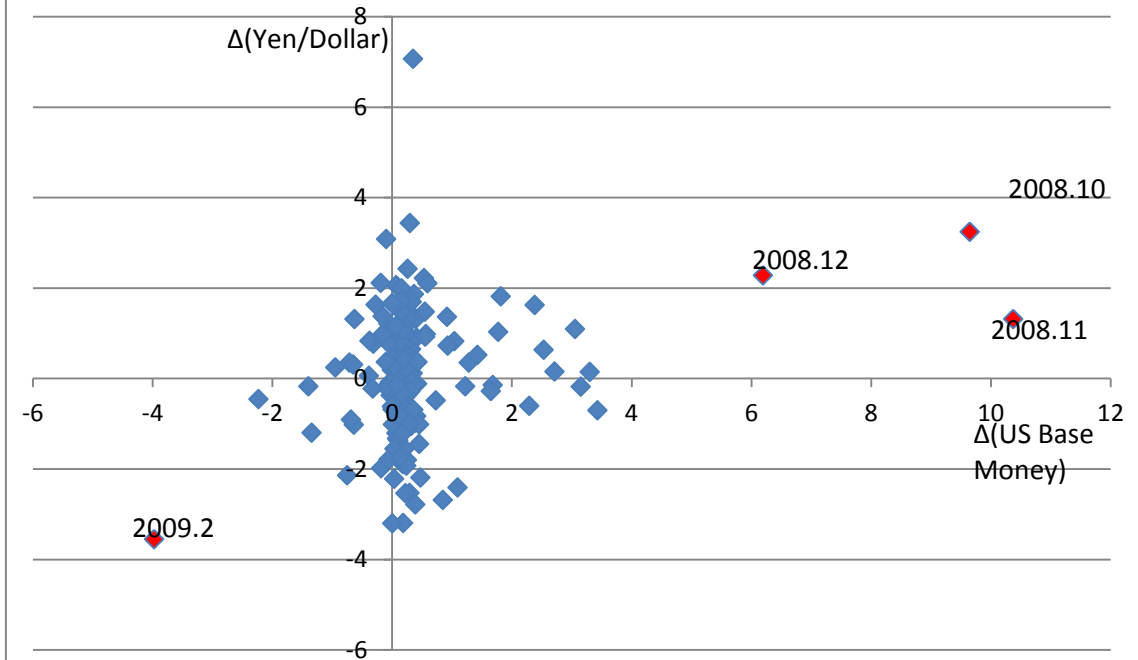
Table 4: Regression Results on the Effectiveness of The Fed's Policy Measures				
Date	Category	10 yr Treasury	S&P500	dollar/Euro
2008.11.	LSAP1			
QE1				
2008.12.	LSAP1			
QE1				
2009.3.	LSAP1			
QE1				
2010.8–11.	LSAP2			
QE2				
2011.8.	F.G.			
2011.9.	LSAP2			
MEP				
2012.9.	LSAP2/F.G.			
QE3				
2012.12.	F.G.			

Other independent variables: The FF rate, JP Morgan Global Manufacturing PMI, US initial unemployment claims.

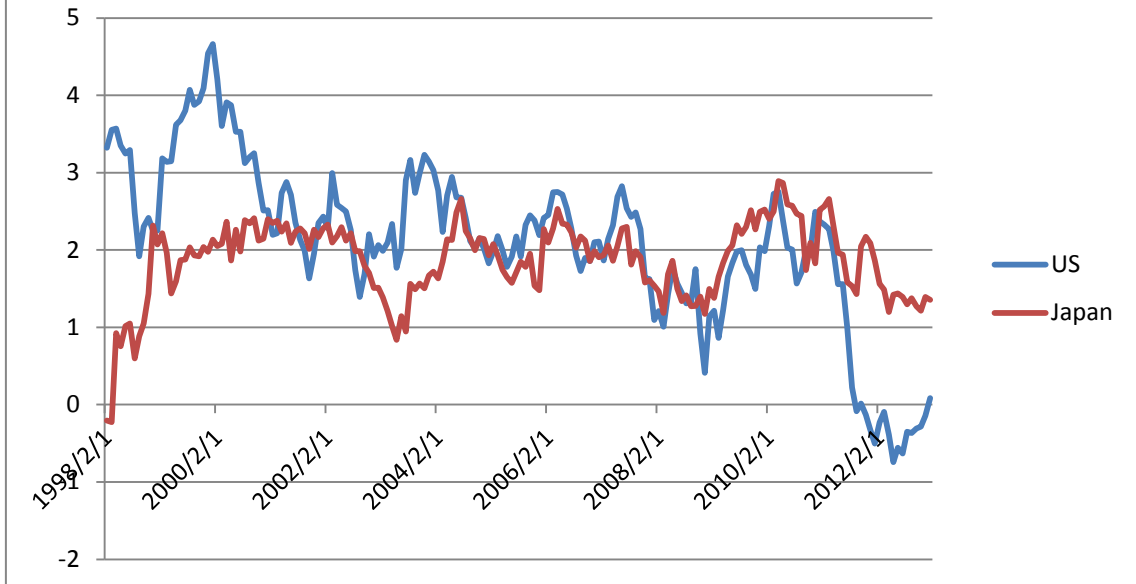
### Figure 1 Asset Price Response to Japan's QE



### Figure 2: US Base Money & Yen/Dollar



**Figure 3: 10 Yr Government Bond Rate- Core Inflation**



**Figure 4: Inflation, Stock Prices and Long-term Interest Rate in the U.S.**

