WP/16/157

IMF Working Paper

Reflating Japan: Time to Get Unconventional?

by Elif Arbatli, Dennis Botman, Kevin Clinton, Pietro Cova, Vitor Gaspar, Zoltan Jakab, Douglas Laxton, Constant Aime Lonkeng Ngouana, Joannes Mongardini and Hou Wang

INTERNATIONAL MONETARY FUND

 WP/16/157

IMF Working Paper

Asia and Pacific Department, Fiscal Affairs Department, and Research Department

Reflating Japan: Time to Get Unconventional?

Prepared by Elif Arbatli, Dennis Botman, Kevin Clinton, Pietro Cova,[*] Vitor Gaspar, Zoltan Jakab, Douglas Laxton, Constant Lonkeng Ngouana, Joannes Mongardini and Hou Wang

Authorized for distribution by Luc Everaert

August 2016

Abstract

Japan has ambitious economic goals: 3 percent nominal growth; 2 percent inflation; and a primary budget surplus. Abenomics has employed the three arrows of monetary, fiscal and structural policies, but the goals remain out of reach. We propose that countercyclical measures be embedded in long-run frameworks that anchor expectations for inflation and public debt. In addition, we argue for an incomes policy to assist reflation. Model simulations suggest that, combined, these proposals would make headway towards the goals, with, on balance, a better chance of success than the more unconventional policy alternatives proposed by Krugman, Svensson, and Turner from a risk-return perspective.

JEL Classification Numbers: E31; E39; E52; E62; E64

Keywords: Japan; monetary policy; fiscal policy; incomes policy; structural reforms

Author's E-Mail Address: earbatli@imf.org, dbotman@imf.org, kclinton@rogers.com, pietro.cova@bancaditalia.it, vgaspar@imf.org, zjakab@imf.org, dlaxton@imf.org, clonkeng@imf.org, jmongardini@imf.org, hwang2@imf.org

---

[*] Pietro Cova is an economist at the Bank of Italy. He contributed to this working paper while a visiting fellow of the IMF Research Department in the second half of 2015.

Contents **Page**

I. MOTIVATION

Since the bubble burst in the early 1990s, Japan has experienced deficient nominal and real GDP growth and repeated deflationary episodes. Monetary policy has been unable to get the economy out of the liquidity trap, given the Effective Lower Bound (ELB) on monetary policy rates. These factors together with repeated fiscal stimulus have led to rapid increases in the public debt to GDP ratio. Public gross debt to GDP has reached levels without precedent in peace time.

Prime Minister Abe's administration came to power in December 2012 to end this economic malaise with a policy package (the so-called *Abenomics*) consisting of *three arrows*: bold monetary policy, flexible fiscal policy, and a growth strategy that promotes private investment. The objective was to jolt the economy to higher sustainable growth, positive inflation, and, through flexible policy, public debt sustainability. Abenomics met with initial success. Strong coordination between the Bank of Japan's (BoJ) unprecedented quantitative and qualitative easing program and fiscal stimulus combined with ambitious structural reforms helped narrow the large output gap, reversed the undue appreciation of the yen, eased financial conditions, boosted corporate profits, and lifted actual and expected inflation into positive territory. The first consumption tax hike locked in considerable fiscal savings. The economy reached full employment and modest, but historically significant, increases in base wages took hold.

But the recovery and progress with reflation stalled. Headline inflation fell back into deflationary territory, dampening base wage growth. Growth dropped, with consumption and investment remaining sluggish, amid deteriorating sentiment. The yen has appreciated in recent months, equity prices have declined, and inflation expectations have fallen anew. Several factors explain the recent difficulties in achieving sustained lift off:

- **Structural impediments:** Low confidence in economic prospects, related to an aging and shrinking population, is holding back investment and credit demand. Labor market duality and inflexibility are clogging the pass-through from a tightening labor market, and from high profits at large firms, to wage increases. Weak demand and a lingering deflationary mindset are reducing the ability of firms to raise output prices. The financial sector does not sufficiently support risk taking, limiting access to risk-based capital, as suggested by high reliance of banks on fixed asset collateral and slow restructuring of non-viable SMEs.

- **Policy shortcomings:** The fiscal stance turned out to be too contractionary in 2014, over and above the anticipated consolidation due to the consumption tax hike. The stop-go nature of fiscal policy, with yearly supplementary budgets, discretionary changes in consumption tax hikes, and optimistic growth assumptions underlying medium-term budget projections have left fiscal policy without a credible medium-term anchor and are contributing to policy uncertainty. Weak monetary transmission, sluggish wage-price

dynamics, and a falling natural rate of interest are preventing the needed rise in inflation expectations, creating a communication and credibility challenge for the BoJ. Structural reform efforts did not sufficiently address the above-mentioned structural impediments, notably in the labor market.

- **Global weakness and volatility:** Sluggish global growth and overcapacity in the traded goods sector, prevented the weaker yen from materially boosting exports. Concerns in emerging markets and revisions to the expected path of monetary policy in advanced economies led to heightened volatility in financial markets and safe haven appreciation pressures. Declining commodity prices did not boost activity as expected, but instead put downward pressure on headline inflation and forced the BoJ to repeatedly push out its timeline for hitting the inflation target.

Slow wage-price dynamics amount to a missing link in the transmission of rising corporate earnings to inflation (actual and expected). This reflects a variety of cyclical and structural factors. First, residual slack in the economy—mainly due to a weak recovery in the manufacturing sector—is putting downward pressure on wages as employment growth is concentrated in the less productive services sectors. Second, a trend increase in female labor force participation, mainly in part-time jobs, is dampening average wage growth. Third, structural characteristics of the Japanese labor market—the low horizontal mobility of regular workers, an industrial relations system emphasizing employment stability over wage increases, and limited wage bargaining power—dampen upward wage pressures even in the face of a tight labor market. Furthermore, wage setting tends to be backward looking, based on recent actual inflation rather than the 2 percent target of monetary policy. Without strong efforts to resolve this market coordination blockage, attempts to raise nominal GDP growth will remain elusive.

Views differ on what to do next. The Bank of Japan (BoJ) believes that the current policy of injecting ¥80 trillion a year into bank system cash reserves through quantitative and qualitative monetary easing (QQE), combined with the recent adoption of marginal negative deposit rates, will raise the inflation rate to the target by early 2018. This projection assumes that energy prices rise, the output gap closes, inflation expectations become more forward looking, and upward wage pressures naturally emerge. The Ministry of Finance (MoF), however, is increasingly worried about the effectiveness of fiscal stimulus, and the rising debt-to-GDP ratio. The government nevertheless decided in May 2016 to postpone the 2 percent VAT increase by two and a half years, to October 2019, in view of the weakness in domestic and foreign demand.

Various policy proposals have been put forward in the academic world. Ito (2015) argues for further gradual VAT increases to bring about fiscal consolidation and avoid a fiscal crisis. Krugman (2015) advocates irresponsible fiscal and monetary policies to reach escape velocity that would bring about higher economic growth, increase inflation, and inflate the debt away. Svensson (2000) argues for a step depreciation of the Japanese yen, followed by

price level path targeting to get out of deflation. Turner (2015) puts forward one-off monetization of the fiscal deficit as a cure for the present malaise. He notes, however, that, while the technical aspects are straightforward, it would be difficult to rein in the incentives for politicians to abuse monetization in the future—especially in a high debt context such as in Japan.

In this paper, we propose a comprehensive policy package to get the Japanese economy to a higher sustainable growth path and end deflation. Since it reinforces the three arrows of Abenomics, we call it *Three Arrows Plus*. An unorthodox component of the package is an incomes policy aimed directly at sluggish wage-price dynamics. We build on the authorities' current policies by emphasizing the need for more credible and transparent monetary and fiscal frameworks that reinforce each other to reduce policy uncertainty and raise policy effectiveness. We emphasize structural reforms to end labor market duality, raise female participation, increase the labor force through foreign workers, and reform certain sectors of the economy. Although their short-term effects are uncertain, over time such reforms would raise the growth rate of potential output. The Three-Arrows-Plus package (monetary, fiscal, structural, and incomes policies) is coordinated to exploit synergies, and have the maximum chance of success.

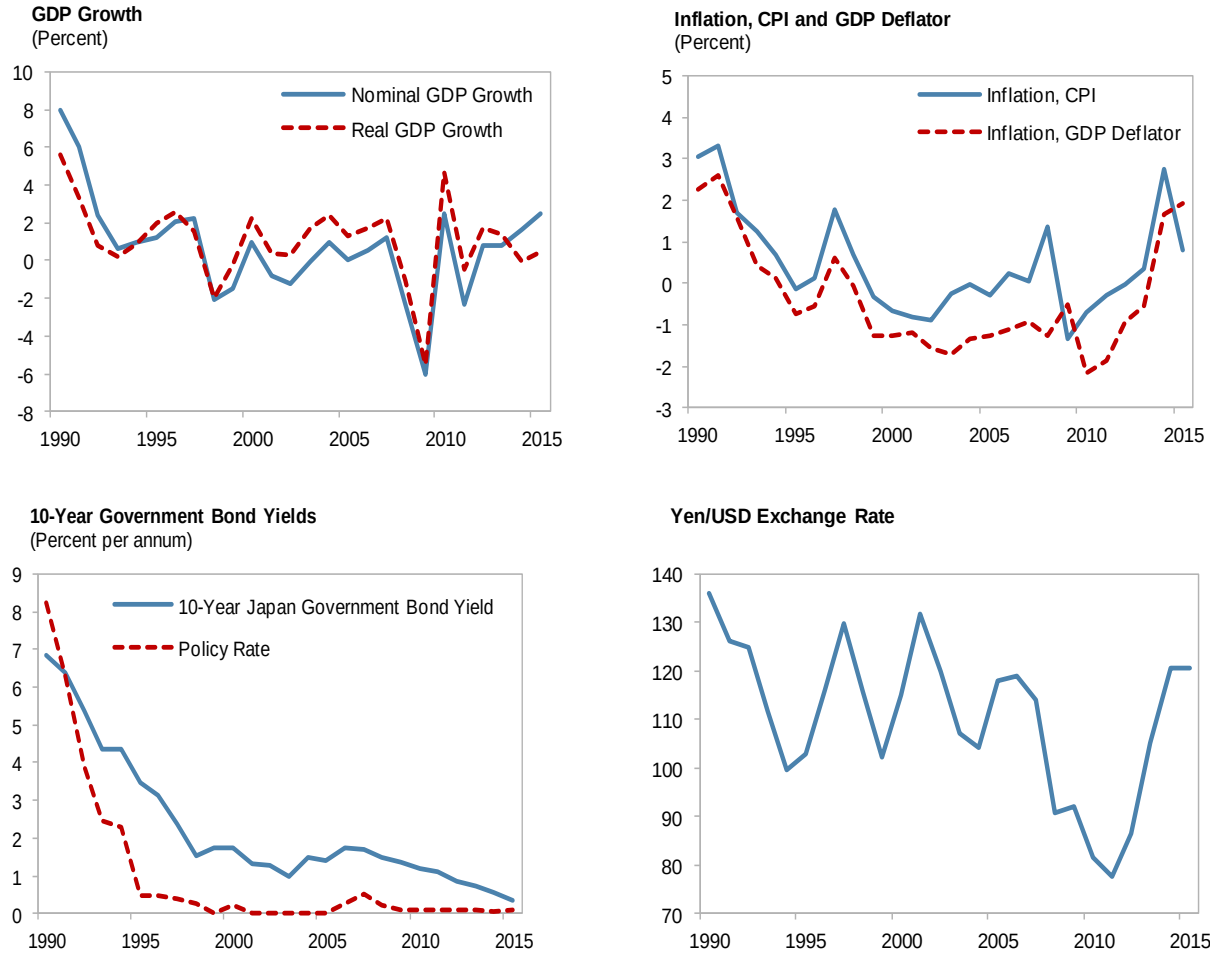
The remainder of this paper is organized as follows. In Section II, we review the economic history of Japan since the early 1990s, and ask why economic policy was not successful in moving the economy to higher nominal GDP growth. Section III discusses current labor market conditions and the reasons for the sluggish wage-price dynamics. In Section IV, we assess the divergent views on what to do next, both from the authorities and the academic world. The *Three Arrows Plus* package is outlined in Section V. This section references the U.S. incomes policy during 1933–35, which seems to have assisted a reflation. Section VI presents the simulations of our policy package and the alternative proposals, while Section VII outlines policy conclusions.

II. Experience Since the Early 1990s

Since the real estate crash of the early 1990s, the Japanese economy has been stuck in a quasi-equilibrium, with deficient nominal GDP growth and near-zero inflation. Part of the initial downturn in the economy was undoubtedly due to the inevitable balance-sheet adjustments following the real estate and stock market bubbles of the 1980s. More surprising is that, once the Japanese economy found itself in this quasi-equilibrium, a sequence of policies to jolt the economy into higher gear have been unsuccessful. Even today, the outlook for the Japanese economy continues to be mired in low-growth and near-zero inflation, and ahead lie significant risks of deflation, and, over the longer run, a fiscal crisis. We would argue that part of the reason for the lack of success in turning the Japanese economy around has been the absence of a comprehensive package. With the economy operating near full employment, this should include an incomes policy.

The historical evidence speaks for itself. Nominal and real GDP growth averaged only 0.7 percent and 1.0 percent during the period 1990–2015 (Figure 1). These numbers compare with 3.8 percent and 1.7 percent, respectively, for the average G-7 country excluding Japan. The weakness in GDP growth is explained to some extent by the aging and, more recently, declining population. Output per worker has grown broadly in line with trends in the United States over the last ten years, suggesting that the weak GDP growth cannot be explained by productivity. However, demographic trends alone are insufficient to explain the low nominal GDP growth and the repeated bouts of deflation that have occurred over the last 25 years.

Figure 1. Japan: Selected Economic Indicators



As measured by the consumer price index (CPI), inflation has averaged 0.5 percent since 1990, with mild deflation most of the time (Figure 1).[1] Using the GDP deflator annual inflation has averaged -0.3 percent, with almost 2 decades of continuous deflation, from 1995 to 2013.

Monetary policy responded with a delay to the recession that followed the real estate crisis of the early 1990s (McCallum, 2003). The BoJ reduced its policy rate so slowly, that real interest rates rose, as inflation turned negative. By the turn of the century the BoJ had cut the policy rate to zero, and long-term bond yields had declined to less than 2 percent, but the economy did not mount a sustained recovery. Macro-financial linkages contributed to the sluggishness. For example, Caballero and others (2008) argue that subsidized lending to failing firms (so called "zombie lending") decreased investment and employment; Kwon and others (2015) estimate that zombie lending decreased aggregate productivity growth by distorting resource reallocation of firms.

In addition, the exchange rate did not act as a shock absorber for most of the period. This was particularly evident during the Great Recession of 2008–09, when the Japanese yen appreciated against the U.S. dollar. Monetary and fiscal policies were evidently not successful at raising long-term inflation expectations, and anchoring them at a level that would allow the policy rate to get off the floor. Policy therefore did not generate interest rate space to guard against future deflationary shocks.[2] More recently, the BoJ has stepped up its unconventional monetary policy through successive rounds of QQE that reduced long-term yields on government and corporate bonds to extremely low levels. In addition, the BoJ added a tool to its policy kit with the adoption of the negative interest rate policy (NIRP) in January 2016, amid a weakening of the outlook and heightened global uncertainty. This widening of the policy options helped reinforce the BoJ's commitment to its inflation target. So far, the NIRP has been successful in lowering the entire yield curve and has not adversely impacted market functioning, beyond expected effects on JGB liquidity and bank profitability. The effectiveness of these measures in stimulating growth and inflation, however, has been mixed in the face of the lack of a credible macroeconomic framework, and nonlinearities associated with the deflation at the ELB.[3]

---

[1] The recent spike in inflation in 2014 reflects the impact on consumer prices of the increase in the Value Added Tax (VAT) by 3 percentage points to 8 percent as of April 1, 2014.

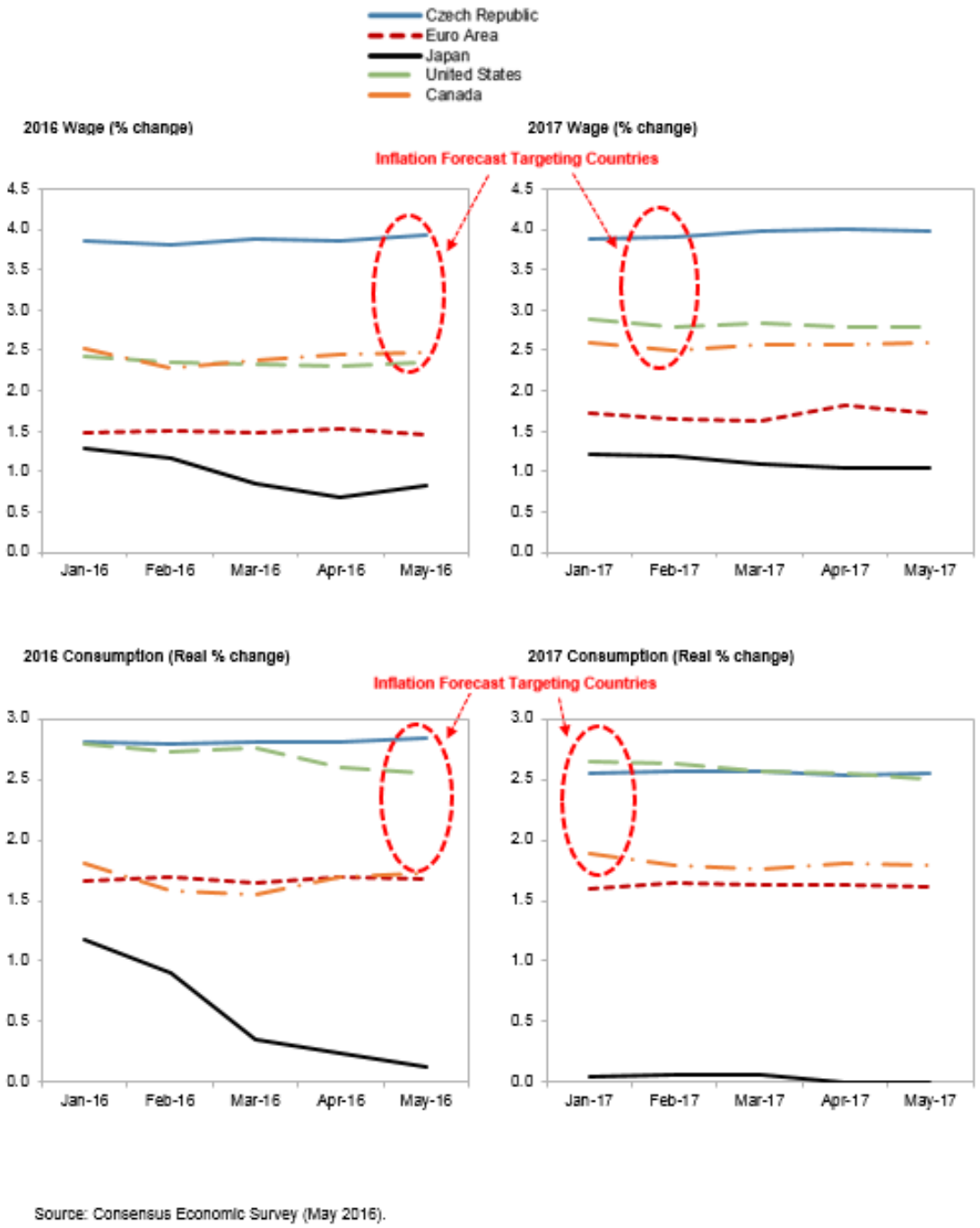
[2] See Clinton and others (2015).

[3] See Blanchard (2014).

A series of fiscal stimuli since the 1990s provided support to domestic demand, particularly in the form of public investment, and helped to avoid a deeper deflationary spiral. However, the on/off nature of these stimuli, combined with a lack of a credible fiscal framework, reduced their effectiveness, and led to significant volatility in the fiscal balance. Government net debt rose sharply over the period to reach 125 percent of GDP by end-2015. Gross government debt is about twice as high. Over 95 percent is domestically held, by Japanese institutions (pension funds, banks and other financial institutions), and households. The large and rising debt burden has raised concerns about how the long-run budget position will be managed, and about a possible debt crisis if Japanese savers one day lose their strong preference for domestic assets.

The outlook for nominal aggregate demand in Japan remains grim. Based on the latest consensus economic survey of May 2016, wage growth in Japan is expected to be 0.8 percent in 2016 and 1.0 percent in 2017, well below other advanced economies (Figure 2). As a consequence, consumption growth is likely to be just above 0.1 percent in 2016 and 2017. According to the July 2016 World Economic Outlook, real GDP is projected to grow by 0.5 percent in 2016 and 0.3 percent in 2017, while potential growth will decline slowly towards zero over the long-term, suggesting that the near future is likely to continue along similar trends as the past.

Figure 2. Wage and Consumption Outlook for Selected Countries

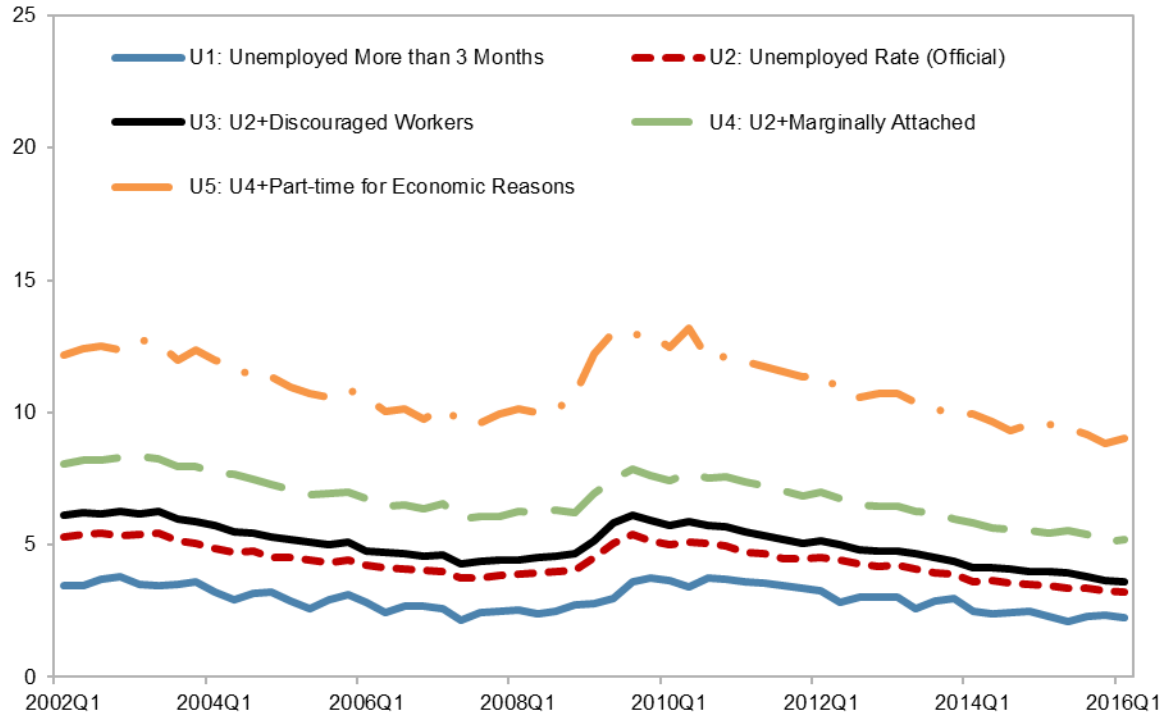


Source: Consensus Economic Survey (May 2016).

III. Tight Labor Market but Sluggish Wage-Price Dynamics

Japan's labor market has tightened considerably in recent years judging by a range of standard metrics.[4] The unemployment rate has declined among all age groups and types of unemployed. Alternative measures of labor underutilization taking into account discouraged workers, workers who are marginally attached to the labor force, and part-time employment due to economic reasons confirm the significant reduction in labor market slack (Figure 3). Other indicators such as vacancy rates, the job applicant-to-openings ratio, and survey-based measures confirm a considerable tightening in the labor market in recent years.

Figure 3. Alternative Measures of Labor Market Underutilization
(Percent)



Source: Japan Labor Force Survey and IMF staff caculations.

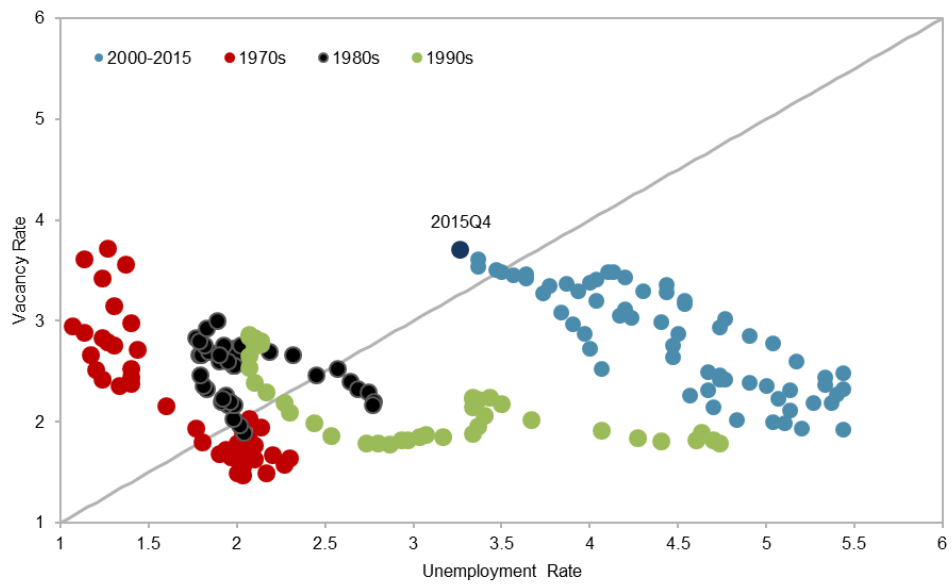
[4] One approach following Hara and others (2006) is to calculate "structural" unemployment over time using the position of unemployment and the vacancy rate at any point in time relative to the 45-degree line and assuming a similar slope as observed during 1988-1993 to compute the level of structural unemployment. To control for the impact of demographic changes on the unemployment rate over time, we conduct this exercise using a demographics-adjusted unemployment rate constructed by holding the age-composition of the labor force constant over time (at 1990 levels).

The paradox between observed tightness in the labor market amid overall slack in the economy could reflect a shift towards part-time workers as evidenced by the considerable decline in total hours worked. Furthermore:

- *A weak relationship between unemployment and output in Japan.* Estimates of Okun's Law for Japan yield a relatively low sensitivity of unemployment to output—a 10 percent increase in output is estimated to reduce unemployment by 1.2 percentage points based on Steinberg and Nakane (2011), which is lower than estimates for other G7 countries with an estimated response of about 4 percentage points. This could reflect strong employment protection enjoyed by regular workers and downward nominal wage flexibility (owing to a relatively high share of bonus payments in total compensation).

- *Labor market mismatches*: There is some evidence that labor market mismatches have increased—consistent with a shift in the Beveridge Curve in the 1990s—leading to a higher vacancy rate for a given level of unemployment (Figure 4)[5]. Ganelli and Miake (2015) also point to increasing labor shortages in the services and construction sectors and among specialists and technicians.

Figure 4. Japan: Beveridge Curve



Source: Haver Analytics and IMF staff calculations.

[5] Findings in Shibata (2013) indeed suggest an important role for labor market mismatches in Japan.

Nominal and real wages have not fully reflected the tight labor market conditions, and have remained too subdued to achieve the BoJ's inflation target in a sustained manner. Factors that contribute to sluggish wage growth include both cyclical conditions and structural features of Japan's labor market:

- *Shifting fortunes from manufacturing to services with lower labor productivity and wages:* the higher level of, and growth in, labor productivity and wages in the manufacturing sector imply that the rising share of employment in the services sector has reduced average wage growth.

- *Increase in the share of part-time employment*, concentrated in the services sector.

- *The low horizontal mobility of regular workers*. Under Japan's lifetime employment system, a wage increase in competitor firms may not create wage pressure, because workers are unlikely to switch jobs. By the same token, firms do not have incentives to raise wages to try to fill positions. In addition, Japanese regular workers are typically hired as generalists. They are expected to work in several different positions and duty stations within the company. This employment model reduces incentives for firms to increase wages to attract workers from outside to fill specific positions, because existing workers can be reassigned.

- *An industrial relations system emphasizing employment stability over wage increases*. Unions and workers have been willing to accept wage moderation in exchange for low unemployment and employment stability (of regular workers).

- *Limited wage bargaining power.* Wage bargaining is taking place at the firm level in coordinated industry-wide bargaining rounds, the so-called Shunto. However, parties involved comprise mainly large firms and regular workers. With the rapid rise in the proportion of non-regular workers, the importance of the Shunto has waned. Unionization rates have declined and labor conflicts have all but disappeared, suggesting a fall in the wage bargaining power of labor. As a further indication, real wages have not kept up with productivity over the past two decades, more so than in most comparable economies. These developments have helped Japan slip into and stay in a low inflation environment (Porcellachia (2016)).

- *In addition to these factors, a coordination problem could lie at the center of sluggish wage-price dynamics.* Low actual and expected inflation have contributed to stagnant nominal wages. An entrenched deflationary mindset and backward-looking inflation expectations are generating weak nominal wage growth. Unions and employees look at recent actual headline inflation in their negotiations, rather than setting wages in anticipation of the 2 percent inflation targeted by monetary policy. Public wage setting takes the same approach, following developments in the private sector rather than leading in line with the authorities' inflation target.

Given these factors, unless there is a significant change of policies, the labor market may not be tightening enough to foster wage increases in line with the inflation objective. This underscores the need for of a new incomes policy to accompany short-term demand stimulus to remove residual slack in the economy. Labor contract reforms that reduce duality and efforts to increase mobility would stimulate wage-price pressures in a more sustained manner.

IV. DIVERGING VIEWS

While there is agreement on the need for a stronger policy package to exit the ELB, both the authorities and the academic world diverge on the appropriate policy mix. Our proposal develops a comprehensive approach that is based on multiple instruments to achieve the objective of ending deflation, generating higher sustainable nominal and real GDP growth, and putting debt on a downward path.

The BoJ believes that its current policy of QQE and NIRP, together with rising energy prices, the closing of the output gap, and strengthening wage-price dynamics will result in inflation expectations becoming more forward looking in the near term, bringing inflation to about 2 percent by early 2018. We argue that an explicit inflation-forecast-targeting framework for monetary policy, based on adjusting instruments to achieve objectives, would increase the transparency and effectiveness of monetary policy actions. The reduction in policy uncertainty would help over time to anchor longer-term inflation expectations.[6]

The Japanese government emphasizes the need for fiscal consolidation to address the rising debt-to-GDP ratios, and for flexibility in the near term to support the recovery. The fiscal stance has been contractionary, with the structural primary deficit declining from 7.5 percent of GDP in 2013 to 4.5 percent in 2015, in part because of the increase in the consumption tax rate from 5 to 8 percent in April 2014. In May 2016, the government announced, for the second time, a postponement of the VAT increase to 10 percent from April 2017 to October 2019. A fiscal policy framework that responds to macroeconomic conditions in the short term, while maintaining the goal of debt sustainability for the longer run, could help eliminate such policy uncertainty, and reduce the tail risk of a fiscal crisis.

In the academic world, the concerns of the government are echoed by Ito (2015), who advocates further gradual increases in the VAT rate. Ito (2015) argues that, despite a large home bias among savers, Japan could face a fiscal crisis in the early 2020s as household savings decline and the high government financing requirement will need to be increasingly met by foreign investors, pushing up interest rates. He advocates a balanced package of

[6] See Clinton and others (2015).

reforms, comprising fiscal adjustment, continued monetary easing, and an acceleration of structural reforms.

Krugman (2015) proposes *Irresponsible Fiscal and Monetary Policy* to end deflation. He argues that monetary policy alone cannot get Japan out of deflation, which is a necessary condition to reduce real interest rates and make debt sustainable over the long run. Under these conditions, it is therefore necessary to have a burst of fiscal stimulus and monetary easing sufficiently strong to reach "escape velocity." As the Philips curve is relatively flat in Japan, the required stimulus would need to be very large. Financial markets might respond negatively to a burst of such a large fiscal and monetary stimulus without appropriate policy frameworks to maintain debt sustainability and anchor inflation expectations. As a result, term premiums and risk premiums could rise, offsetting the impact of the stimulus (Appendix II).

An alternative approach proposed by Svensson (2000) is to use the exchange rate and a price-level-path targeting (PLPT) framework as instruments to end deflation. The so-called *Foolproof Way* consists of implementing: 1) an upward-sloping PLPT path; 2) an initial depreciation, followed by a crawling peg of the currency to reach the desired PLPT path; and 3) an exit strategy in the form of the abandonment of the crawling peg in favor of inflation or PLPT when the price-level target path has been achieved. In the case of Japan, there are legal obstacles to implementing Svensson's proposal as the Ministry of Finance (MoF) is responsible for exchange rate policy while the BoJ is not allowed by law to intervene in the foreign exchange market. Furthermore, even if one assumes that these legal obstacles can be overcome by close coordination between the MoF and the BoJ, or by changing the central bank law, the amount of depreciation needed to exit deflation could be considerable, as the Japanese economy is relatively closed. In addition, given perceptions that a considerable depreciation would divert demand away from other economies, it would be necessary to use other measures (forward guidance and more QQE to reduce real long-term interest rates) to more directly stimulate both domestic demand and imports from other economies (Appendix III).

Turner (2015) argues that the way out of deflation is for Japan to monetize a portion of its deficit—we call his proposal *Monetization of the Deficit*. A one-off monetization would increase nominal GDP, with the advantage of not adding to the fiscal debt burden. *Monetization of the Deficit* has a positive impact on real growth to the extent that the private sector does not completely offset the increased public spending by private savings. Turner argues that the more difficult problem is how to avoid the political incentives to abuse monetization. To address this problem, he proposes legal limits on the use of deficit monetization to only exceptional circumstances. While it is clear that monetizing the deficit would expand nominal GDP, it could lead politicians to delay fiscal measures necessary to get to a sustainable debt level (e.g., VAT increases) regardless of the legal limits imposed. The private sector therefore may anticipate that dealing with the unsustainable fiscal position would ultimately require higher taxes or, more importantly, repeated monetization. This

could result in an inflation scare, where the private sector no longer believes in the central bank's monetary policy regime, thus resulting in a ratcheting up of inflation expectations, higher real interest rates and renewed unsustainable growth in debt (Appendix IV).

V. The Three-Arrows-Plus Policy Package

Our proposed policy package starts from the premise that a coherent and comprehensive approach is necessary. We see merit in all the proposals discussed above, including Abenomics. Our proposal embeds monetary and fiscal stimulus in a long-term framework to stabilize expectations, and adds the instrument of incomes policy. The latter would aim to raise wage inflation to around 3 percent, a rate consistent with the BoJ inflation target of 2 percent for consumer prices plus 1 percent productivity improvement. Appendix I provides a description of the model and the simulations.

A. Arrow 1: An Inflation-Forecast-Targeting Framework

Monetary policy in Japan needs to be cast in a credible and transparent framework that is able to anchor inflation expectations over the medium term. We recommend that the BoJ moves to an inflation-forecast-targeting (IFT) framework, where monetary policy responds to deviations of the inflation forecast from the 2 percent target. The BoJ forecast of inflation would become an ideal intermediate target for monetary policy. It would be based on all available information and views about the state of the economy. It would also be used to communicate in a credible and transparent fashion how the BoJ is managing the short-run output-inflation tradeoff. By doing so, the BoJ would build up credibility with financial markets and better anchor long-term inflation expectations to its 2 percent target (Box 1).

The experience of other IFT countries shows that the framework is flexible enough to work at the ELB. In the case of Canada, the Czech Republic and the U.S., the framework has been adapted through a number of policy instruments in order to achieve the inflation target. In the case of Canada, the credibility of the IFT framework has allowed the Bank of Canada to successfully induce a deprecation of the exchange rate since 2014 to soften the impact of the fall in commodity prices on the economy (Clinton and others, 2015). In the case of the Czech Republic, the central bank announced an exchange rate ceiling of 27 koruna per euro on November 7, 2013 to fend off the risks of deflation (see Alichi and others, 2015a). The ceiling implied a step currency depreciation of about 5 percent. The policy was fully credible and the exchange rate moved in a matter of days to the ceiling. As a result, inflation picked up and real interest rates fell, thus inducing a recovery in growth. In the case of the United States, quantitative easing and forward guidance since the adoption of the IFT framework in 2012 have kept long-term inflation expectations anchored to the 2 percent target, despite the fall in commodity prices (see Alichi and others, 2015b).

Box 1. Strengthening the Bank of Japan's Communication Framework

Effective BoJ communication, followed by consistent policy action, is an essential ingredient to defeat the deflationary mindset. Policy predictability and credibility is crucial in order for the central bank to impact long-term interest rates, anchor inflation expectations, and reduce excessive asset price volatility. Achieving these objectives requires that the public has a good understanding of the policy-setting process and underlying assumptions. For the BoJ, communication is likely to play a particularly important role for at least two reasons. First, with the policy rate close to the ELB, guidance about future policy actions becomes vital. Second, the BoJ faces the formidable challenge of anchoring inflation expectations at a level well above those observed during the past two decades. The BoJ guidance under QQE was a clean break from the past, initially lifting inflation expectations, but more recently it appears to have caused market confusion.

The adoption of an explicit inflation target in January 2013 constituted a major advance in transparency. The BoJ has taken other significant measures to improve transparency and accountability in recent years, including through its quarterly reports that discuss the baseline outlook and associated upside and downside risks, providing point estimates for inflation and GDP growth by individual policy board members, and disseminating minutes and summary opinions from Monetary Policy Meetings. This was shortly followed in April 2013 with the introduction of QQE and a commitment to achieve the target "at the earliest possible time within a time horizon of about two years," and "to continue with QQE until 2 percent inflation has been achieved in a timely manner." The initial impact of the regime change was a boost to policy credibility and a rise in inflation expectations, triggered by the sharp depreciation of the yen.

However, after 3 years, the need for stronger communications, as part of a more effective strategy, is suggested by the fact that the economy remains in a dark corner, with interest rates at their floor, and long-term inflation expectations well below the 2 percent target. Moreover, financial markets have been caught off-guard repeatedly—this includes occasions when the BoJ adopted new easing measures or made technical changes to its framework, and also when policy did not react to a deteriorating inflation outlook. These are symptoms of a low degree of policy predictability, and uncertainty in financial markets about the BoJ commitment to use its instruments to achieve the announced policy objective.

To help reduce policy uncertainty, and better anchor inflation expectations, the BoJ should publish a medium-term baseline forecast, with a path for its key policy instruments (policy rate and balance sheet), that is consistent with achieving the 2 percent inflation target.

- *The policy settings would be endogenous, determined by a reaction function, designed to hit the target over the medium term*.[1] The reaction function incorporates policymakers' preferences of short-run tradeoffs between the output gap, deviations of inflation from target, and instrument variability. These preferences, in turn, determine the time profile by which inflation goes to target; the time horizon for meeting the target does not need to be pre-specified.

[1] *"Individual Policy Board members make their forecasts taking into account the effects of past policy decisions and with reference to views incorporated in financial markets regarding future policy. Specifically, each Policy Board member makes an assumption about the future path of short and long-term interest rates based on their market rates, with the difference in the outlook for prices between that presented in the Outlook Report and that of market participants in mind."* (see Bank of Japan, 2016). The interest rate forecast for inflation-targeting central banks should be endogenous. If the interest rate (or other instruments) does not respond endogenously to eliminate deviations of inflation from target, the system has no nominal anchor. Under current circumstances in Japan, especially, it is crucial that this anchor be firmly established.

Box 1. Strengthening the Bank of Japan's Communication Framework (concluded)

- *The published baseline policy rate path would, through expectations, influence the term structure of interest rates, the exchange rate, and asset prices, in a manner helpful for the efficient achievement of policy objectives*. This improves the effectiveness of the policy rate as an instrument of monetary policy. This, in combination with other policies, would make the path for inflation more credible.
- *The baseline provides a common point of reference for Policy Board deliberations.* Members of the Policy Board may have differences with the staff's baseline forecast. Where these are substantial, a member may publish a reservation as in other central banks that have adopted an IFT framework. This would not be a radical change from the current practice at the BoJ, considering that members' dissenting votes on policy actions are recorded.
- *Confidence bands would indicate the estimated range of uncertainty around the baseline forecasts.* In countries where the central bank publishes the forecast path for the interest rate, markets have quickly accepted that this forecast is conditional. Confidence bands underscore the point.
- *Alternative scenarios would show the implications of selected shocks, or of basic differences in forecast assumptions that may exist among policymakers*. The BoJ should discuss contingent policy paths under alternative outlook scenarios. This would generate a better understanding of the BoJ approach to managing the macroeconomic risks, and thus help improve policy predictability. It also would reinforce that the baseline forecast is conditional.

In the case of Japan, the adoption of the IFT framework is necessary but unlikely to be sufficient to jolt the economy out of the ELB as the framework is unlikely to be credible upfront. It will therefore require support from fiscal policy, incomes policy, and structural reforms to be effective in getting the economy out of deflation.

Monetary policy would need to continue to be managed flexibly with all easing options remaining on the table to respond to demand conditions in the economy. The objective would be to plan for a modest overshoot of the long-term 2 percent inflation target in order to get the economy permanently out of the ELB. If the response to fiscal or incomes policy or structural reforms is stronger/weaker than expected, monetary policy would need to adjust flexibly to provide less/more stimulus as needed in order to ensure the attainment of the inflation target over the medium term.[7]

[7] In our proposed policy scenario, we model further Quantitative Easing as described in Appendix I. Unconventional monetary policy measures are modeled through a compression in term and corporate risk premia.

B. Arrow 2: The Fiscal Policy Framework

Japan's fiscal policy would benefit from a transparent framework to manage public sector balance sheet risks over the long term, while maintaining the flexibility to support monetary policy as appropriate. The challenge for fiscal policy is to preserve debt sustainability, given the large debt burden. As pointed out by Krugman (2015), this ultimately depends on exiting deflation, and thereby reducing long-term real interest rates as well as increasing growth. This requires a skillful fiscal policy mix that supports BoJ inflation targeting through higher public wages and transfers, while increasing VAT rates in small steps over a very extended time period to bring debt on a sustainable path. The advantage of committing to a path of small, rather than less frequent, larger-step, consumption tax hikes would be to avoid the volatility and uncertainty from large intertemporal substitution effects, and to minimize the ultimately negative effects on spending.

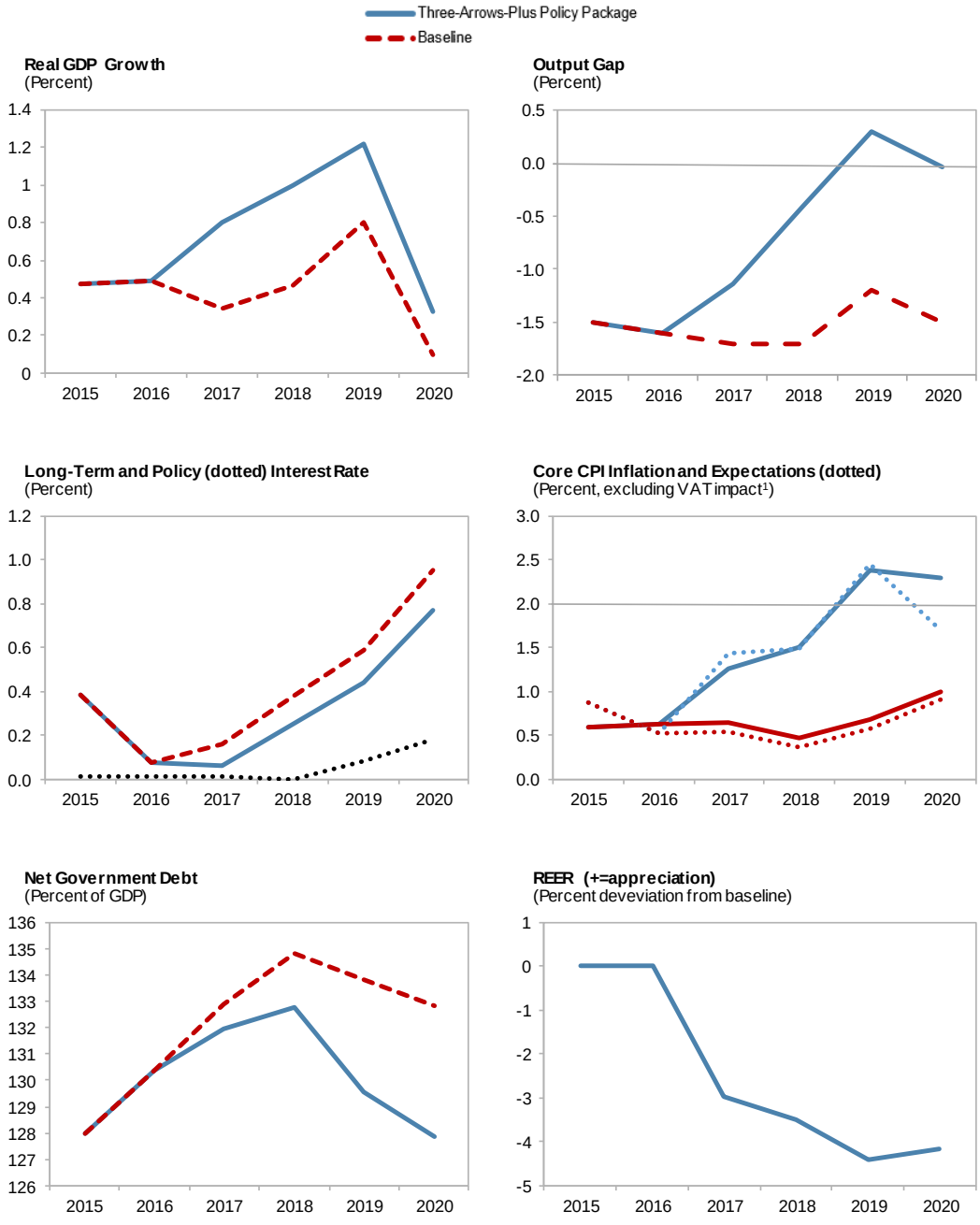
The fiscal framework would need to be backed up with a credible fiscal rule and institutional reforms. The fiscal rule would establish a medium-term fiscal path that minimizes public finance balance sheet risks, while allowing for anti-deflationary escape clauses. The rule would also be guided by a clear and transparent fiscal compass that could be tied to the general government net worth. The fiscal rule would need to be supported by institutional reforms geared towards improving fiscal transparency and budget procedures, updating of the general government consolidated balance sheet, strengthening fiscal risk management, and setting up of an independent fiscal council. The fiscal council would validate long-term projections, provide a real-time assessment of the macro-effects of policy actions in the near term, and of their long-term impact on the public sector balance sheet (see also Kopits (2016)). This dissemination of views would ultimately contribute to foster public debate over the conduct of fiscal policy.

In support of the incomes policy (see below), the fiscal stimulus would need to be reoriented, to increase public sector wages, and transfers to low-income households. The government should commit to raise public sector wages by 3 percent each year for the foreseeable future, and hence to lead, rather than lag, private sector wage setting. Such policies would ensure a significant boost to domestic demand without a large deviation from the debt stabilization path. They would also reduce the likelihood of an increase in term premiums as under the Krugman proposal (see Appendix II).

Structural fiscal consolidation would rely heavily on a very gradual increase in VAT rates to increase revenue and stimulate inflation. Under our proposed policy package, the government would commit to a gradual increase of 0.5 percentage points in the VAT rate each year starting with the fiscal year 2017/18 in order to get the VAT rate to 15 percent by fiscal year 2029/30. Such policies would ensure a gradual decline in the debt-to-GDP ratio over the long term. However, if the authorities decide to pursue their current strategy, it will be important to plan for a fiscal stimulus offset to reduce the negative impact of the VAT increase. Figure 5 shows the impact of the authorities' current strategy compared to our proposed policy

package. In practice, the precise path should be mindful of the need to secure political buy-in, in view of the compliance costs for firms, and the administrative burden for the tax authorities.

Figure 5. The Authorities' Current Strategy with the VAT Increase vs. the Three- Arrows-Plus Policy Package



Source: Authors' simulations.
1 Direct VAT impact is 0.3 and 1.0 percent in the Baseline scenario for 2019 and 2020, respectively. Direct VAT impact in the Three-Arrows-Plus Policy Package is 0.4 percent for 2017 and 0.5 percent thereafter.

C. Arrow 3: Structural Reforms

The third arrow of our proposal is to implement structural policies to reduce labor market duality, increase the labor force through foreign workers, and boost potential output. Essential to higher long-term growth is a set of structural reforms that reverses the trend in product offshoring and makes Japan an attractive place to invest again by raising future demand expectations.

The weak growth performance over the last two decades has created a segmented labor market. One segment of the labor market continues to be governed by the regular lifetime employment model, under which employers refrain from firing workers and workers implicitly commit to stay with the same employer until retirement. This segment mostly comprises male workers. A second segment has emerged in recent years where firms provide only temporary employment to non-regular workers (mostly females) without the benefits of regular employment. This labor market duality can reduce productivity in the economy to the extent that it reduces effort of non-regular workers and the training employers are willing to provide to them. To reduce this labor market duality, Aoyagi and Ganelli (2013) propose the introduction of a single open-ended contract for all new hires, in which employment protection increases with tenure.

Eliminating market duality, however, may not be sufficient to respond to the challenge of an ageing and declining population. In this context, increasing female participation in the labor force could be one important avenue. Female labor force participation, at 65 percent in the 15–64 years age group at end-2014, has increased significantly since the advent of Abenomics.[8] There is, however, still room for improving female participation by encouraging employers to provide flexible work arrangements and child care support to working mothers. Moreover, the Japanese authorities could also consider increasing the numbers of working visas for foreign workers, which would allow employers to respond to labor shortages by importing labor. According to the Statistics Bureau of Japan (2011), foreign-born workers in Japan only accounted for 1.3 percent of the total labor force in 2010, well below the advanced economy average.

Beyond labor market reforms, sectoral reforms could also help increase potential output. The agricultural sector could be reformed to eliminate the traditional support to certain food staples. Tax incentives could be expanded to foster research and development. Finally, financial sector reforms could foster incentives for raising risk capital and restructuring small- and medium-sized enterprises.

---

[8] See International Monetary Fund (2015b).

Overall, structural policies could provide a significant long-term boost to potential output. This would make it easier to sustain economic growth, end deflation and make the debt sustainable over the long run.

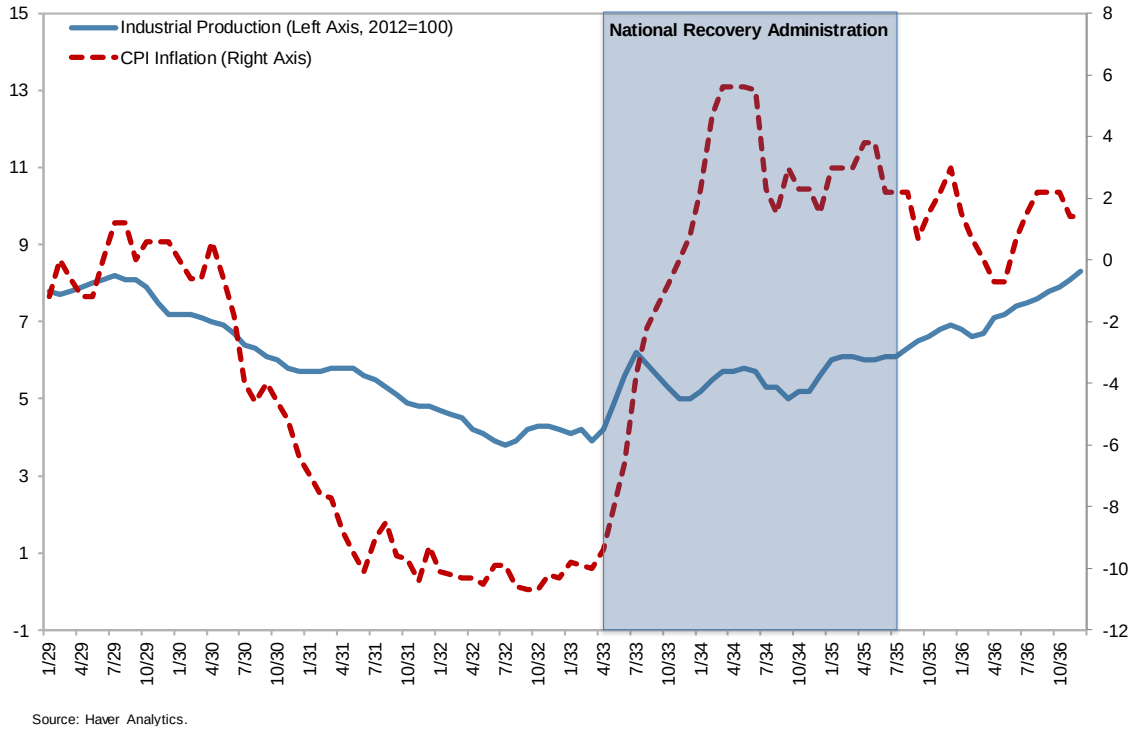
D. The Plus: Incomes Policies

The new arrow of the proposed policy package is an incomes policy for Japan to put an end to low wage growth and induce inflation (through cost-push pressures) to move in line with the BoJ target. It would build on recent measures taken by the authorities, including tax incentives for firms that raise wages, higher minimum wage increases, and moral suasion to encourage wage growth. This would be done through the wage policy of the public sector (see fiscal policy section above) and a "comply or explain" policy for the private sector. The "comply or explain" policy would be similar to the regulatory approach used in Japan, Germany, the Netherlands, and the UK in the field of corporate governance and financial supervision. The government would announce a wage inflation guideline, which companies would then either need to comply with, or explain publicly why they cannot. The wage inflation target would not be a binding law as the purpose of this policy is to reject a "one-size fits all" policy, given differences in productivity and relative prices across the economy. It should be noted that the objective of the incomes policy is not to induce changes in relative prices, higher real wages, or a reduction in competiveness but rather to move all nominal variables in line with the BoJ's inflation target.

The experience with incomes policy has been mixed. When used during periods of war or high inflation, incomes policy has been mostly ineffective in limiting the increase in the price level and has often resulted in supply shortages. This was the case during the French revolution in 1793, where the *loi du maximum* legislated price limits and fines to deter price gauging during the *assignats* hyperinflation. These price limits resulted in significant supply shortages and were abandoned after a few months. Regulated price and wage increases also produced supply shortages in the 1970s and 1980s when they were used to respond to the two oil price shocks in Australia, Canada, France, Italy, New Zealand, the UK and the US.

The U.S. incomes policy during the Great Depression was, however, effective in ending deflation (Figure 6). As part of the New Deal, President Roosevelt established the National Recovery Administration (NRA) in early 1933 to help combat deflation. It established collective bargaining rights, a system of codes to set minimum wages, and to allow collusive pricing. By 1935, over half of all employees were covered by NRA codes (Lyon and others, 1935). Other anti-deflationary policies included an exit from the Gold Standard, and a large fiscal stimulus under the Public Works Administration. The US Supreme Court struck down the NRA codes as unconstitutional in 1935. The results of the NRA are difficult to evaluate, amidst all the other developments, but under the program deflation did end, and industrial production rebounded, with a 55 percent expansion, 1933–35 (Figure 6). Romer (1999) concludes that the NRA played a crucial role in the price reflation.

Figure 6. U.S. CPI Inflation and Industrial Production



The U.S. policy experience during the Great Depression may have lessons for Japan. A coordinated approach between monetary policy (the abandonment of the Gold Standard), fiscal policy (the Public Works Administration), and incomes policy (the NRA), together with significant structural reforms, was effective in ending deflation. Likewise, Cohen-Setton and others (2016) provide evidence from France in the 1930s when the country departed from the gold standard and implemented large-scale mandatory wage increases and hours restrictions. They find that this policy quickly ended deflation, raised inflation expectations, and lowered real interest rates, but that output stagnated. This suggests that a near-term demand stimulus and structural reforms to raise potential growth were needed too.

Generating wage-push inflation is not without risks and success is not guaranteed. For example, firms might increase hiring of non-regular workers, if there are timing and coordination problems, if "comply-or-explain" policies do not deliver sufficient compliance, or if there is the perception by firms or households that policies can be reversed. Possible declines in competitiveness and profitability—especially for labor intensive SMEs and export-oriented companies— could have an adverse impact on employment and growth in the near term. Finally, proposals to increase public wages are likely to encounter political resistance in light of ongoing fiscal consolidation plans.

VI. SIMULATIONS OF THE THREE-ARROWS-PLUS POLICY PACKAGE

In this section, we provide a quantification of the impact of Threes Arrows Plus for Japan, and of the alternative proposals by Krugman, Svensson and Turner. We base our simulation on the Flexible System of Global Models (FSGM) developed by the Research Department of the IMF to analyze country-specific policy simulations in a global context (see Andrle and others, 2015). Additional simulations of the alternative proposals by Krugman, Svensson and Turner are available in the appendices.

The simulations are calculated as deviations from the baseline projections for Japan included in the 2016 Staff Report on Japan (see International Monetary Fund, 2016). Under the baseline scenario, the authorities are assumed to follow the existing policy mix of ¥80 trillion yearly QQE, the same fiscal policy including the increase in the VAT rate to 10 percent in October 2019, and unchanged structural policies.

Under these assumptions, real GDP growth is projected to average 0.5 percent during the forecast period, while inflation remains well below the BoJ target of 2 percent (Table 1). General government net borrowing averages 3.8 percent of GDP a year, resulting in an increase in the net-debt-to-GDP ratio. The current account surplus remains broadly unchanged at around 3.0 percent of GDP. In addition, the real effective exchange rate (REER) is assumed to be unchanged during the projection period.

Table 1. Japan: Baseline Scenario

	2016	2017	2018	2019	2020	2017-20
Real GDP Growth (Year-on-year)	0.5	0.3	0.5	0.8	0.1	0.4
CPI Inflation (Annual average)	0.2	0.6	0.6	1.1	1.7	1.0
General Govt. Net Lending/Borrowing (Percent of GDP)	-5.0	-4.2	-3.9	-3.6	-2.9	-3.7
General Govt. Net Debt (Percent of GDP)	130.4	132.9	134.8	133.8	132.8	133.6
Current Account Balance (Percent of GDP)	3.5	3.0	3.0	2.8	3.1	3.0

Source: International Monetary Fund (2016).

According to the simulations, the Three-Arrows-Plus package (excluding structural reforms) would result in higher growth and inflation than the baseline over the medium term (Figure 5 and Table 2). On average, real GDP growth would be 0.4 percentage point higher over the forecast horizon, while CPI inflation (excluding the effects of the VAT increase) would overshoot the BoJ target of 2 percent by 2019.[9] The output gap would turn positive by 2019, in contrast to the baseline scenario where negative output gaps persist, while policy rates

[9] Monetary policy in the simulations is assumed to target inflation excluding the direct impact of the VAT increase. As a result, the relevant inflation comparison between the scenarios is the one excluding the direct impact of the VAT increase.

would not respond as it is optimal under these circumstances to overshoot the inflation target. The combination of higher real GDP growth, gradual VAT increases, and inflation would put the net-debt-to-GDP ratio on a downward trajectory, which would reduce the term premium marginally as markets would now consider the debt more sustainable (Figure 7). The REER would depreciate moderately, followed by a slight rebound in the outer years. Overall, the proposed policy would end deflation and improve moderately real GDP growth and debt sustainability over the medium term, underscoring that the ambitious targets of Abenomics can still be achieved within a relatively short time frame.

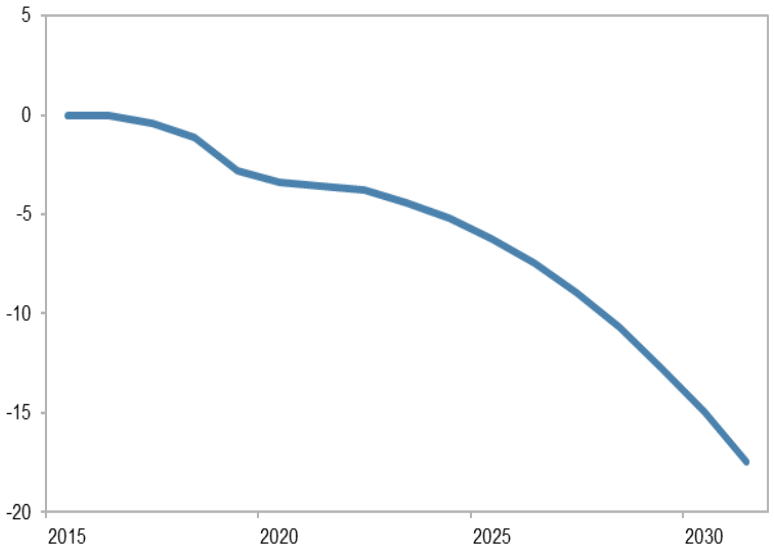
Table 2. Japan: Our Proposed Policy Package

	2016	2017	2018	2019	2020	2017-20
Real GDP Growth (Year-on-year)	0.5	0.8	1.0	1.2	0.3	0.8
CPI Inflation (Annual average)	0.2	1.8	2.2	3.1	2.8	2.4
General Govt. Net Lending/Borrowing (Percent of GDP)	-5.0	-4.5	-4.5	-4.0	-3.5	-4.1
General Govt. Net Debt (Percent of GDP)	130.4	131.9	132.8	129.6	127.9	130.5
Current Account Balance (Percent of GDP)	3.5	3.1	2.9	2.7	3.0	2.9

Source: Authors' simulations

Figure 7. Net Government Debt (2016-30)

(Deviations from baseline, percentage points of GDP)



Source: Authors' simulations.

Overall, structural policies could provide a significant long-term boost to potential output, but its short-term impact is difficult to quantify, given the uncertainty surrounding the private sector response to labor and sectoral reforms. In principle, the fiscal and monetary policy frameworks should be able to keep the economy on the desired growth path, whether or not structural reforms have a contractionary impact in the short run.

According to the simulations, structural reforms could increase potential growth, raising the annual growth rate by about 0.5 percentage point (Table 3).[10] Productivity enhancing and labor market reforms might account for four-fifths of the growth enhancing effect, while changes in incentives and taxes might add to a further 0.1 percentage point to potential growth over the medium term. As a result, we simulated these impacts separately from the rest of the arrows to avoid overstating the impact of the Three-Arrows-Plus policy package in the short run. Having said that, the fourth arrow of structural reforms remains essential to the success of the proposed policy package.

Table 3. Japan: Impact of Structural Reforms on Average GDP Growth
(Percentage point difference over 5 years)

All structural reforms	**0.5**
o.w. productivity enhancing and labor market reforms [1]	0.4
o.w. tax and incentive reforms [2]	0.1

Source: IMF Staff calculations.
1. Product market reforms, changes in employment protection legislation, child care reform, active labor market policies, unemployment benefit replacement reforms.
2. Tax and pension reforms.

One possible criticism of the proposed policy package is that inflation could respond more slowly to incomes policy than foreseen under the scenarios. This could arise from employers squeezing their margins in order to accommodate the wage increases, without raising prices one-to-one. We have simulated a slower response to the incomes policy in Appendix V, where we show that a response lag of one or two years does not cause any substantial differences to the simulations as long as the proposed policy package is credible. It would take longer to achieve the 2 percent inflation target than under the scenario shown in Figure 7 and Table 2, implying a slower decline in the debt-to-GDP ratio. However, the improvement in growth and inflation would still materialize over the medium term.

A comparison with other proposals shows that Three Arrows Plus is more likely to mitigate the risk of an adverse response of the private sector. Krugman's proposal is clearly superior to our proposal if financial markets do not adjust their expectations of future inflation (Appendix II). However, if markets respond through a higher term premium of 2 percentage points (similar to the term premium shock in the 2000s), the debt path becomes explosive, implying a worse outcome. Svensson's Foolproof Way would require close coordination between the BoJ and the MoF to manage the initial depreciation and the crawling peg, (Appendix III). Assuming that this close coordination is possible, the Foolproof Way would necessitate an upfront depreciation of the currency to end deflation, despite that fact that the

[10] Based on the *IMF-OECD-WBG* G-20 Macroeconomic Reform Priorities Report scenario and translated into our model by using Bouis, R. and others. (2012).

Japanese economy is a relatively closed economy, provided the regime change is fully credible. If not, the depreciation would likely need to be larger, which may be seen as a "beggar-thy-neighbor" policy or currency manipulation by trading partners and could result in higher term premiums that would partly offset the benefit of the depreciation. Turner's proposal to monetize the debt would get the Japanese economy out of deflation (Appendix IV), provided consumers realize that the additional government spending would not come with higher taxes down the road. The risk, however, would be that politicians may use this as a way to avoid the painful fiscal consolidation by delaying necessary VAT increases. The private sector may lower its consumption in response to the heightened uncertainty about the timing of future tax hikes. In addition, the private sector may respond to the monetization of the fiscal deficit by ratcheting up its inflation expectations, thus unhinging the inflation targeting regime.

VII. POLICY CONCLUSIONS

In this paper, we have proposed a comprehensive policy package to end deflation in Japan. The policy package, which we call *Three Arrows Plus*, reinforces the authorities' current three-arrow approach, which consists of fiscal stimulus, monetary easing, and structural reform. We propose, first, to bring the three arrows together in a coherent and comprehensive package. We argue that both monetary and fiscal policies have to be embedded in long-term frameworks that deal with uncertainty and anchor private sector expectations about the behavior of inflation and public debt, over the long run. Second, we propose, to add incomes policy—an extra arrow, so to speak. Such a program helped end deflation in the United States in the 1930s. We show through a series of simulations how the Three Arrows Plus package may be more likely to succeed than some well-known alternative proposals, as it better mitigates the risk of adverse responses from the private sector.

The policy challenge to end deflation in Japan is formidable. As shown by the experience over the last 25 years, a separate instruments' approach will not succeed. It is essential instead to use multiple coordinated instruments in a framework that over time ensures stability of inflation and a sustainable path of government debt.

References

Alichi, A., J. Benes, J. Felman, I. Feng, C. Freedman, D. Laxton, E. Tanner, D. Vavra, and H. Wang (2015a), "Frontiers of Monetary Policymaking: Adding the Exchange Rate as a Tool to Combat Deflationary Risks in the Czech Republic," IMF Working Paper No. 15/74.

———, K. Clinton, C. Freedman, O. Kamenik, M. Juillard, D. Laxton, J. Turunen, and H. Wang (2015b), "Avoiding Dark Corners: A Robust Monetary Policy Framework for the United States," IMF Working Paper No. 15/134.

Andrle, M., P. Blagrave, P. Espaillat, K. Honjo, B. Hunt, M. Kortelainen, R. Lalonde, D. Laxton, E. Mavroeidi, D. Muir, S. Mursula, S. Snudden, 2015, "The Flexible System of Global Models – FSGM," IMF Working Paper No. 15/64.

Aoyagi, C. and G. Ganelli, 2013, "The Path to Higher Growth: Does Revamping Japan's Dual Labor Market Matter?", IMF Working Paper No. 13/202.

Aso, T., 2015, Speech on Fiscal Policy by Minister of Finance Aso at the 189rd Session of the National Diet, February 12, 2015, available at http://www.mof.go.jp/english/public_relations/statement/fiscal_policy_speech/e20150212.html

Bank of Japan, 2016, Outlook for Economic Activity and Prices, Bank of Japan, April 29, 2016

Bernanke, B. S., 2003, "Some Thoughts on Monetary Policy in Japan," Remarks before the Japan Society of Monetary Economics, Tokyo, Japan, May 31, 2003, available at http://www.federalreserve.gov/BOARDDOCS/SPEECHES/2003/20030531/default.htm

Blanchard, O., 2014, "Where Dangers Lurk," in International Monetary Fund *Finance & Development*, September 2014, Vol. 51, No. 3.

Buiter, W. H., 2014, "The Simple Analytics of Helicopter Money: Why It Works – Always", in *Economics*, Vol. 8, 2014-28, August 2014.

Caballero, R. J. Takeo, H. Kashyap, A.K., 2008, "Zombie Lending and Depressed Restructuring in Japan", in *American Economic Journal* , Vol. 98(5), 1943–77, January 2008.

Clinton, K., C. Freedman, M. Juillard, O. Kamenik, D. Laxton, and H. Wang, 2015, " Inflation-Forecast Targeting: Applying the Principle of Transparency," IMF Working Paper No. 15/132.

Cohen-Setton, J., J.K. Hausman, and J.F. Wieland, 2016, "Supply-Side Policies in the Depression: Evidence from France," NBER Working Paper 22140.

Ganelli, G. and N. Miake, 2015, "Foreign Help Wanted: Easing Japan's Labor Shortages," IMF Working Paper No. 15/181.

Galì, J.,2014, "The Effects of a Money-Financed Fiscal Stimulus," Universitat Pompeu Fabra and Barcelona, available at http://crei.cat/people/gali/gmoney.pdf

Hara, N., N. Hirakata, Y. Inomata, S. Ito, T. Kawamoto, T. Kurozumi, M. Minegishi, and I. Takagawa, 2006, "The New Estimates of Output Gap and Potential Growth Rate," Bank of Japan Review No. 2006-E-3

International Monetary Fund, 2015, *Japan: 2015 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for Japan*, IMF Country Report No. 15/197.

———, 2016, *Staff Report - Japan*: Washington, D.C., forthcoming.

Ito, T., 2015, Remarks at the International Monetary Fund Japan Round Table, "Is Abenomics Working," October 19, 2015 (unpublished).

Krugman, P., 2015, "Rethinking Japan," in *The New York Times*, October 20, 2015, available at http://mobile.nytimes.com/blogs/krugman/2015/10/20/rethinking-japan/

Kuroda, H., 2015, "Challenges to Achieving the Price Stability Target of 2 Percent," Speech at a Meeting Held by the Naigai Josei Chosa Kai (Research Institute of Japan) in Tokyo, November 6, 2015, available at http://www.boj.or.jp/en/announcements/press/koen_2015/ko151106a.htm/

Kwon, H. U. Narita, F. Narita, M., 2015, "Resource Reallocation and Zombie Lending in Japan in the 1990s," in *Review of Economic Dynamics*, Vol. 18(4), 709–32, October 2015.

Lyon L.S., P. T. Homan, L. L. Lorwin, G. Terborgh, C.L. Dearing, L. Marshall C. 1935, *The National Recovery Administration: An Analysis and Appraisal*. Brookings Institution.

McCallum, B. T., 2003, "Japanese Monetary Policy, 1991–2001," in Federal Reserve Bank of Richmond *Economic Quarterly*, Vol. 89/1, Winter 2003.

Porcellachia, D., 2016, "Wage-Price Dynamics and Structural Reforms in Japan," IMF Working Paper 16/20.

Romer, C.D., 1999, "Why Did Prices Rise in the 1930s?" The Journal of Economic History, 59, pp 167–99.

Shibata, I., 2013, "Is Labor Market Mismatch a Big Deal in Japan?" IMF Working Paper No. 13/196.

Svensson, L., 2000,. "The Zero Lower Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap," NBER Working Paper 7957.

Statistical Bureau of Japan, 2011, "2010 Japan Census," October 26, 2011, available at http://www.stat.go.jp/english/data/kokusei/pdf/20111026.pdf

Steinberg, C. and M. Nakane, 2011, To Fire or to Hoard? Explaining Japan's Labor Market Response in the Great Recession," IMF Working Paper No. 11/15

Turner, A., 2015, "The Case for Monetary Finance – An Essentially Political Issue", paper presented at the IMF 16th Jacques Polak Annual Research Conference, November 2015, available at http://www.imf.org/external/np/res/seminars/2015/arc/pdf/adair.pdf

Appendix I. The Model and the Three-Arrows-Plus Baseline

All simulations in this paper are based on the Fund's Flexible System of Global Models (FSGM).[1] Each FSGM module is an annual, multi-region, general equilibrium model of the global economy combining a mix of micro-founded and reduced-form formulations of the various economic sectors. Each country/regional block is structurally similar, but each has its own steady-state ratios and behavioral parameters.

In the FSGM module for Japan, real GDP is determined by the sum of its demand components in the short run, and the level of potential output in the long run. The key price level, the consumer price index (CPI), is modeled by a Phillips curve.

Consumption is determined partly by forward-looking households based on the Blanchard-Weil-Yaari overlapping generations (OLG) model. OLG households take into account the expected path for government debt. In their savings decisions, they treat government bonds as wealth since there is a belief that the associated tax liabilities will fall on future generations. Saving is based also on domestic labor income, the private business capital stock, and net foreign assets denominated solely in U.S. dollars. Consumption dynamics are driven too by liquidity-constrained (LIQ) households. They do not have access to financial markets, do not save, and thus consume all their income each period. This feature amplifies the non-Ricardian properties of the model.

Private business investment is modeled on an extended version of Tobin's Q. Investment is negatively correlated with real interest rates, and positively with the output gap (a financial accelerator type mechanism). Firms choose their capital stock to maximize their profits.

The government spends on consumption and infrastructure, and on transfers to households. Infrastructure investment enhances productivity– for example, through improved transportation links.

The government chooses a long-run level of debt relative to GDP. In order to meet the debt target, under the standard fiscal reaction function in the model, the government adjusts lump-sum transfers.

The model tracks aggregate exports and imports, and their oil, metals and food components. Exports increase with foreign activity, and imports with domestic activity. Relative international prices, incorporating exchange rate changes, affect both exports and imports.

---

[1] Andrle, M. and others (2015), "The Flexible System of Global Models — FSGM," IMF Working Paper No. 15/64.

Potential output is based on Cobb-Douglas production technology with trend total factor productivity, the steady-state labor force, the non-accelerating inflation rate of unemployment (NAIRU), and the actual capital stock.

The rate of increase in the core price index (CPIX) is determined by a Phillips curve. As well as the output gap, and expected inflation, the equation contains pass-through from the exchange rate, and from oil and food prices. Wage inflation adjusts such that the real wage returns to its equilibrium gradually, at a rate depending on the expected evolution of overall economic activity.

Monetary policy is represented by an interest rate reaction function, based on an inflation-forecast-based rule. The 10-year Japanese government bond interest rate is determined by the expectations theory of the term structure, plus a term premium.

Assumptions for Simulating the Three-Arrows-Plus Policy Package

The numerical assumptions for monetary, fiscal and incomes policies are listed in Table I.1. These assumptions establish a baseline for comparison with alternative policy proposals. Structural reforms are modeled separately.

In the simulation for Three Arrows Plus, we include another round of Quantitative and Qualitative Easing (QQE) by the Bank of Japan. We assume that the additional purchases of long-term government bonds (quantitative easing) by the Bank of Japan compress long-term yields, i.e. the term premium decreases. The unconventional monetary policy is solely captured by its impact on premia, as monetary aggregates are not explicitly modeled in the model. In addition, we assume that by purchasing corporate bonds (qualitative easing), the BoJ can compress the corporate risk premium too. In accordance with monetary easing, the monetary policy rate was held fixed at the ELB throughout the exercise for the whole simulation period.

Fiscal policy under Three Arrows Plus involves a gradual VAT rate increase. We assume annual increases of 0.5 percentage points, such that the VAT tax rate reaches 15 percent in 2030. This is assumed to be preannounced and fully anticipated by all agents in the economy. In order to offset negative aggregate demand consequences of the VAT-hike, and to help with the achievement of the inflation target, we add an incomes policy with a gradual increase in public wages, and a temporary increase in transfers to liquidity-constrained households.

The incomes policy is modeled through shocks to expectations of both price and wage inflation. The shocks are calibrated such that core inflation (CPIX) inflation is higher by around 1 percentage point in the first year. In line with the proposed incomes policy, the shock corresponds to an initial boost to real wages, as productivity increases are factored into wage setting behavior. We also simulated a scenario where price inflation adjusts slowly to the Three-Arrows-Plus package (Appendix V).

Table I.1. Assumptions for Simulating the Three-Arrows-Plus Policy Package

	2017	2018	2019	2020	2021-
Monetary Policy:					
Term premium (basis points difference)	-10	-15	-20	-10	Decays with AR=0.6
Corporate risk premium (basis points difference)	-1.7	-8.3	-8.3	-8.3	Decays with AR=0.6
Short-term policy rate	Fixed at baseline 2017-2022				
Fiscal policy:					
VAT	0.5pp rise every year in 2017-2030, end tax rate=15%				
Targeted transfers (% of baseline GDP)	0.8	1.6	1.5	1.4	0.9, then 0
Incomes policy:					
Inflation expectations shock 1/	0.9	1.1	1.8	1.5	1.2 then 0
Wage inflation expectations shock 2/	0.9	1.6	2.3	1.8	1.2 then 0
With slow inflation adjustment:					
As above except for					
Incomes policy:					
Inflation expectations shock 1/	0.2	0.7	1.7	1.3	1.1 then 0
Wage inflation expectations shock 2/	0.8	1.4	2.2	1.1	0.8 then 0

Source: Authors' assumptions.

1/ Impact of inflation expectations shocks on core inflation (net of the impact of VAT).

2/ Impact of wage inflation expectations on wage inflation.

Appendix II. Krugman's Irresponsible Fiscal and Monetary Policy

Krugman (2015) argues that Japan should pursue a period of Irresponsible Fiscal and Monetary Policy to deal with the ELB constraint. In order to assess the merits of Krugman's argument, this appendix presents the results of a simulation where the Japanese authorities follow expansionary fiscal and monetary policies over the period 2017–21.

For the model simulations, the Irresponsible Fiscal and Monetary Policy is represented by a fiscal stimulus that results in a transitory deviation from a debt stabilization policy. Specific assumptions are listed in Table II.1. The assumed fiscal shock builds up gradually: 2 percent of GDP in year 1, 4 percent year 2; and 5 percent in years 3 and 4. The increased government spending is equally distributed across public infrastructure investment, targeted fiscal transfers, and government purchases of goods and services.

The irresponsible monetary policy keeps the BoJ policy rate fixed at the current level of zero for five years. This implies a significant departure from the inflation target of 2 percent. Beyond 2020, monetary policy reacts to higher output gap and inflation in order to get inflation back to target, and to provide the long-run nominal anchor that the economy, as well as the model, needs.

Table II.1. Assumptions for Krugman's Irresponsible Fiscal and Monetary Policy

	2017	2018	2019	2020	2021-
Monetary Policy:					
Term premium (basis points difference)	-10	-15	-20	-10	Decays with AR=0.6
Corporate risk premium (basis points difference)	-1.7	-8.3	-8.3	-8.3	Decays with AR=0.6
Short-term policy rate	Fixed at baseline 2017-2022				
Fiscal policy:					
VAT	as in the baseline				
Targeted transfers (% of baseline GDP)	0.7	1.3	1.7	1.7	1.7 then 0
Public investments (% of baseline GDP)	0.7	1.3	1.7	1.7	1.7 then 0
Inflation expectations shock 1/	0.7	1.3	1.7	1.7	1.7 then 0
Wage inflation expectations shock 2/					
As above except for:					
Rise in term premium by 100 basis points					
Term premium (basis points difference)	100	100	100	100	100 with decay of AR=0.75
Inflation expectations shock 1/					
Wage inflation expectations shock 2/	200	200	200	200	200 with decay of AR=0.75

Source: Authors' assumptions.

1/ Impact of inflation expectations shocks on core inflation (net of the impact of VAT).

2/ Impact of wage inflation expectations on wage inflation.

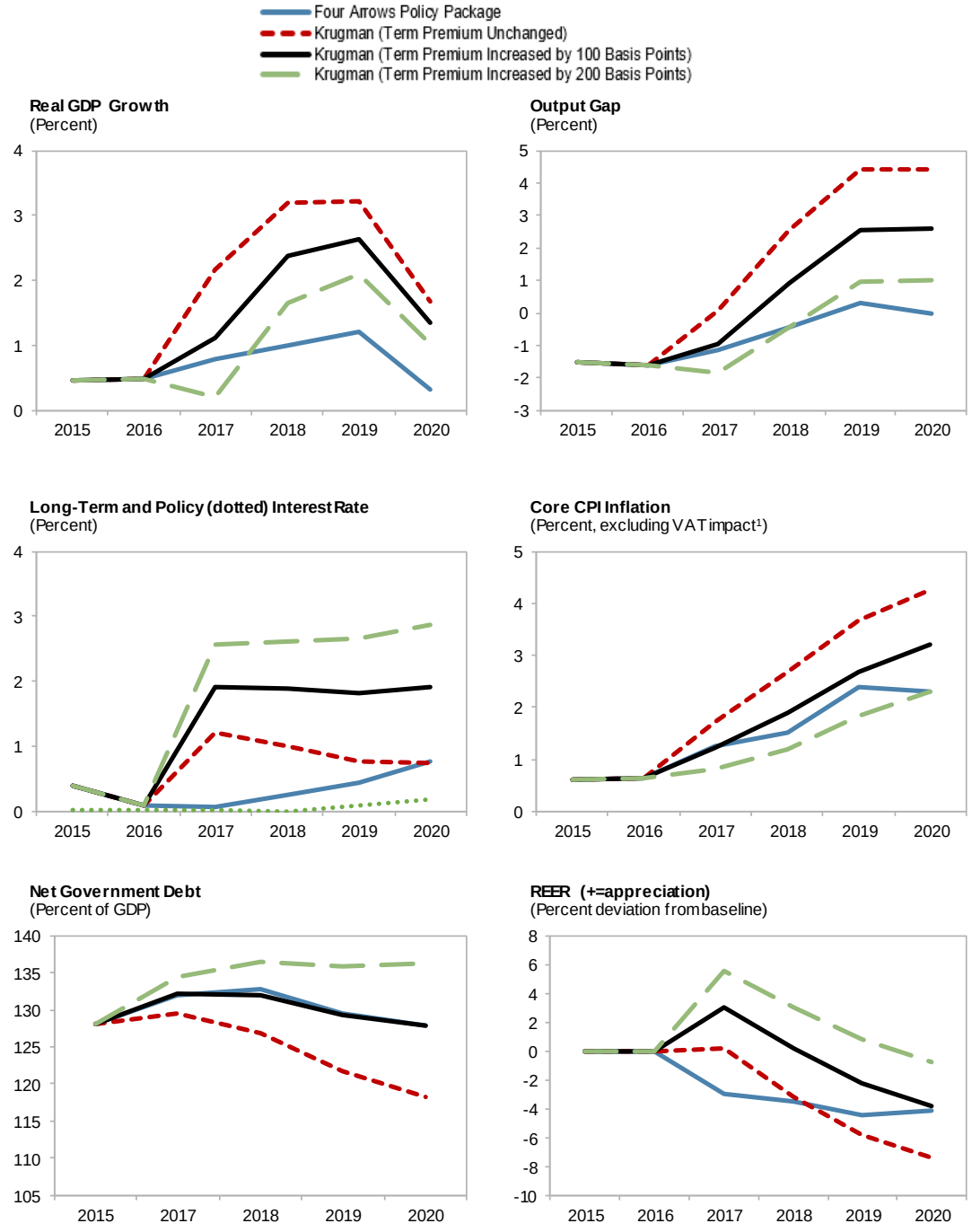
The results of these simulations are shown in Figure II.1. As expected, Irresponsible Fiscal and Monetary Policy leads to higher real GDP growth and inflation. Since government debt is assumed to be financed through long-dated maturity debt at fixed nominal rates, real interest payments and real expenditures on cyclical components drop. Given the faster increase in nominal GDP growth, the net government debt-to-GDP ratio falls over the medium term. The REER depreciates faster than under our proposed policy package.

This scenario, however, is not without considerable risk, stemming from market expectations of debt sustainability and future inflation. In particular, we assume that financial markets do not adjust their expectations, such that real interest rates decline, as envisaged by Krugman. However, if financial markets anticipate higher debt and inflation in the future, this will result in higher long-term nominal interest rates.

We illustrate these risks with two alternative scenarios of a 100 and 200 basis points increase in the difference between short- and long-term interest rates (the term premium) over the forecast horizon. The assumed increases in the term premium are within the actual range of variation over the period 1990–2015. Higher term premiums feed into higher cost of lending for both households and the nonfinancial corporate sector. As a consequence, consumption and investment are lower. Smaller output gaps and higher unemployment create less inflationary pressures. Even without a policy reaction from the central bank, the fiscal boost is therefore offset by the drop in private demand. As a result, if the term premium rises by 100 basis points, net government debt as a percentage of GDP eventually ends up at the same level as in the proposed policy package by 2021. If the term premium rises by 200 basis points, the debt path becomes explosive, while the REER appreciates first due to higher long-term interest rates. So, the exchange rate becomes a shock amplifier rather than a shock absorber.

Based on these results, we conclude that Krugman's proposal critically depends on market expectations of future taxes and higher inflation. If market expectations remain unchanged, Krugman's proposal has a more favorable outcome than our proposal. However, if market expectations adjust to higher future inflation through an increase in the term premium, the positive impact from higher inflation is offset by higher long-term nominal interest rates, keeping real rates unchanged or higher.

Figure II.1 Simulations of Krugman's Irresponsible Fiscal and Monetary Policy



Source: Authors' simulations.
1 Direct VAT impact is 0.3 and 1.0 percent in the Krugman scenarios for 2019 and 2020, respectively. Direct VAT impact in the Three-Arrows-Plus Policy Package is 0.4 percent for 2017 and 0.5 percent thereafter.

Appendix III. Svensson's Foolproof Way

Svensson (2000) argued that Japan could end deflation by following a Foolproof Way of escaping from a liquidity trap. This policy consists of a credible commitment to price level path targeting (PLPT); exchange market intervention; measures to maintain low long-term interest rates (e.g. forward guidance, central bank long-term bond purchases); and a return to flexible inflation targeting once the PLPT is achieved.

PLPT, if implemented credibly, guarantees that inflation *on the average* will be close to target. The policy has memory: it will react to a negative deviation that emerges in one period by targeting a positive deviation in a future period. To capture this response, we insert the deviation from the target path for the price level in the monetary policy reaction function, with a coefficient of 0.05 (Table III.1).

Table III.1. Assumptions for Simulating Svensson's Foolproof Way

	2017	2018	2019	2020	2021-
Monetary Policy:					
Price level target coefficient	0.05	0.05	0.05	0.05	0.05
Long term price level target	Gradually reaching 10 percent higher target price level				
Short-term policy rate	Fixed at baseline 2017-2022				
FX premium	0.6	0.4	0.3	0.1	-0.5 with decay of AR=0.75
With rise in term premium:					
As above except for					
Long-term price level target	Gradually reaching 5 percent higher target price level				
Inflation expectations shock 1/	0.5	0.4	0.4	0.4	0.4 with decay of AR=0.75

Source: Authors' assumptions.

1/ Impact of inflation expectations shocks on core inflation (net of the impact of VAT).

2/ Impact of wage inflation expectations on wage inflation.

If market participants firmly expect a higher future price level, the nominal exchange rate depreciates immediately. This would be supported if necessary under the Svensson program by official market intervention. To represent such an effect in the simulations, we add a shock the FX premium.

The PLPT serves to help raise inflation expectations temporarily above longer-term inflation objectives, while preventing long-term inflation expectations from ratcheting upwards. The higher inflation expectations over the medium term will reduce real interest rates, and hence stimulate domestic demand, provided that the BoJ can employ other measures to maintain low nominal longer-term interest rates.

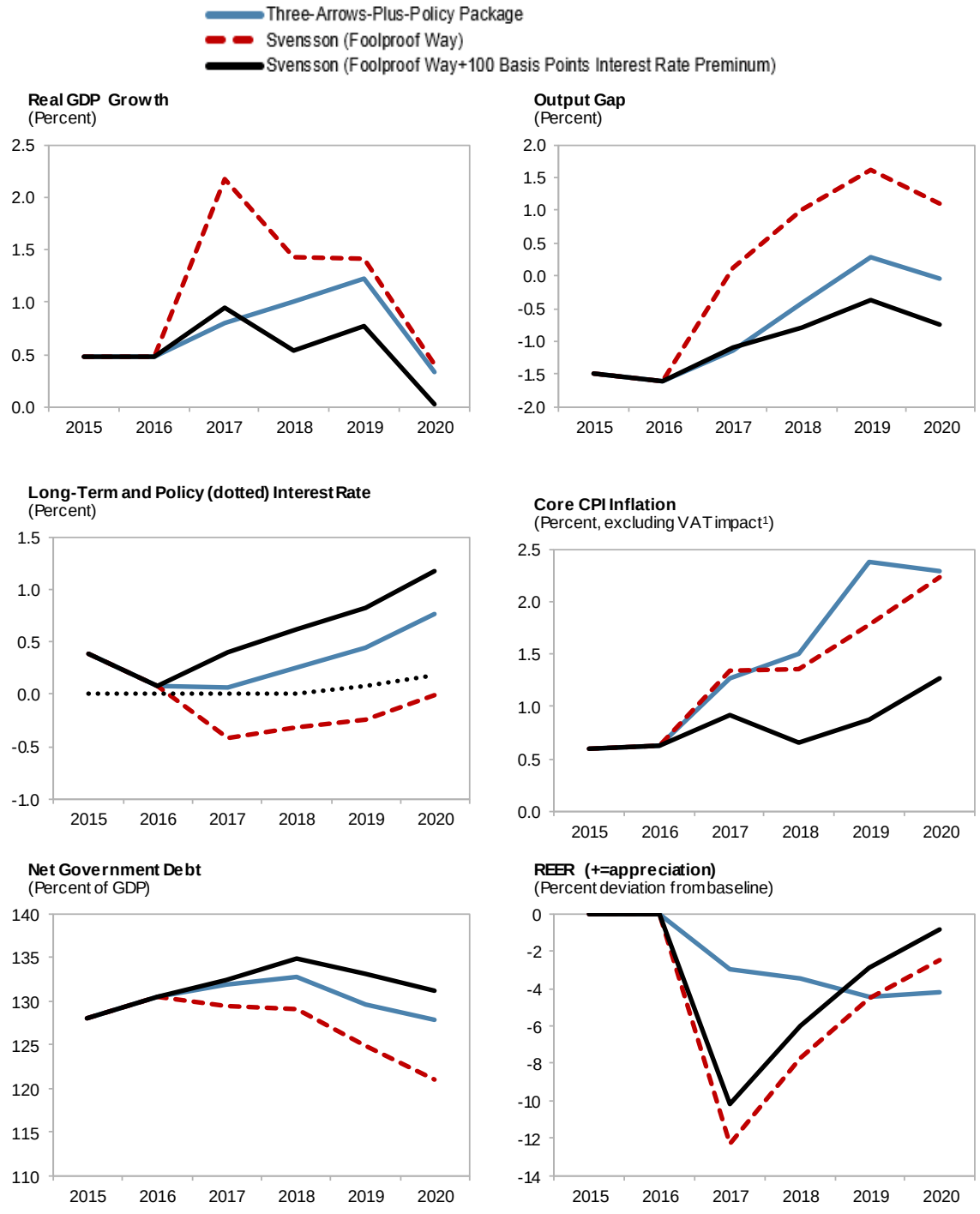
In contrast to Krugman's Irresponsible Fiscal and Monetary Policy (Appendix II) and Turner's Monetization of the Deficit (Appendix IV), this policy does not constitute a major departure from a flexible inflation targeting framework. Its distinctive feature is to use the exchange rate as an instrument to achieve the PLPT path. As the economy exits deflation, monetary policy is assumed to go back to inflation targeting using the short-term interest rate as the main instrument to manage the short-run inflation-output trade-off.

The results of these simulations are shown in the red line in Figure III.1. As expected, the Foolproof Way also leads to an overshoot in inflation. The depreciation in the currency and the measures to maintain low longer-term real interest rates generate a 1.5 percent positive output gap. If the PLPT path is credible, both inflation and wage inflation expectations gradually adjust. The depreciation and the reduction in real interest rates help to jolt the economy out of deflation, Lower interest rates and higher tax revenues put the government debt-to-GDP ratio onto a gradually decreasing path.

Compared to our proposed policy package, the Foolproof Way delivers higher output, lower net debt and a slightly smaller inflation overshoot if long-term rates do not adjust to expected higher nominal interest rates.

However, this result is crucially dependent on how long-term interest rates evolve. We consider an alternative scenario where the BoJ aims for a more gradual increase in inflation, and where the special measures fail to prevent a rise in long-term interest rates. In this case, much of the positive impact of Svensson's Foolproof Way fades: the outcome is lower inflation and higher debt than under our proposal (Figure II.1).

Figure III.1. Simulations of Svensson's Foolproof Way



Source: Authors' simulations.
1 Direct VAT impact is 0.3 and 1.0 percent in the Svensson scenarios for 2019 and 2020, respectively. Direct VAT impact in the Three-Arrows-Plus Policy Package is 0.4 percent for 2017 and 0.5 percent thereafter.

Appendix IV. Turner's Monetization of the Deficit

Turner (2015) proposes to monetize a portion of the fiscal deficit in Japan. He argues that Japan should consider a policy of running a higher fiscal deficit, which is financed by an irredeemable, non-interest-bearing asset of the government to the central bank.[1] Technically, this financing could be performed in three ways: (a) a direct credit from the central bank to the government's current account, (b) an interest-bearing debt issued by the government, which the central bank purchases and then converts to a non-interest-bearing non-redeemable asset; or (c) through the issuance of interest-bearing debt which the central bank perpetually rolls over while remitting to the government as profit the interest income it receives from the government. Non-technically, these measures amount to financing the budget deficit by issuing central bank money.

Monetization of the deficit could be extended, to the monetization of existing government debt at the central bank as well. Trial simulations, however, reveal little difference in macroeconomic effects. This is because the dominant channel of transmission is through the direct injection of money-financed deficit spending.

We analyze the benefits and risks of the proposal by simulating an amended version of the FSGM. In this scenario, the Japanese authorities follow expansionary fiscal and monetary policies over the period 2017–21, and the additional fiscal deficit is financed by money creation (Table IV.1). By construction, in the model, interest-bearing debt is not affected by the additional fiscal stimulus: we introduce instead an irredeemable non-interest bearing liability (money) to finance the increased budget deficit. For comparability with Krugman's Irresponsible Fiscal and Monetary Policy, we assume the same fiscal stimulus as in Appendix II. Beyond 2022, fiscal policy reverts back to the non-money financing setup once the economy is out of the ELB and the liquidity trap.

[1] Bernanke (2003), Buiter (2014) and Gali (2014) also propose similar policies.

Table IV.1 Assumptions for Simulating Turner's Monetization of the Deficit

	2017	2018	2019	2020	2021-
Monetary Policy:	Finances deficit through money creation and normalizes after 2021				
Short-term policy rate	Fixed at baseline 2017-2021				
Fiscal policy:					
VAT	as in the baseline				
Targeted transfers (% of baseline GDP)	0.7	1.3	1.7	1.7	1.7 then 0
Public investments (% of baseline GDP)	0.7	1.3	1.7	1.7	1.7 then 0
Public consumption (% of baseline GDP)	0.7	1.3	1.7	1.7	1.7 then 0
With inflation scare:					
Term premium shock (basis point differences)	400	400	400	400	400 with decay of AR=0.75
Inflation expectations shock 1/	1	1	1	1	1 then 0
Wage inflation expectations shock 2/	1	1	1	1	1 then 0
With inflation scare and BoJ response:					
Term premium shock (basis point differences)	400	400	400	400	400 with decay of AR=0.75
Inflation expectations shock 1/	1	1	1	1	1 then 0
Wage inflation expectations shock 2/	1	1	1	1	1 then 0
Short-term policy rate	Fixed at baseline for 2017-19, then following an inflation-forecast targeting rule				

Source: Authors' assumptions.

1/ Impact of inflation expectations shocks on core inflation (net of the impact of VAT).

2/ Impact of wage inflation expectations on wage inflation.

Throughout the projection period, in line with the reflation objective, the BoJ keeps its policy rate at the ELB. As with Krugman's scenario, this implies a significant departure from the inflation target of 2 percent. As the economy departs from the ELB, monetary policy eventually starts reacting to the higher output gap and inflation in order to get inflation back to target.

The results of these simulations are shown in Figure III.1. Monetization of the Deficit does stop deflation, and boost real GDP growth. As the fiscal stimulus is assumed to be financed by non-interest bearing debt, nominal interest payments remain constant and the real debt burden therefore falls. Higher nominal income leads to higher (nominal) tax revenues. The net government debt-to-GDP ratio falls over the medium term by around 30 percentage points, despite the fiscal expansion. The REER depreciates to provide an additional stimulus to the economy.

Overall, Turner's proposal would give a stronger boost to the economy than Three Arrows Plus. However, it implies a significant departure from the existing monetary policy framework, under which the official BoJ inflation target of 2 percent in principle provides a nominal anchor. This means more uncertainty. The major risk stems from market expectations of higher inflation, as the commitment from the authorities not to resort again to monetary financing may not be credible. It may also be the case that politicians start using the monetary financing of the deficit as an excuse to delay fiscal consolidation (e.g., VAT increases). In other words, market participants might expect another fiscal stimulus in the future, again financed by monetary expansion. This gives rise to the specter of "fiscal dominance," where the financing needs of the government override the inflation control objective of the central bank. An inflation scare would be more protracted if this type of policy lacks a proper long-term macroeconomic framework. It would result in higher long-term nominal interest rates, through an increase in the term premium and a ratcheting up of inflation expectations.

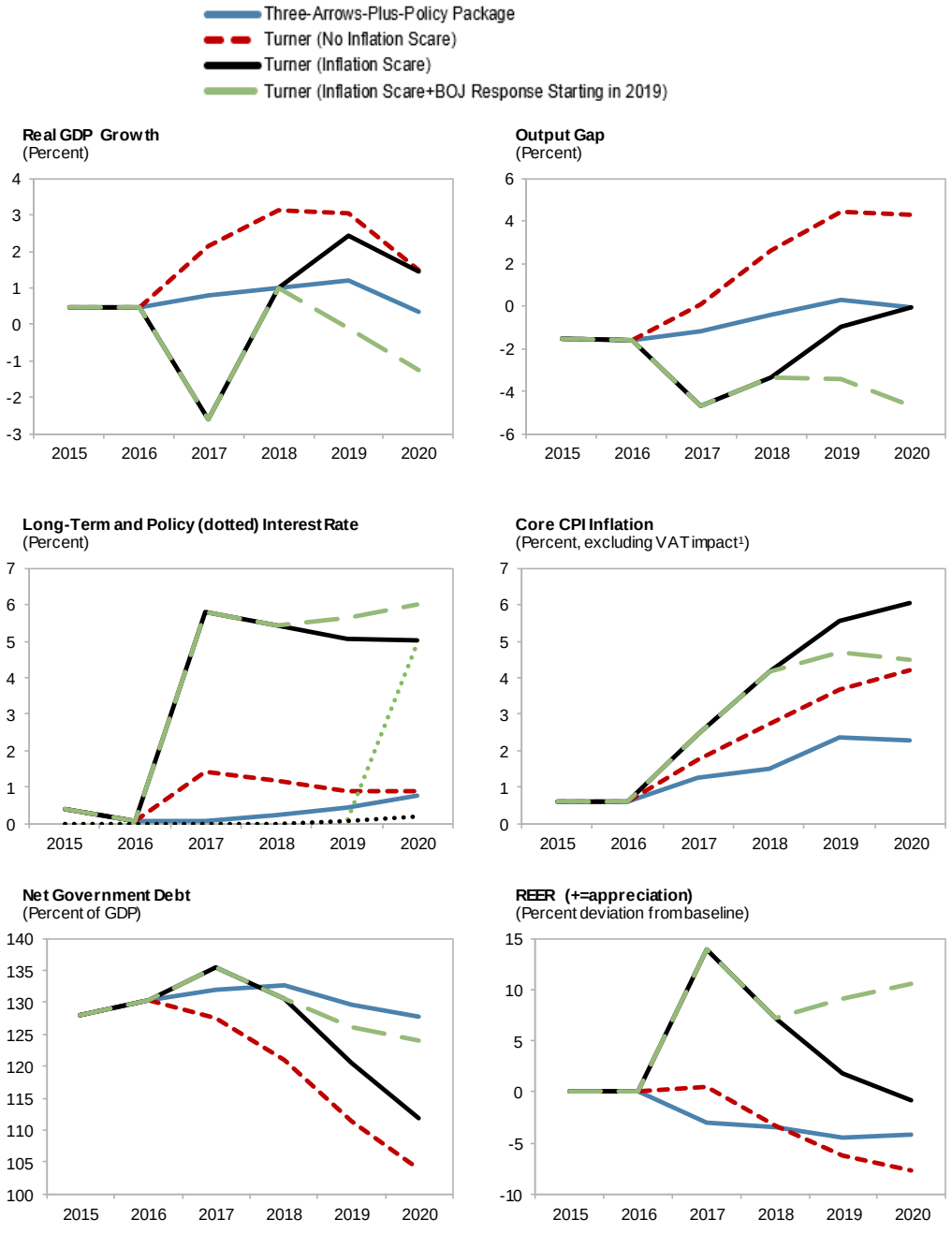
Moreover, it is also reasonable to assume that under this policy scenario the rise in the term premium is more likely and might be more protracted than in other scenarios. The reasons are the policy uncertainty mentioned above, the fact that the probability of a substantial inflation overshoot, while low, is nonzero, creating the potential for a "peso problem" and last, but not least the lack of emphasis on strengthening policy frameworks, especially a credible path to raise the consumption tax rate gradually over time, which will be essential to mitigate the risks of an adverse market reaction. In other words, the challenge of calibrating and fine-tuning the monetary financing in a high debt environment could trigger policy uncertainty and a considerable rise in the term premium. The central bank would then need to tighten, to bring inflation expectations back under control.

We illustrate these risks with two alternative scenarios. In both, we assume the inflation scare to translate in a 400 basis points increase in the term premium and a 1 percentage increase in inflation expectations. The two alternative scenarios differ to the extent that a) the BoJ does not respond to the inflation scare; and (b) the BoJ does respond, starting in 2019. In both scenarios, the inflation scare does not directly feed into higher interest rate payments of the government, but has a considerable impact on the rates faced by the private sector (both households and the nonfinancial corporate sector). As a consequence, both private investment and consumption are lower than in the scenario without higher term premiums. Lower output gaps and higher unemployment create less inflationary pressures. In the scenario where monetary policy reacts after 2019, lending rates rise even more sharply and the anti-inflationary monetary policy eventually leads to a drop in output and consumption, together with an appreciation of the REER. The net government-debt ratio still ends up at a lower level, compared to the Three-Arrows-Plus package. But inflation substantially exceeds the target for a more prolonged period, and output growth is lower, and less stable.

Turner's proposal for monetization of the fiscal deficit therefore critically depends on market expectations of future inflation, and how monetary policy would handle these risks. If market

expectations remain unchanged, Monetization of the Deficit implies significantly lower debt and higher output and inflation than Three Arrows Plus. However, if market expectations adjust to higher future (fiscally-induced) inflation through an increase in the term premium, and monetary policy then pursues an anti-inflationary policy, the macroeconomic costs might well offset the benefits of lower interest-bearing debt.

Figure VI.1. Turner's Monetization of the Deficit



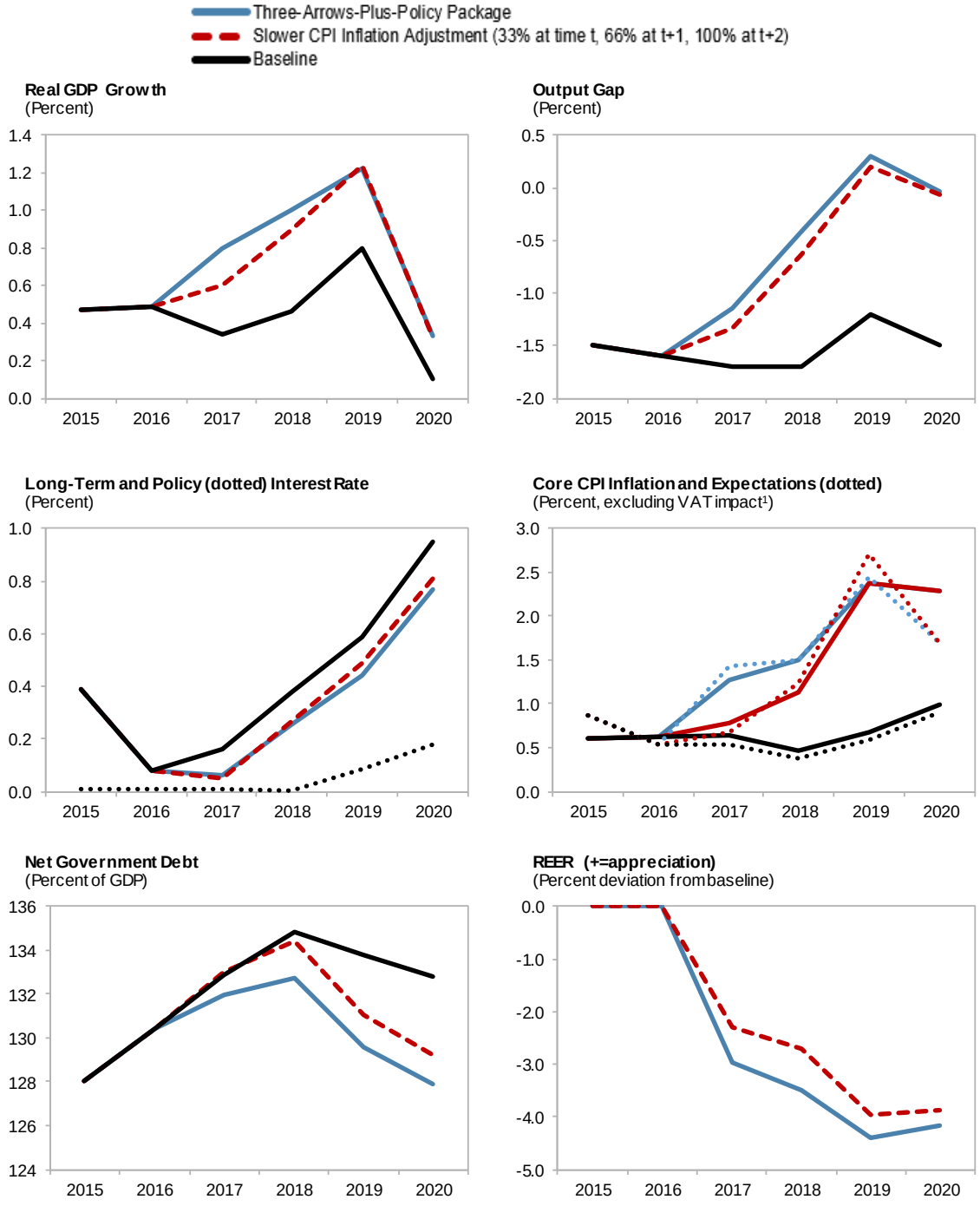
Source: Authors' simulations.
1 Direct VAT impact is 0.3 and 1.0 percent in the Turner scenarios for 2019 and 2020, respectively. Direct VAT impact in the Three-Arrows-Plus Policy Package is 0.4 percent for 2017 and 0.5 percent thereafter.

Appendix V. Slow Inflation Response to Incomes Policy

The assumption under the proposed policy package is that CPI inflation responds contemporaneously to incomes policy. This Appendix investigates the sensitivity of our results to the relaxation of this assumption. This slower adjustment may reflect that firms may initially compress their margins to absorb the cost of higher wage bills, in order to maintain competitiveness. Specifically, we run the following scenario where CPI inflation reflects 33 percent of the wage inflation at time t, 66 percent at t+1, and 100 percent only at time t+2 and after.

The results are similar to our standard policy package, but with some delay in the adjustment process. As it now takes longer for the economy to exit deflation, the increase in real GDP through higher private investment and net exports is delayed. This slower expansion in domestic demand is, however, partly compensated by a rise in real wages, as wage inflation now rises faster than price inflation. This leads to slightly higher consumption expenditures compared to the benchmark policy package. The real exchange rate responds in a similar fashion, with an initial small depreciation followed by a slight appreciation in the outer years. Overall, aggregate demand expands by less than if CPI inflation adjusts contemporaneously to wage inflation. The slower GDP and inflation dynamics translate into a slower nominal GDP growth than under the proposed policy package, and hence a smaller reduction in the debt-to-GDP ratio.

Figure V.1 Slower Adjustment of CPI Inflation to Incomes Policy



Source: Authors' simulations.
1 Direct VAT impact is 0.3 and 1.0 percent in the Baseline scenario for 2019 and 2020, respectively. Direct VAT impact in the Three-Arrows-Plus Policy Package and in the Slower CPI Inflation Adjustment is 0.4 percent for 2017 and 0.5 percent thereafter.