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## Abenomics: An update

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# ABENOMICS: AN UPDATE

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## Abstract

We update the evaluation and outlook for Abenomics in [Hausman and Wieland \(2014\)](#). Abenomics, and expansionary monetary policy in particular, continued to weaken the yen and raise stock prices in 2014. It also continued to generate positive inflation, though neither actual nor expected inflation are yet 2%. Real effects of Abenomics have been modest. The response of net exports to the weak yen was small, and there is little evidence that expansionary monetary policy had large effects on consumption.

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# 1 Introduction

Shinzo Abe took office as prime minister of Japan in December 2012 and embarked on a set of economic policies dubbed Abenomics. Abe’s economic program consisted of three arrows: (1) expansionary monetary policy, (2) expansionary fiscal policy, and (3) structural reforms. Under governor Haruhiko Kuroda’s leadership, the Bank of Japan has vigorously pursued expansionary policy. But fiscal policy, while initially expansionary, turned contractionary with the increase in the consumption tax from 5% to 8% in April 2014. And structural reforms, while potentially of enormous importance, remain largely unimplemented. Since monetary policy is the arrow of Abenomics that is the most novel and the most fully implemented, here we focus primarily on its effects.

In April 2013, the Bank of Japan embarked on a program of “quantitative and qualitative easing” with the goal of achieving 2% inflation in two years. To achieve this goal, between the fourth quarter of 2012 and the first quarter of 2015, the Bank of Japan increased the monetary base from 25% of GDP to 57% of GDP. It accumulated 128 trillion yen of Japanese government debt (JGBs), equal to more than 25% of GDP.<sup>1</sup>

In the next section, we review the effects of Abenomics, and these monetary actions in particular, on intermediate indicators. Building on the analysis in our previous paper ([Hausman and Wieland, 2014](#)),<sup>2</sup> we show that expansionary monetary policy continued to weaken the yen and raise stock prices in 2014. Yet effects on nonfinancial variables were muted. Inflation expectations from market participants and professionals forecasters remain roughly one half to one percentage point below the Bank of Japan’s 2% target. Actual headline and core inflation are also still well below 2%. We argue that persistent low expected inflation largely reflects imperfect credibility of the 2% inflation target, although we cannot rule out some role for adaptive expectation formation and backward looking price-setting behavior.

In section 3, we consider the response of output to Abenomics. Performance has been disappointing: between the fourth quarter of 2012 and the second quarter of 2015, annualized GDP

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<sup>1</sup>For more details on quantitative easing in Japan, see [Ito \(2014\)](#)

<sup>2</sup>For another recent evaluation of Abenomics, see [Patrick \(2014\)](#).

growth averaged 0.9%.<sup>3</sup> This is in part because despite a roughly one percentage point decline in the real interest rate, consumption has not risen during Abenomics. To better understand this, we use the Japanese Family Income and Expenditure Survey to investigate how expansionary monetary policy is affecting different types of households. Results are disappointing in that there are no visible effects of monetary policy on the consumption of households expected to benefit most, net debtors and the young. In contrast, the April 2014 consumption tax increase had large effects on the consumption of all types of households. Thus the story of flat consumption in Japan may be one in which expansionary monetary policy had relatively little positive effect while contractionary fiscal policy had large negative effects. A further, more mysterious factor behind slow output growth in Japan is a large increase in real imports. Since Abenomics began, real imports have risen over 10% despite flat consumption and a weakening yen. We discuss three popular hypotheses — a decline in the relative price of imports, an increase in energy import demand, and an increase in foreign electronics demand —, but find all of them to be either unsupported by the data or too small to explain the size of the import increase. Thus, in our view, the response of imports remains a puzzle.

Section 4 turns to the outlook for future output and consumption in Japan. Consensus forecasts are for the level of GDP over the next five years to be nearly the same as that forecast in October 2012, before Abenomics began. This is in large part because the path of Japanese consumption is now forecast to be below that expected in October 2012. This is consistent with a larger than expected negative effect of the consumption tax and the lack of progress on structural reforms.

We concluded in [Hausman and Wieland \(2014\)](#) that the first arrow of Abenomics, expansionary monetary policy, most likely passed a cost-benefit test. We would not change this conclusion. The magnitude of the benefits is uncertain, but for reasons detailed in our prior paper, the costs are likely small. We end this paper with suggestions for how the Bank of Japan might provide additional stimulus to the economy.

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<sup>3</sup>All data are as of 8/28/15. See the data appendix for information on sources.

## 2 Intermediate indicators

**2.1 Financial markets** Abenomics has continued to have large effects on financial markets. Figure 1 shows updated versions of the financial market figures in [Hausman and Wieland \(2014\)](#). The figures show that financial market developments have generally continued along their early 2014 paths. The two vertical lines in the graphs correspond to November 2012, when then-candidate Shinzo Abe made clear his economic policy intentions, and to October 2014, when the Bank of Japan expanded its quantitative and qualitative easing program, raising the targeted annual increase in the monetary base from 60-70 trillion yen (12-14% of 2014 GDP) to 80 trillion yen (16% of GDP).<sup>4</sup>

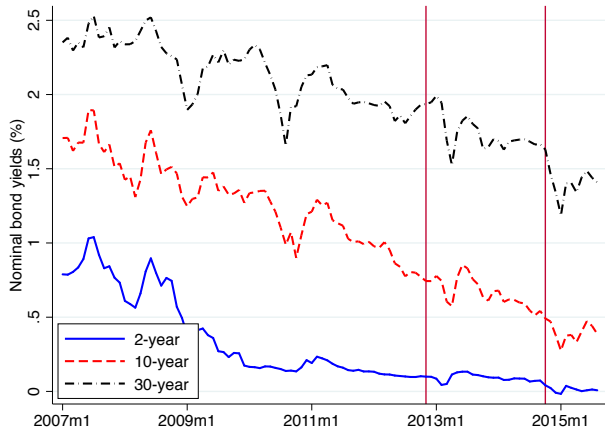
Over 2014, the most dramatic financial developments have been to the value of the yen and to Japanese stock prices. The yen weakened from 79 per dollar in October 2012 to 102 per dollar in March 2014<sup>5</sup> and 123 per dollar in August 2015. This nominal exchange rate movement has been largely reflected in Japan's trade-weighted real exchange rate. According to the broad BIS index, the real trade-weighted yen weakened 44% between October 2012 and July 2015. In July 2015, the real trade-weighted yen was weaker than at any time since 1982.<sup>6</sup> Stock prices have also continued to rise rapidly. From October 2012 to March 2014, the broad Topix index rose 62%; between March 2014 and August 2015, it rose a further 36%. Of course, the coincidence of these asset price movements with expansionary monetary policy is no proof that these asset price movements were caused by monetary policy. The best evidence for this assertion comes from movements in asset prices on the day of significant monetary policy announcements. We documented in [Hausman and Wieland \(2014\)](#) that declines in nominal interest rates, declines in the value of yen, and increases in the stock market coincided with news of expansionary policy. These effects are consistent with time series evidence on the effects of quantitative easing in Japan ([Ito, 2014](#)). Further evidence comes from the financial market reaction to the announcement of the expansion of quantitative and qualitative easing on October 31, 2014. On

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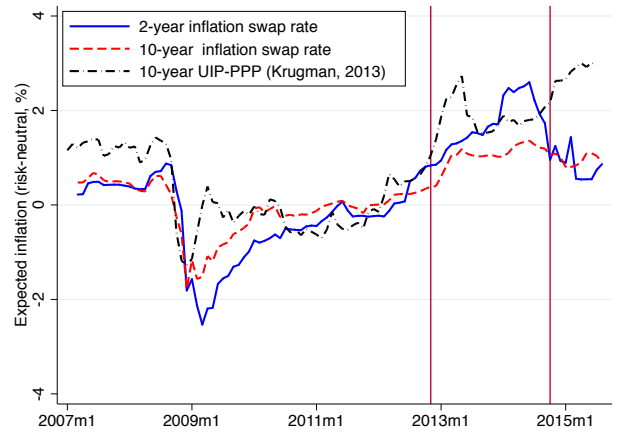
<sup>4</sup>See [Bank of Japan statement](#).

<sup>5</sup>March 2014 was the last data point included in [Hausman and Wieland \(2014\)](#).

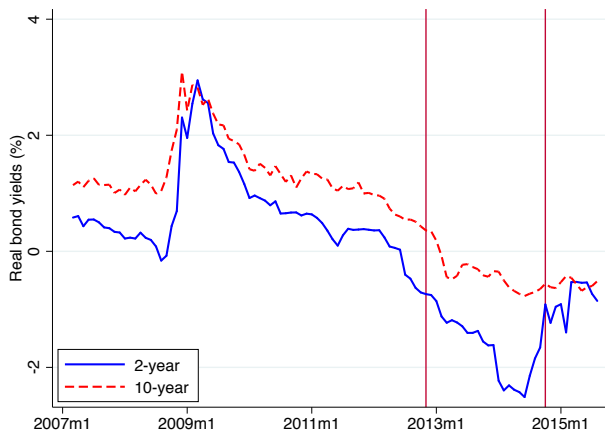
<sup>6</sup>This statement is based on the BIS narrow, trade-weighted index, since the broad index begins only in 1994.



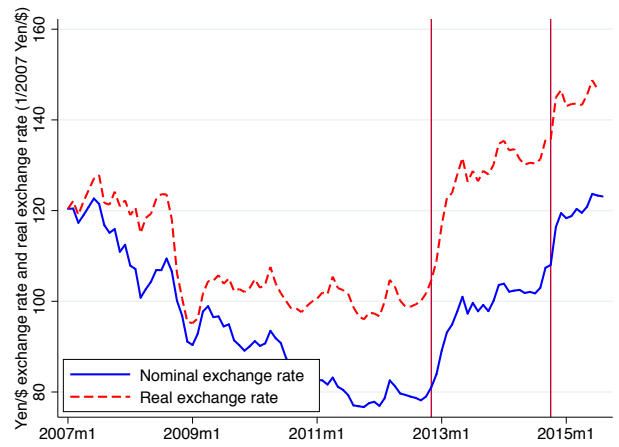
(a) Nominal bond yields



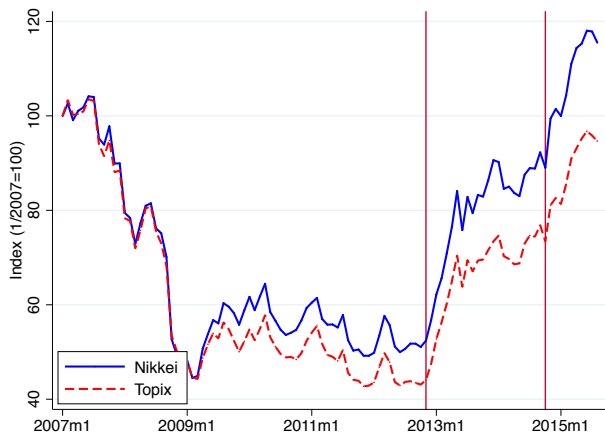
(b) Market inflation forecasts



(c) Real bond yields



(d) Exchange rates



(e) The stock market

Figure 1 – Abenomics’ financial market effects. Abenomics begins at the red line, November 2012. The second red line denotes October 2014, when quantitative easing was expanded. The UIP-PPP measure of inflation expectations is calculated using the uncovered real interest rate parity condition and U.S. TIPS. For details, see [Krugman \(2013\)](#) and [Hausman and Wieland \(2014\)](#). Real bond yields are calculated as the difference between nominal bond yields and inflation swap rates. *Source:* See data appendix.

this day, 30-year bond yields fell 5 basis points, the yen weakened 2.8% against the dollar, and the Topix stock market index rose 4.3%.<sup>7</sup>

**2.2 Inflation** A primary goal of Abenomics, particularly the monetary arrow, is to end Japan’s 15 years of deflation. So far, it has succeeded. Figure 2(a) shows three measures of prices in Japan. In each, the effect of the three percentage point increase in the consumption tax in April 2014 is obvious. But even apart from this tax increase, prices have generally risen.

The Bank of Japan has not, however, achieved its stated goal of two percent inflation. From July 2014 to July 2015, the overall CPI rose 0.2%, while the CPI excluding food and energy rose 0.6%. We saw in figure 1(b) that market inflation expectations generally remain below 2%. And the four other measures shown in figure 2(b) confirm that there was little increase in inflation expectations during 2014. Household inflation expectations, as measured by the Bank of Japan opinion survey, and firm inflation expectations, as measured by the Tankan survey, changed little. (The Tankan survey began to ask about inflation expectations only in March 2014.) Ten-year inflation expectations from Consensus forecasts rose slightly but remain below 2%.

Three mechanisms are likely driving the incomplete adjustment of expected inflation towards the 2% target: adaptive expectations (slow updating), backward-looking price-setting and / or imperfect credibility. To better understand which of these factors is quantitatively most important, we conduct the following exercise: first, we estimate a Phillips curve for Japan following Coibion and Gorodnichenko (2015). We use inflation forecasts and output gap data<sup>8</sup> to estimate a new Keynesian Phillips curve with a fraction  $\beta_1$  of backward-looking firms,

$$\pi_t - E_t\pi_{t+1} = \beta_1(\pi_{t-1} - E_t\pi_{t+1}) + \beta_2x_t + \varepsilon_t. \quad (1)$$

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<sup>7</sup>Unfortunately, the interpretation of these movements is complicated by the fact that on the same day, October 31, 2014, the Japan Government Pension Investment Fund announced that it would be purchasing more Japanese and foreign stocks instead of Japanese bonds (Bloomberg). The decline in bond yields on this day, however, suggests that the monetary policy announcement had larger financial market effects than the pension fund decision.

<sup>8</sup>We use the IMF April 2015 WEO output gap data. This is not inconsistent with our argument in Hausman and Wieland (2014) that this measure underestimates the possible effect of monetary policy on output in the long-run. But for the Phillips curve, what is relevant is potential output in the short run.

We estimate this equation by OLS and IV on annual data from 1989 to 2015, where the instruments are a lag of the output gap  $x_{t-1}$  and lagged forecasts  $\pi_{t-1} - E_{t-1}\pi_{t+1}$ . We use the IV approach, standard in this literature (Coibion and Gorodnichenko, 2015), to avoid bias due to contemporaneous supply shocks moving the output gap and expected inflation in opposite directions. The structure imposes a vertical Phillips curve, which is a restriction not rejected by the data. Appendix table 2 reports the results; they suggest that backward-looking price setting is small, with  $\beta_1$  below 0.25.

Second, given (1) we solve for the expected path of inflation using output gap forecasts and a terminal condition that inflation reach a target  $\mu$  (e.g., 2%) in 2030.<sup>9</sup> This corresponds to the (credible) expected rate of inflation in the very long-run. We allow for expected inflation in the Phillips curve to be partially adaptive,

$$E_t\pi_{t+1} = \lambda\pi_{t-1} + (1 - \lambda)\pi_{t+1}. \quad (2)$$

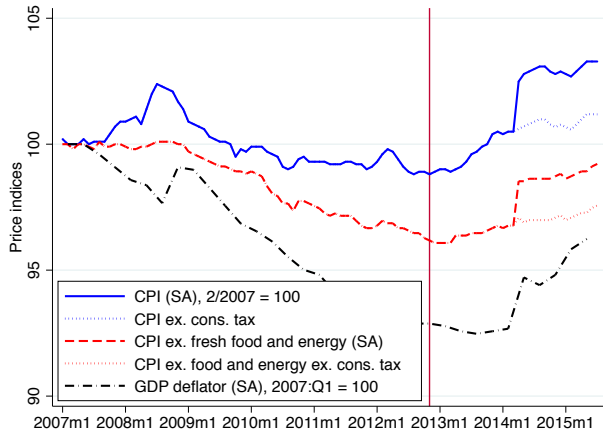
$\lambda$  indexes adaptiveness and  $\pi_{t+1}$  is the solution to (1). Rational expectations corresponds to the case  $\lambda = 0$ , whereas price-setters having fully adaptive expectations corresponds to  $\lambda = 1$ .<sup>10</sup> Iterating on (1) and (2) until convergence, we can determine what combinations of long-run actual inflation ( $\mu$ ) and degree of adaptiveness ( $\lambda$ ) can rationalize the market and professional long-run inflation forecasts. In figure 3(a), we show the implied 10-year inflation forecasts for combinations of  $\mu$  and  $\lambda$ . To rationalize the long-run 1.45% inflation forecast from Consensus economics requires either a large degree of adaptiveness in expectations,  $\lambda \approx 0.4 - 0.5$ , or that forecasters believe long-run inflation ( $\mu$ ) will be only 1.5% or some combination. This exercise suggests to us that a lack of credibility, e.g. a belief that long-run inflation will fail to reach 2%, likely plays an important role, since its absence would imply an extreme degree of adaptiveness.

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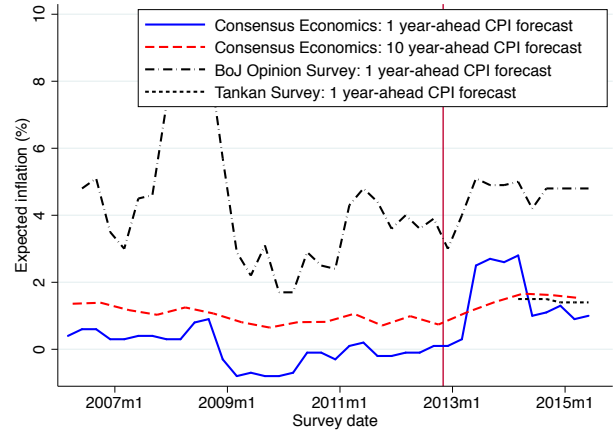
<sup>9</sup>We linearly extrapolate the 2020 WEO output gap forecast to reach zero in 2030. Results are not sensitive to this assumption since the projected output gap in 2020 is small. Results are also not sensitive to extending the time horizon when the inflation target becomes credible.

<sup>10</sup>Imperfect information corresponds to a generalization where  $\lambda_t = (1 - \theta)^t$  and  $\theta$  is the fraction of agents updating information every year. The literature suggests that  $\theta \approx 0.68 - 0.94$  (Mankiw and Reis, 2002; Mankiw, Reis, and Wolfers, 2004; Coibion and Gorodnichenko, 2012), which given that the 2% target was announced in 2013 implies  $\lambda \approx 0$  today. Thus we view the imperfect information case as being roughly captured by the  $\lambda = 0$  calibration.

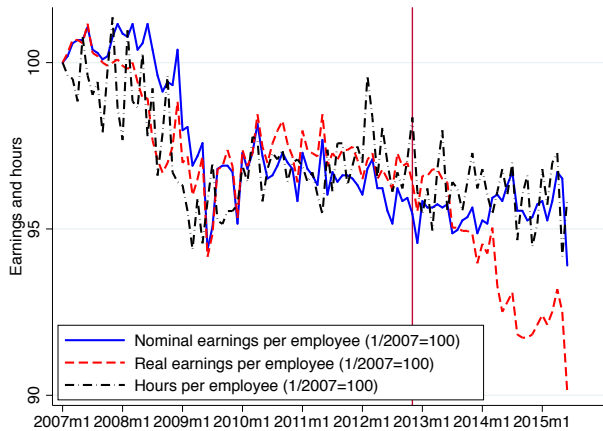




(a) Price indices



(b) Survey inflation forecasts



(c) Earnings and hours

Figure 2 – Japanese actual and expected inflation and wages. Abenomics begins at the vertical line, November 2012. In (a), direct effects of the consumption tax are excluded from the CPI by assuming that the consumption tax raised 12-month headline (excluding food and energy) inflation 1.9 percentage points (1.5 percentage points) in April 2014, and 2.1 percentage points (1.7 percentage points) from May 2014 through March 2015. These are the figures suggested by the [Bank of Japan](#); they are less than the 3 percentage point increase in the consumption tax, since the tax did not apply to roughly 1/3 of the goods and services in the CPI (e.g. rent and private school fees). In (c), real wages are nominal wages deflated by the CPI excluding imputed rent (but including the consumption tax). *Source:* See data appendix.

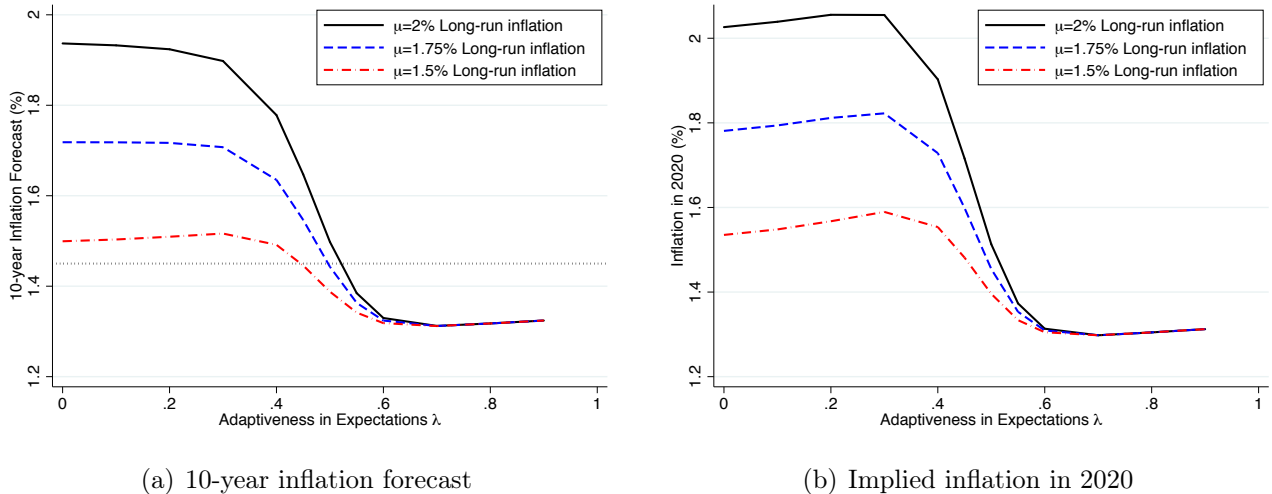


Figure 3 – The left panel plots implied 10-year inflation forecasts from solving the estimated Phillips curve (1) and expectations formations (2) for combinations of credible long-run inflation  $\mu$  and adaptiveness  $\lambda$ . The horizontal dotted line in the left panel is the 10-year ahead inflation forecast by Consensus Economics. The right panel displays the implied inflation rate in 2020 for these combinations.

For instance, suppose forecasters were certain that Japan would achieve 2% inflation in 2030 ( $\mu = 2\%$ ) so that the deviation of expected inflation from 2% today is explained entirely by adaptive expectations. Then actual inflation in 2020 would still be less than 1.6% (figure 3(b)).

Along with inflation expectations, in Hausman and Wieland (2014) we argued that nominal wage growth would be a critical indicator of Abenomics’ success. This is because nominal wage growth is both a cause and an effect of inflation expectations, and because real wages are likely to be an important determinant of consumption. Here the data continue to be disappointing. Figure 2(c) shows nominal earnings per person in the Japanese economy since 2007. There is no obvious increase in nominal earnings after Abenomics begins. Thus, the recent increase in prices (figure 2(a)) has meant a steady decline in real earnings. From the second quarter of 2014 to the second quarter of 2015, real CPI-deflated<sup>11</sup> earnings per employee fell 1.4%; per hour, they fell -0.9%. Cumulatively, over the three years from the second quarter of 2012 to the second quarter of 2015, real earnings per employee fell 5.0%; per hour they fell 3.7%.<sup>12</sup>

<sup>11</sup>Following the convention of the Monthly Labour Survey from Japanese Ministry of Health, Labour, and Welfare, we report real wages as nominal earnings deflated by the CPI excluding imputed rent.

<sup>12</sup>These data are from the Monthly Labour Survey, Japan’s establishment employment survey. The figures from this survey include only ‘regular’ employees: these are employees working more than one month or who were employed for the majority of the previous two months, including part-time employees. The sample covers private, non-agricultural industries. For more details, see Ministry of Health, Labour, and Welfare and IMF.

There are likely three principal reasons why Abenomics has yet to translate into higher nominal wages, let alone higher real wages. First, the decline in real wages reflects in part a compositional effect due to a rising share of lower-paid part-time employment ([Aoyagi and Ganelli, 2015](#); [Sommer, 2009](#)). But even within these classification, real wages fell during Abenomics. Between the second quarter of 2012 and the second quarter of 2015, real hourly earnings for full-time workers fell 3.5% and those of part-time workers fell 0.8%. Thus, a shift in the composition of employment towards part-time work does not alone explain the decline in real wages.

Second is the small change in inflation expectations, in particular expectations by firms of prices for their own products. In addition to asking firms about their CPI forecast, the Tankan survey asks firms what they expect to happen to prices for their own output. In the June 2015 survey, firms expected to raise their own output price by an average of 0.9% over the next year. Thus it is perhaps unsurprising that firms are reluctant to pay higher nominal wages. An exception are large exporters, which have benefited from the weak yen, making it easier for them to grant wage increases. At Toyota, for instance, workers received a 3.2% increase in monthly pay during the spring 2015 Shuntō (annual spring wage negotiations).<sup>13</sup> However, the aggregate data show that this example is not representative.

Third, falling wages may reflect a labor market that is by some indicators still weak. For those age 15 to 64, the employment to population ratio steadily rose to nearly 73% in 2014<sup>14</sup> and, in absolute terms, Japanese unemployment is low: 3.3% in July 2015. Relative to the average unemployment rate in the 1980s of 2.5%, however, current unemployment in Japan is high. And the rise in participation and decline in unemployment has not been accompanied by an increase in monthly hours ([figure 2\(c\)](#)): between the second quarter of 2012 and the second quarter of 2015, average monthly hours worked per full-time employee were unchanged, while average hours for all employees fell 1.4%.

The disappointing response of wages to Abenomics has led to political pressure and tax

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<sup>13</sup>On Toyota's profits see [Wall Street Journal](#). The wage figure excludes bonuses ([Wall Street Journal](#)).

<sup>14</sup>Most of this increase came from a rise in the female employment to population ratio from 61% in 2012 to 64% in 2014. For more on this trend, see [Posen \(2014\)](#).

incentives for firms to increase wages. Both prime minister Abe and governor Kuroda have pressured firms to raise wages.<sup>15</sup> In addition to this moral suasion, in 2013 the Abe administration introduced a tax credit for firms indexed to their wage bill.<sup>16</sup> Whatever the economic merit of such policies, however, they have not yet led to real wage growth.

### 3 Output

Macroeconomic theory suggests that the monetary arrow will contribute to higher output by lowering real interest rates and weakening the yen, thus raising consumption, investment, and net exports.<sup>17</sup> Unfortunately, these effects thus far appear small. Table 1 reproduces table 1 in Hausman and Wieland (2014) and adds two lines showing the performance of the Japanese economy in 2013 and 2014. The table shows that relative to Japan's experience during its two lost decades of the 1990s and 2000s, performance in 2013 was excellent while that in 2014 was mediocre. In 2013, headline real GDP growth averaged 1.6% (panel A), which translated to 3.2% growth per working age person (panel B). This was more rapid growth than that in Japan during the boom decades of the 1970s and 1980s. Unfortunately, growth turned negative in 2014. Real GDP in Japan in 2015:Q2 was only 2.2% above its 2012:Q4 level. Real gross domestic income (GDI) suggests similarly slow growth: in 2015:Q2, it was 2.8% above its 2012:Q4 level.

Figure 4(a) provides a more fine-grained perspective; it shows quarterly GDP growth at an annual rate in Japan since 2007. There is a clear reversal of progress after the increase in the consumption tax from 5 to 8% in April 2014. Figure 4(a) also highlights that measured Japanese GDP growth is quite volatile,<sup>18</sup> which makes it difficult to draw strong conclusions

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<sup>15</sup>See Wall Street Journal and Aoyagi and Ganelli (2015). A historical analogy to the efforts of the Abe administration to persuade firms to raise wages is to the efforts of presidents Hoover and Roosevelt to persuade firms to raise wages during the U.S. Great Depression (Rose, 2010; Cole and Ohanian, 2004). These policies remain controversial with the benefits of higher inflation and inflation expectations (Eggertsson, 2012) needing to be weighed against the costs of labor market distortions (Cole and Ohanian, 2004; Friedman and Schwartz, 1963; Cohen-Setton, Hausman, and Wieland, 2015).

<sup>16</sup>See KPMG Japan Tax Newsletter and Aoyagi and Ganelli (2015).

<sup>17</sup>For monetary policy to have real effects there have to be slack resources in the economy. In Hausman and Wieland (2014), we argue that this is the case and that official estimates of the output gap underestimate the scope for demand-based policies.

<sup>18</sup>Over the 20-year period from 1995 through the second quarter of 2015, the standard deviation of quarterly (non-annualized) GDP growth in Japan was 1.1% while that in the U.S. was 0.6%. Excluding quarters sur-

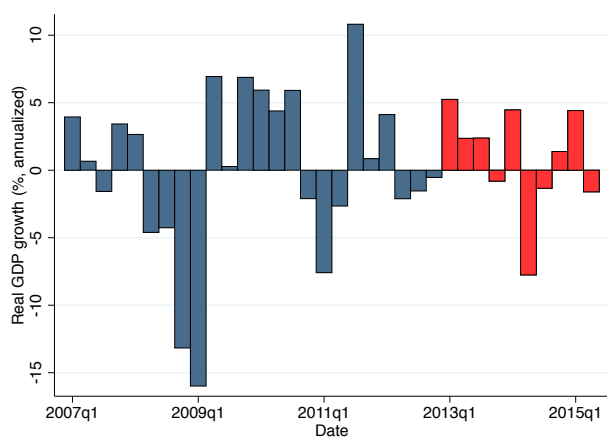
Table 1 – Macro summary statistics

| <b>Panel A: Raw data</b> |                               |                          |                      |                                   |  |
|--------------------------|-------------------------------|--------------------------|----------------------|-----------------------------------|--|
| Year                     | Real GDP growth<br>(% change) | Unemployment rate<br>(%) | CPI inflation<br>(%) | Money market interest rate<br>(%) |  |
| 1974-1992 average        | 4.0                           | 2.3                      | 4.8                  | 6.8                               |  |
| 1993-2007 average        | 1.1                           | 4.1                      | 0.1                  | 0.6                               |  |
| 2008-2012 average        | -0.2                          | 4.6                      | -0.2                 | 0.2                               |  |
| 2013                     | 1.6                           | 4.0                      | 0.3                  | 0.1                               |  |
| 2014                     | -0.1                          | 3.6                      | 1.2*                 | 0.1                               |  |

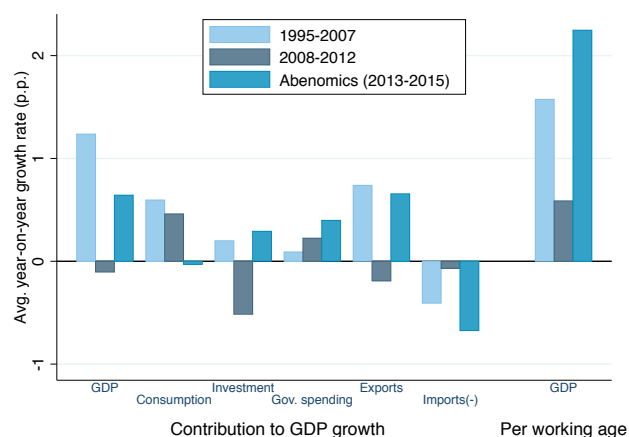
  

| <b>Panel B: Adjusted for working age population</b> |   |      |  |      |                                    |      |
|---|---|------|--|------|------------------------------------|------|
| Year  | Real GDP per person age 15-64<br>(% change) |      | Multifactor productivity<br>(% change) |      | Employment / pop. age 15-64<br>(%) |      |
|   | Japan                                       | U.S. | Japan                                  | U.S. | Japan                              | U.S. |
| 1974-1992 average                                   | 3.1   | 1.5  | -                                      | -    | 67.4                               | 68.1 |
| 1993-2007 average                                   | 1.4   | 1.9  | 0.7                                    | 1.1  | 69.3                               | 72.5 |
| 2008-2012 average                                   | 0.5   | 0.1  | 0.3                                    | 0.7  | 70.8                               | 67.8 |
| 2013  | 3.2   | 1.1  | 1.5                                    | 0.4  | 71.7                               | 67.4 |
| 2014  | 1.4   | 2.1  | -                                      | -    | 72.7                               | 68.1 |

\*This excludes the direct effect of the April 2014 increase in the consumption tax from 5 to 8% (see [Bank of Japan](#)). Including the consumption tax, CPI inflation was 2.8%. *Sources for Japanese and U.S. data:* See data appendix.



(a) Quarterly growth



(b) Contributions to growth

Figure 4 – Panel (a) shows annualized quarter-on-quarter GDP growth since 2007. Quarters since Abenomics began are marked in red. Panel (b) provides a comparison of contributions to GDP by component during Abenomics (2012-2015), the lost decade excluding the Great Recession (1994-2007), and the Great Recession (2007-2012). Contributions are calculated as in [Japan's national accounts](#). Panel (b) also displays working-age adjusted GDP growth. *Source:* see data appendix.

from one or even two or three quarters of growth. Thus [figure 4\(b\)](#) provides an alternative way of assessing recent performance that aggregates across several quarters. It shows contributions to growth under Abenomics compared with those during Japan’s lost decade (1995-2007) and the Great Recession (2008-2012).

[Figure 4\(b\)](#) suggests three conclusions. First, as the difference between the first and last columns indicates and as one sees in [table 1](#), any comparison of current Japanese economic performance to that in the past or to that in other countries ought to adjust for working age population. Without this adjustment, performance under Abenomics looks dismal. With this adjustment, it looks reasonable. Second, consumption has contributed remarkably little to growth under Abenomics; in the second quarter of 2015, consumption was 0.6% *below* its level in the fourth quarter of 2012. Third, under Abenomics most of the positive contribution to growth from exports has been negated by a negative contribution from imports.

We first turn to cross-sectional household expenditure data to learn more about the recent behavior of Japanese consumption under Abenomics. Like the aggregate time series, the cross-sectional data suggest little effect of expansionary monetary policy on consumption. We use the Japanese Family Income and Expenditure Survey, a survey of approximately 9,000 Japanese households. The Japanese Statistics Bureau publishes a breakdown of survey household consumption by house ownership status, age bins and income quintiles.<sup>19</sup> We deflate these series by the CPI and seasonally-adjust each series using an X-12 ARIMA(1,1) model with 12 monthly dummies.

The monetary policy arrow of Abenomics should have differential effects on these groups. First, higher expected (and actual) inflation constitutes a transfer from which mortgagors ought to benefit relative to renters and home owners ([Eggertsson and Krugman, 2012](#); [Cloyne, Ferreira, and Surico, 2015](#)). We also expect older households to be less willing to intertemporally substitute given finite horizons ([Del Negro, Giannoni, and Patterson, 2015](#)), to be more likely

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rounding consumption tax hikes (the first and second quarters of 1997 and 2014) and the quarters affected by the 2011 earthquake (first, second, and third quarters of 2011) only lowers the standard deviation of quarterly growth in Japan from 1.1% to 1.0%.

<sup>19</sup>These data are only accessible from the Japanese version of the website at <http://www.e-stat.go.jp/SG1/estat/eStatTopPortal.do>. We are grateful to Hiroshi Matsushima for help with translation.

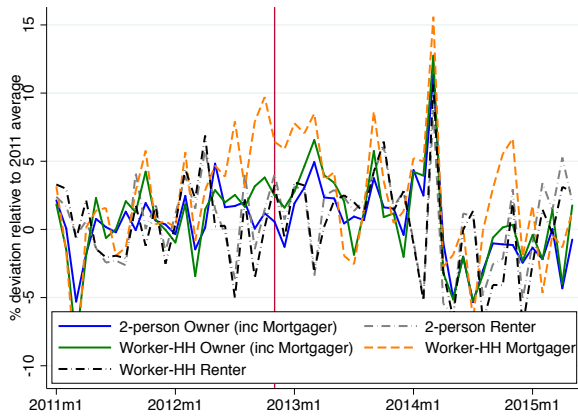
to be creditors, and to be less likely to benefit from any labor market improvements under Abenomics. Thus, we would expect their responses to be muted relative to younger households. The breakdown by income is more ambiguous: higher-income households may have a greater ability to intertemporally substitute ([McKay, Nakamura, and Steinsson, 2015](#); [Werning, 2015](#)), but poorer households may increase consumption more when income or credit supply grows.

Figure 5 plots real total consumption expenditure and domestic nondurable consumption expenditures along these dimensions relative to their 2011 log levels. We do not observe strong patterns that confirm the cross-sectional predictions in the previous paragraph. The consumption of mortgagers looks quite similar to that of renters and owners; the consumption of the elderly is similar to that of the young; and the consumption of the rich and the poor moves similarly. In part this inference is a product of the noise in the consumption series. The repeated cross-sectional nature of the data does not allow us to filter any noise. A detailed study of the micro-data might be better able to reveal differential effects of monetary policy, but with the data at hand we fail to see much evidence for large effects.

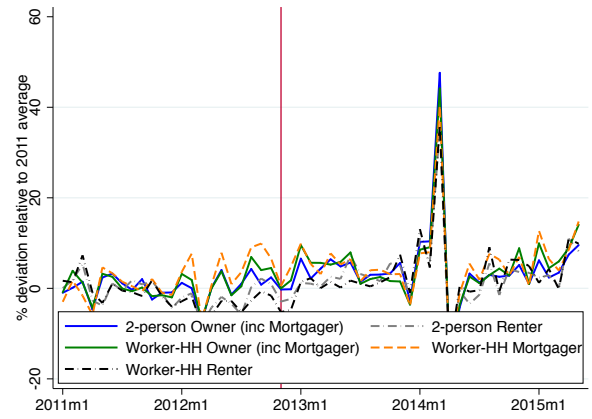
In contrast to the absence of evidence for effects of monetary policy on consumption, the effects of the 3 percentage point increase in the consumption tax in April 2014 are clear. In advance of the consumption tax, consumption boomed. It then plummeted. It may be surprising that the consumption tax had large intertemporal effects whereas monetary policy did not, but this response is in fact consistent with standard models. In appendix C we consider a consumption choice problem over storable and non-storable nondurable consumption goods as in [Barsky, House, and Kimball \(2007\)](#).<sup>20</sup> In this model, an anticipated consumption tax raises current consumption by lowering the real interest rate (the intertemporal price of consumption). Given the discrete nature of the consumption tax, the increase in the real interest rate just before the tax hike is large relative to storage costs. This gives rise to a discrete change in consumption expenditures. By contrast, if monetary policy causes only a smooth change in prices and the real interest rate, then it may not be optimal for consumers to discretely adjust their expenditures.

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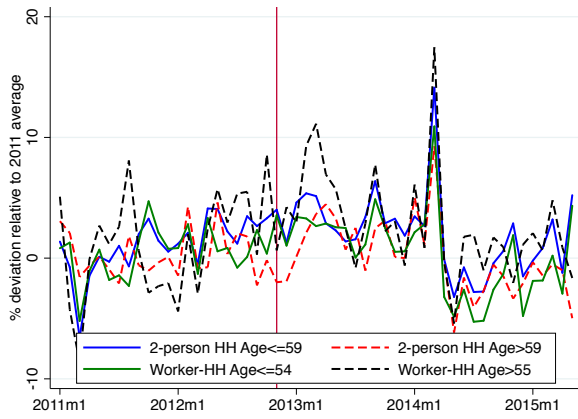
<sup>20</sup>For another model of the effects of the consumption tax, see [Cashin and Unayama \(2015\)](#).



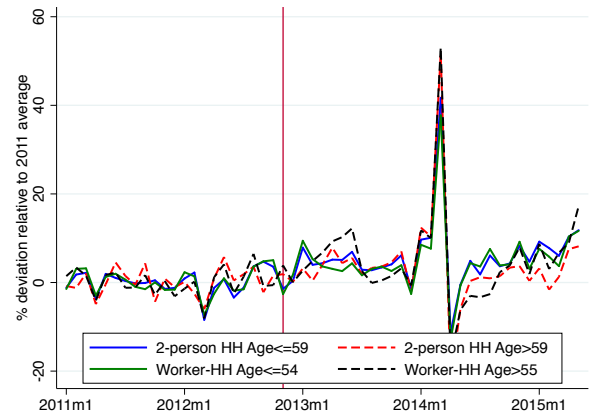
(a) Consumption expenditures: by ownership



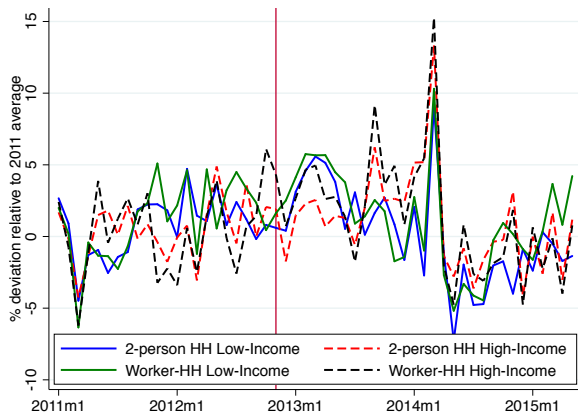
(b) Domestic nondurables: by ownership



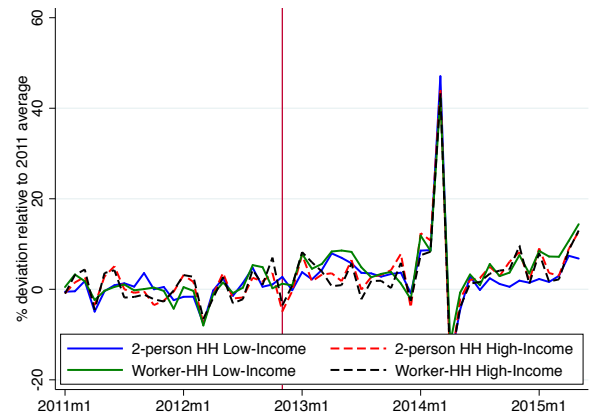
(c) Consumption expenditures: by age



(d) Domestic nondurables: by age



(e) Consumption expenditures: by income



(f) Domestic nondurables: by income

Figure 5 – Household consumption sorted along home ownership, age, and income dimensions. Data are from the Family Income and Expenditure Survey. Abenomics begins at vertical red line (November 2012).



Likely adding to the effects of the April 2014 consumption tax increase was that at the time consumers expected the consumption tax to rise by a further 2 percentage points in October 2015.<sup>21</sup> (In fact, after the poor performance of the Japanese economy in the second and third quarters of 2014, the Abe administration postponed the October 2015 consumption tax increase to April 2017.) This added to the incentive to buy storable goods in advance of the April 2014 tax increase.

The performance of net exports under Abenomics has also been surprisingly disappointing. Between the fourth quarter of 2012 and the second quarter of 2015, real exports grew 15% and real imports grew 12%.<sup>22</sup> While one might have hoped for (even) stronger export growth, the larger mystery is why real import volumes have grown so rapidly despite a weaker yen and slow real output growth. Had import volumes remained flat, Japanese real GDP would have grown up to 3.8% rather than 2.2% since the end of 2012. This upper bound assumes a complete substitution of imports with domestic goods, but even for intermediate rates of substitution, growth would have been noticeably faster.

We have yet to find a fully convincing explanation for the recent rise in import volumes. But we can rule out three hypotheses. First, one might wonder if Japan's import prices have in fact increased. Perhaps the combination of falling commodity prices and pricing-to-market for other imports meant the yen depreciation was not associated with higher import prices. The data suggest otherwise. Measured by the import price deflator, between the fourth quarter of 2012 and the second quarter of 2015, import prices rose 7.0%. To be sure, this is far less than the yen depreciated, but it is nonetheless substantial. It fits with the results in [Gopinath \(2015\)](#) showing rapid pass-through from yen movements to Japanese import prices. She estimates that a 10% yen depreciation raises Japanese import prices (at the dock) by 8.3% within one quarter.

Second, one might be tempted to ascribe the increase in import volumes to substitution of fossil fuels for nuclear power in the aftermath of the 2011 Fukushima disaster. Fossil fuel

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<sup>21</sup>We are grateful to Takashi Unayama for making this point to us.

<sup>22</sup>There is a break in the Japanese Balance of Payments data due to item reclassifications at the start of 2014, with some effect on the real export and import data ([Bank of Japan, 2013](#)). In appendix [A.1](#) we provide further details and argue that adjusting for reclassification does not change the broad story of rising real export and import volumes.

imports did increase after Japan shut down its nuclear reactors, but this increase occurred before Abenomics began in late 2012. Between the first half of 2012 and the first half of 2015, the quantity of petroleum and liquid natural gas imports actually fell, while imports of coal rose less than 4%. A further problem for this hypothesis is that it cannot explain why import volumes of services rose even more rapidly than those of goods during Abenomics; between the fourth quarter of 2012 and the second quarter of 2015, real goods imports rose 9.7% while real services imports rose 22.9%.

Third, the IMF ([International Monetary Fund, 2014](#)) suggests that the real import increase reflects growing Japanese demand for foreign electronics. Like the energy hypothesis above, this cannot explain the rise of service imports. But aside from this, the limited data available suggest it is an incomplete explanation. The yen value of Japanese imports of computers and phones (broadly defined<sup>23</sup>) rose by 1.2 trillion between the first half of 2012 and the first half of 2015. Had this rise not occurred, overall nominal Japanese imports would have risen 17.9% rather than 19.5%. Thus even with falling import prices for electronics and rising import prices for other goods and services, it is difficult to see how this story can account for very much of the increase in real Japanese import volumes.

## 4 Medium-Run to Long-Run Outlook

Japan's lackluster economic performance over the past two years is a reminder of the difficulty of macroeconomic forecasting. Both professional and model-based forecasts have been to varying degrees too optimistic. Thus we are now more pessimistic than we were eighteen months ago about the long-run output effects of Abenomics.

Figure 6 updates figure 11 in [Hausman and Wieland \(2014\)](#). It shows long-run professional forecasts from Consensus Economics for the level of real Japanese output and consumption. In our previous paper, we compared the forecast made in October 2013 to that made in October 2012, with the increase in the level suggesting real gains from Abenomics. Unfortunately, as the solid blue line shows, actual output and consumption has been below the level forecast

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<sup>23</sup>We include computers and parts, semiconductors, audio and visual equipment, and telephony and telegraphy in this calculation.

in October 2013. Perhaps more troubling, long-run forecasts have reverted back to their pre-Abenomics level in the case of output, and are below their pre-Abenomics level in the case of consumption. This is worrisome both because the forecast may be correct, and because it is an indicator of lackluster growth expectations.

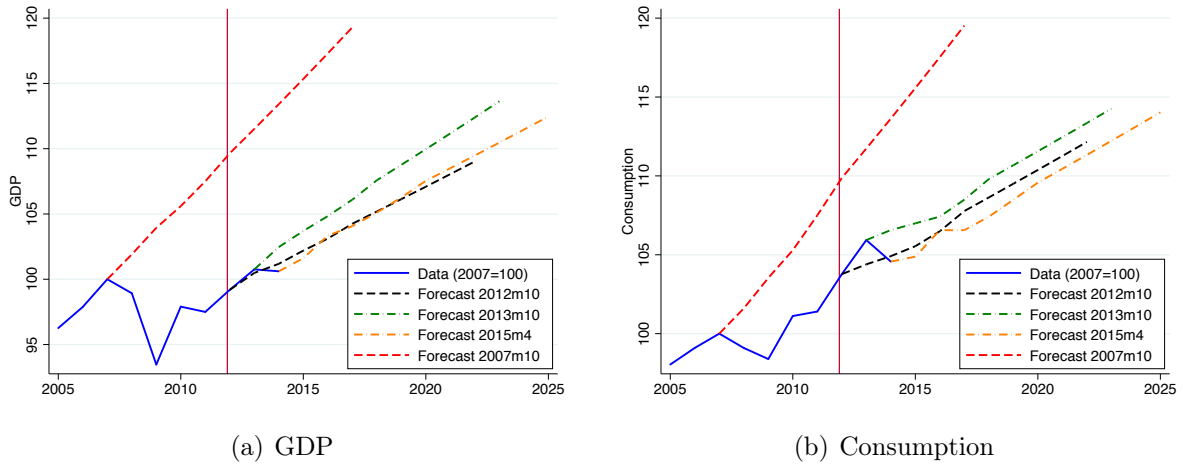


Figure 6 – Actual and forecast output and consumption. Forecasts are from Consensus Economics. Abenomics begins at vertical red line (2012).

When Abenomics began, there were at least two reasons to be more optimistic. First, given that Abenomics reduced real interest rates by roughly one percentage point, conventional new Keynesian models suggested output gains in the 5 to 10% range. Second, a natural historical analogy for Abenomics is to the regime change engineered by Franklin Roosevelt in spring 1933 (Kuroda, 2013; Romer, 2014). In the four years after 1933, U.S. real GDP growth averaged 9.4%.

There are three reasons why these model and history based predictions may thus far have been wrong. First, perhaps slow growth is primarily due to the consumption tax increase. Unfortunately, quantifying the negative effects of the consumption tax on output is difficult given widely varying estimates of the tax multiplier in Japan (Kuttner and Posen, 2001; Kang, Keen, and de Mooij, 2011). If the tax multiplier is large, then fiscal consolidation will continue to depress Japanese output in the medium run.<sup>24</sup>

<sup>24</sup>In the April 2015 *World Economic Outlook*, the IMF predicts that Japan’s structural budget deficit as a percent of potential GDP will decline by slightly more than one percentage point in both 2015 and 2016 and by roughly half a percentage point in 2017 and 2018.

Second, perhaps Abenomics is affecting the economy only with a long lag. Estimates for conventional monetary policy suggest, however, that the peak effect on output is reached after 18 to 24 months ([Christiano, Eichenbaum, and Evans, 1999](#); [Romer and Romer, 2004](#)). Depending on whether one views Abenomics as having started with Abe’s political campaign in November 2012 or with the announcement of qualitative and quantitative easing in April 2013, the peak effects ought to have either already occurred or ought to occur in early 2015. For Abenomics, however, the net export response may be unusually slow. For example in July 2015—more than two years after the yen significantly weakened—Honda and Nissan announced that they would make a substantial shift towards producing cars for export in Japan.<sup>25</sup> This suggests that credibility of continued expansionary policy may be an important determinant of the net export response under unconventional monetary policy.

Third, perhaps the new Keynesian model and the 1933 analogy may be poor guides to the current Japanese macroeconomy. Recent events in Japan align with a growing literature suggesting that the new Keynesian model may exaggerate the output effects of forward guidance ([Del Negro et al., 2015](#); [McKay et al., 2015](#)). In [Hausman and Wieland \(2014\)](#) we also documented that the change in the real interest rate in Japan since 2012 has been much smaller than that which occurred in the U.S. after 1933. Furthermore, lower real interest rates in the U.S. occurred against a backdrop of other policy changes such as financial reform, public works programs, and new regulations for businesses.<sup>26</sup> And the 1933 regime change in the U.S. occurred after a precipitous fall in output and prices.

These factors suggest that Abenomics, as is, is unlikely to substantially raise long-run output in Japan. However, the “as-is” qualifier is important, since neither the monetary arrow nor the structural arrow appear to (yet) be fully credible policies.

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<sup>25</sup>See [Wall Street Journal](#).

<sup>26</sup>For more on policies and outcomes in the U.S. after 1933, see [Romer \(1992\)](#), [Temin and Wigmore \(1990\)](#), and [Fishback \(2008\)](#) among many others.

## 5 Credibility and alternative policies

We documented in sections 2.1 and 2.2 that most indicators of inflation expectations in Japan remain well below 2%, and we argued that this likely reflected imperfect credibility. One possible explanation for this lack of credibility, discussed at length in Hausman and Wieland (2014), is that observers doubt the political will to continue large-scale quantitative easing. Another possibility is that observers doubt the effectiveness of quantitative easing. Insofar as there are doubts about the political will to achieve to 2% inflation, it was unfortunate that the Bank of Japan’s expansion of quantitative easing in October 2014 passed with only a 5 to 4 vote. By contrast, the decisive victory of Abe’s Liberal Democratic Party in the December 2014 parliamentary elections may have increased confidence that monetary easing will continue. And in spring 2015, two members of the Bank of Japan policy board stepped down (Ryuzo Miayo and Yoshihisa Morimoto) and were replaced by Yutaka Harada and Yukitoshi Funo, both of whom are viewed as more sympathetic than their predecessors to expansionary monetary policy.<sup>27</sup> The appointment of these new members did not, however, lead to large changes in inflation expectations, suggesting that there are other sources of the credibility problem.

Given that quantitative easing has not (yet) produced actual or expected 2% inflation, the Bank of Japan could consider following Denmark, the Eurozone, and Switzerland in paying negative nominal interest rates on reserves. Buiter (2009) and Kimball (2013) provide a discussion of the potential benefits of this policy. In the U.S., there is a concern that negative nominal interest rates could cause a run on systemically important money market funds by forcing them to “break the buck.” But in Japan the importance of money market funds is negligible; their importance is even less than in Europe. As of 2014, money market shares amounted to \$2.5 trillion in the U.S., €427 billion (\$467 billion) in the eurozone and ¥14 trillion (\$113 billion) in Japan. As a share of broad money this amounts to 18.3% in the U.S., 4.1% in the Eurozone, and 1.1% in Japan. This suggests that paying a negative interest rate on reserves might be a practical policy in Japan.

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<sup>27</sup>See [Wall Street Journal](#) and [Wall Street Journal](#). Harada is an economist who wrote a book entitled *Reflationist Economics Has Saved Japan*. Funo is a former Toyota executive. Since his appointment, he has spoken publicly in favor of the 2% inflation target ([Bloomberg](#)).

Negative nominal rates are only one of many alternative policies available to the Bank of Japan. For instance, as discussed by [Svensson \(2003\)](#), the Bank of Japan could deliberately weaken the yen and peg the yen at a weak value. While net exports have not responded strongly to the recent yen depreciation, it is plausible that a peg could increase these effects by persuading firms of the weak yen's permanence. Such a peg might also improve the credibility of the 2% inflation target. A practical difficulty is that exchange rate policy falls within the scope of the Ministry of Finance rather than the Bank of Japan, so that more explicit cooperation between them would be required.

We are hesitant to comment on more non-standard proposals, such as money-financed government expenditures or money-financed fiscal transfers. Our analysis above suggests uncertainty about what macroeconomic model applies to Japan. This implies uncertainty about how alternative policies would affect inflation and output.

## 6 Conclusion

This brief paper reviewed recent developments in Japan. Our analysis of Abenomics, and monetary policy in particular, suggests that its real effects so far have been small despite intermediate indicators, such as the real interest rate and the real exchange rate, moving in an expansionary direction.

We focussed less on the third arrow, structural reforms, in part because relatively little reform has yet occurred and in part because professional forecasts suggest little is expected. Since late 2013, growth forecasts have declined ([figure 6](#)) while inflation expectations have slightly risen ([figure 2\(b\)](#)). This is the opposite of the expected pattern if structural reforms were seen as becoming more likely. In many standard macroeconomic models, structural reforms would raise growth expectations while lowering inflation expectations. Thus one way to interpret stable inflation expectations and declining growth expectations is as evidence that the probability that structural reforms will happen has fallen.

That is the bad news. Good news may come in the form of the Trans-Pacific Partnership. This trade agreement would mean the liberalization of Japan's highly protected agricultural

sector with a resulting large decline in food prices (Posen, 2014). Further, there are no lack of positive reforms available to Japan. For instance, the IMF (International Monetary Fund, 2015) estimates that reforms to increase the labor force participation of women and older persons could raise potential GDP growth by 0.25 percentage points per year. And Haidar and Hoshi (2014) provide many examples of high return and low cost reforms to regulations on new and existing businesses. While such reforms are undoubtedly politically difficult, without them Abenomics may do little for long-run growth.

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# APPENDIX

## A Data appendix

**Balance of Payments data:** Bank of Japan/Ministry of Finance

([http://www.mof.go.jp/english/international\\_policy/reference/balance\\_of\\_payments/ebpnet.htm](http://www.mof.go.jp/english/international_policy/reference/balance_of_payments/ebpnet.htm)).

**Bank of Japan JGB holdings:** Bank of Japan series BJ'MA03021034S.

**Bank of Japan real export and import series:** Bank of Japan series BP'BP180110001 and BP'BP180110002.

**CPI:** We use the official data from the Japanese Statistics Bureau

(<http://www.stat.go.jp/english/data/cpi/>).

**Employed population age 15-64:** OECD series LFEM64TT.

**Exchange rate – nominal:** We use the Bloomberg series, USDJPY.

**Exchange rate – real:** Bank for International Settlements trade-weighted index. We use the broad index including 61 countries.

See <http://www.bis.org/statistics/eer/>.

**Female employment to population ratio:** OECD series LFEM64FE (employment) and OECD series LFWA64FE (population).

**Government bond yields:** We use the Bloomberg series GJGBX where X is the years to maturity.

**Hours and employment data:** Data are from the Monthly Labour Survey from the Ministry of Health, Labor and Welfare

(<http://www.e-stat.go.jp/SG1/estat/List.do?lid=000001137658>). (Table list is in Japanese, but the tables themselves are in English.)

**Inflation swaps:** We use the Bloomberg series JYSWIT2, JYSWIT10.

**Money market interest rate:** IMF, International Financial Statistics.

**Money market fund size:** Japan: Bank of Japan series code FF'FOF\_FFAS162A900. Eurozone: ECB Monetary Statistics. U.S.: Federal Reserve H.6. release.

**Multifactor productivity:** OECD StatExtracts, multifactor productivity table.

**Nominal and real earnings:** Data are from the Monthly Labour Survey from the Ministry

of Health, Labor and Welfare

(<http://www.e-stat.go.jp/SG1/estat/List.do?lid=000001137658>). (Table list is in Japanese, but the tables themselves are in English.)

**Real GDP and GDP deflator:** Official Japanese real GDP are available from the Japanese Cabinet office (<http://www.esri.cao.go.jp/en/sna/menu.html>). These data begin in 1994. Prior to 1994, we use the real GDP index from the IMF's International Financial Statistics. We ratio splice this series to the official series in 1994.

**Stock market:** We use Nikkei 225 data from Yahoo finance and Topix data from the Bloomberg series TPX.

**Trade values and quantities:** The Ministry of Finance, Trade Statistics of Japan. See [http://www.customs.go.jp/toukei/shinbun/happyou\\_e.htm](http://www.customs.go.jp/toukei/shinbun/happyou_e.htm).

**Unemployment rate:** We use the OECD series LRUNTTTT for annual unemployment. The current monthly number is from Statistics Japan, <http://www.stat.go.jp/english/data/roudou/results/month/index.htm>.

**Working age employment to population ratio:** OECD series LFWA64TT (for population) and LFEM64TT (for employment).

**U.S. data in table 1:** Real GDP: Federal Reserve Bank of St. Louis, FRED database series GDPCA. Other series as above.

**U.S. GDP growth after 1933:** NIPA table 1.1.6A.

**A.1 Real Imports and Exports Data under Balance of Payments Revision** Beginning in 2014, the Balance of Payments Statistics were revised to align with the guidelines of the International Monetary Fund's *Balance of Payments and International Investment Position Manual*, 6<sup>th</sup> edition. This led to some reclassification of items between goods and services and between the current and capital account. We know of no quantitative estimate of the effect of this reclassification on the real import and real export figures. But three pieces of evidence suggest that this reclassification does not change the broad story of rising real export and import volumes.

First, an alternative series on real merchandise exports and imports from the Bank of Japan also shows increases in real exports and imports. Between the fourth quarter of 2012 and the second quarter of 2015, it shows real exports rising 6.3% and real imports rising 5.4%. Second, removing the change in real imports and real exports from 2013:Q4 to 2014:Q1 from our calculation, one sees a 9.3% increase in real exports and a 5.3% increase in real imports from 2012:Q4 and 2015:Q2. This adjustment almost certainly provides a lower bound for the actual increase in imports, given the large increase in consumption in 2014:Q1 in advance of the April consumption tax increase.

Finally, although (to our knowledge) no consistent series for real exports and imports exist across 2013 and 2014, Japan does publish a consistent series for the *nominal* value of goods imports and exports for this period. We compare this series to the equivalent nominal series from the national accounts which suffers from the data reclassification problem. The correct data show an increase in nominal goods exports from 2013 to 2014 of 9.2% and of goods imports of 10.3%. The national accounts show increases of 9.6% and 10.5%—reassuringly similar. To our knowledge the equivalent data for services are unavailable. Thus we are left more uncertain about the extent to which the services data may have been affected by reclassification. However, services only account for approximately one-quarter of the total increase in imports from 2013 to 2014, so even substantial changes in the services classification could not explain the large increase in real imports under Abenomics. Furthermore, even excluding the change from 2013:Q4 to 2014:Q1, real service imports rose 18.8% over the entire period of Abenomics, from 2012:Q4 to 2015:Q2.

## **B Phillips curve estimates**

Table 2 – Phillips Curve estimates

| Dependent variable: Inflation minus expected inflation $\pi_t - E_t\pi_{t+1}$ |                   |                 |
|---|-------------------|-----------------|
|   | OLS<br>(1)        | IV<br>(2)       |
| $\pi_{t-1} - E_t\pi_{t+1}$  | 0.22<br>(0.15)    | 0.11<br>(0.18)  |
| Output Gap  | 0.14**<br>(0.053) | 0.13<br>(0.091) |
| p-value: vertical PC  | 0.38              | 0.59            |
| F-stat  |                   | 9.32            |
| $R^2$   | 0.18              | 0.12            |
| Observations  | 27                | 24              |

Notes: Estimation of  $\pi_t - E_t\pi_{t+1} = \beta_1(\pi_{t-1} - E_t\pi_{t+1}) + \beta_2x_t + \varepsilon_t$  using OLS and IV. Instruments are a lag of the output gap  $x_{t-1}$  and  $\pi_{t-1} - E_{t-1}\pi_{t+1}$ . Testing for a vertical Phillips curve is the t-test on  $\beta_3$  in the equation  $\pi_t - E_t\pi_{t+1} = \beta_1(\pi_{t-1} - E_t\pi_{t+1}) + \beta_2x_t + \beta_3E_t\pi_{t+1} + \varepsilon_t$ . Newey-West standard errors in parenthesis.

## C A consumption choice model

A household maximizes expected discounted utility subject to a sequence of budget constraints and the accumulation constraint for the storable nondurable good,

$$\begin{aligned}
& \max \mathbb{E} \sum_{t=0}^{\infty} \beta^t [U(C_t, F_t) - v(N_t)] \\
\text{s.t. } \lambda_t : & C_t + \frac{P_t^Z}{P_t^C} Z_t + A_t = A_{t-1}(1 + R_t) + \frac{W_t}{P_t^C} N_t \\
\nu_t : & S_t = (1 - \delta)S_{t-1} + Z_t - F_t \\
\kappa_t : & Z_t \geq 0 \\
\eta_t : & S_t \leq \bar{S} \\
\xi_t : & S_t \geq 0 \\
& F_t \leq (1 - \delta)S_{t-1} + Z_t.
\end{aligned}$$

$C_t$  is nonstorable, nondurable consumption bought at price  $P_t^C$ ,  $A_t$  are real bond holdings,  $R_t$  is the real interest rate,  $W_t$  is the nominal wage and  $N_t$  is labor supply. The storable nondurable stock  $S_t$  depreciates at rate  $\delta$  and can be replenished with purchases of the storable good  $Z_t$  at price  $P_t^Z$ . Consumption of the storable good  $F_t$  depletes the stock. We assume that storable good purchases and their stock cannot be negative (no shorting), and that there is a maximum

storage capacity  $\bar{S}$ .

The household takes the sequence of relative prices, real wages and real interest rates as given. The first order conditions for the household are then given by

$$U_{C,t} = \lambda_t \tag{3}$$

$$U_{F,t} = \nu_t \tag{4}$$

$$v'(N_t) = \frac{W_t}{P_t^C} \tag{5}$$

$$\lambda_t = \beta \mathbb{E}[(1 + R_{t+1})\lambda_{t+1}] \tag{6}$$

$$\nu_t + \kappa_t = \lambda_t \frac{P_t^Z}{P_t^C} \tag{7}$$

$$\nu_t = \beta(1 - \delta)\nu_{t+1} + \xi_t - \eta_t \tag{8}$$

In steady-state with  $\frac{P_t^Z}{P_t^C} = 1$  and  $1 + R \geq 1 - \delta$  the household will not hold any stock of storable goods, so  $\nu = 0$  and  $S = 0$ . The household will simply purchase storable goods as needed,  $F = Z$ , because the storing technology is too expensive relative to the return on saving.

However, if the real interest rate  $1 + R_{t+1}$  temporarily drops below  $1 - \delta$ , then the household will optimally accumulate storable goods up to the capacity constraint  $\bar{S}$ . This is likely to happen just before a consumption tax increase when prices jump discretely, and when nominal interest rates are zero. In that case  $1 + R_{t+1}$  will be temporarily negative because future consumption is more expensive. Further, by shortening the time-horizon (e.g., to days rather than quarters) we can make  $1 - \delta$  arbitrarily close to one. Thus, just before the consumption tax causes a discrete price change, the condition  $1 + R_{t+1} < 1 - \delta$  is satisfied, and there will be a discrete change in the purchases of durables consumption.

By contrast, if a monetary expansion only smoothly changes the perceived path of real interest rates, the previous argument breaks down. It can be the case that  $1 + R_{t+1} > 1 - \delta$  over the entire transition path. Hence, the observed responses of Japanese households to the consumption tax and monetary policy are not inconsistent.