Perspectives on the Staff Outlook for PCE:
Baseline Forecast, Uncertainty, and Some Specific Risks

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Introduction

In the September Tealbook projection, real consumer spending (PCE) accelerates noticeably from 2 percent growth in 2012 to 3¾ percent growth in 2015. In turn, the acceleration in real PCE is a key factor driving a similar acceleration in real GDP and the eventual restoration of real GDP to its potential level over the medium term. In light of the importance of the outlook for PCE to the overall GDP forecast, this memo examines the considerations that inform our judgment about the baseline forecast, as well as the extent of uncertainty surrounding the baseline and some key questions about the outlook for consumer spending.

More specifically, in the remainder of this memo, we first briefly describe the recent behavior of aggregate consumption and the framework that we use to analyze and project consumer spending. Then, using this framework, we argue that the recent behavior of several important observable indicators points to a noticeable step up in consumption growth going forward. However, we also show that considerable uncertainty attends the staff's projections of real PCE growth and that in recent years our projection has been biased upward. (As of this writing, the projection for PCE growth in the second half of this year from the September Tealbook is again looking overly optimistic.) Finally, we discuss some key questions about the prospects for aggregate consumption with which we continue to wrestle.

The recent behavior of aggregate consumption

In the expansion prior to the recent recession, real PCE growth, shown in Figure 1, averaged nearly 3 percent, somewhat less than the 3½ percent average pace from 1970 to 2000, a moderation that we largely attribute to a slowing in the growth of the population and labor force. Then, in the recent recession, consumer expenditures declined 2¾ percent from 2007:Q4 to 2009:Q2, the largest cumulative drop since the early 1950s. Subsequently, consumption increased around 3 percent over the four quarters of 2010, before decelerating to a modest 2 percent pace in 2011, 2012, and the first half of this year.

Compared to previous business cycles, consumption growth in the most recent episode was lower both during the recession and during the ensuing recovery. This can be seen in Figure 2, which shows four-quarter consumption growth just prior to and following the cyclical peak in economic activity relative to average growth over the five years prior to the peak. The solid line shows consumption growth in the most recent period, and the dashed line shows the average performance since 1970 (excluding the recent episode). In a typical recovery, consumption

growth rises above the average pre-peak growth rate, but this has not happened in the current recovery.
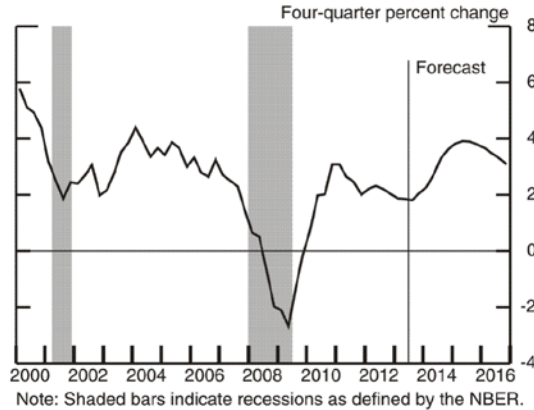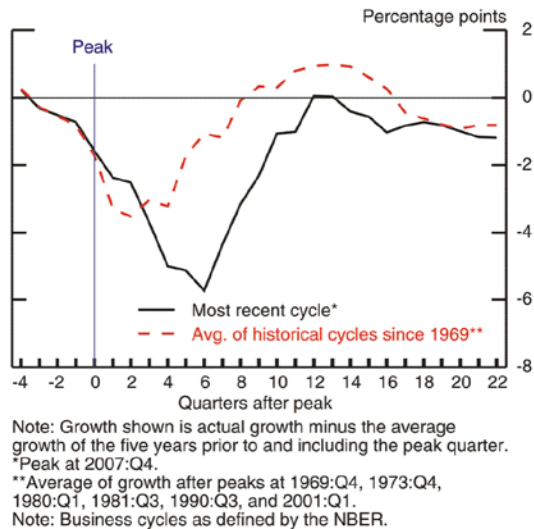
Figure 1. Real PCE Growth

Four-quarter percent change

Note: Shaded bars indicate recessions as defined by the NBER.

Figure 2. Cyclical Behavior of Real PCE Growth
(Four-quarter percent change relative to pre-peak average growth)

Percentage points

Note: Growth shown is actual growth minus the average growth of the five years prior to and including the peak quarter.
*Peak at 2007:Q4.
**Average of growth after peaks at 1969:Q4, 1973:Q4, 1980:Q1, 1981:Q3, 1990:Q3, and 2001:Q1.
Note: Business cycles as defined by the NBER.

Staff framework

The staff's approach to modeling aggregate consumption is fairly eclectic and attempts to incorporate the most important insights about consumer behavior from the consumption literature. Our general framework is summarized in the table below. The left-hand column lists the important economic determinants of aggregate consumption, and the right-hand column lists the observable indicators, or proxies, we use to try to capture each influence empirically.

Table 1. Summarizing the Staff Framework

| Economic Determinants	Observable Indicators (Proxies)
1. Permanent Income	
Household assets	Household net worth, equity prices, house prices
Expected lifetime income	Personal income, consumer sentiment, fiscal policy (taxes and transfers), staff estimate of potential output, unemployment rate
2. Credit constraints	
Change in credit availability	SLOOS, credit card mail volume
Change in collateral or current income	Housing wealth, fiscal policy (taxes and transfers), current income growth
3. Uncertainty	Consumer sentiment, unemployment rate
4. Interest rates	Federal funds rate, auto loan rate

To put the staff framework in more concrete terms, we display the equations and estimated coefficients of one of our forecasting models below.

$$C_t = .66 * DPI_t + .03 * W_t + .38 * T_t + \varepsilon_t$$

$$\Delta \log C_t = .14 * \left(\hat{C}_{t-1} - C_{t-1} \right) + .20 * \Delta \log DPI_t + \Delta \log potgdp_t + .02 * ICS_t$$

$$- .6 * \Delta ur_t + .007 * SLOOS_t - .05 * rff_{t-1} - .17 * \Delta \log C_{t-1} + \eta_t$$

C is the level of real consumption, DPI is real disposable personal income, W is real household net worth, T is real transfer payments, $\hat{C}$ is the predicted level of consumption from the first equation, $potgdp$ is the staff's estimated level of potential output, ICS is the index of consumer sentiment from the Michigan survey, ur is the unemployment rate, SLOOS is the diffusion index of responses to a Senior Loan Officer Opinion Survey (SLOOS) question about whether banks have become more or less willing to make consumer installment loans, rff is the real federal funds rate, and ε and η are residuals. Figure 3 compares a simulation of the model jumping off of the first quarter of 2000 to actual consumption growth through the second quarter of this year and to the staff projection thereafter.

Figure 3. Model Simulation of Real PCE Growth

*Model jumps off 2000:Q1.
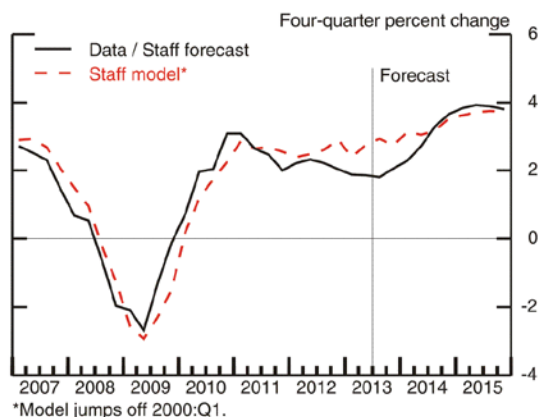
The first equation of the model relates the level of consumption to levels of wealth and income.[1] The second equation relates the log difference of consumption to several observable indicators, including the lagged difference between the fitted value of consumption from the first equation and actual consumption. The positive estimated coefficient on this term implies that when the predicted level of consumption is different from actual consumption, consumption tends to move toward the level implied by wealth and income. As a result, increases in the levels of wealth or income (that are not immediately reflected in consumption) are projected to lead to gradual increases in the level of consumption (and thus higher growth rates for several quarters).

The current growth rate of income also appears on the right hand side of the second equation and its influence on consumption likely reflects the presence of rule-of-thumb consumers, the tendency for credit constrained households to respond strongly to contemporaneous changes in income, and changes in permanent income (to the extent that these changes not captured by potential output growth).[2] The model's inclusion of the level of, and change in, DPI is a good first step in trying to capture the influence of expected lifetime income, but these measures have significant measurement error and cannot account for changes in the relationship between current income and expected future income. As a result, we supplement the published data on DPI with our estimate of the current growth rate of potential output, constraining its coefficient to equal 1, and the ICS, an equally weighted average of five survey questions about current and expected future economic conditions.[3]

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[1] When estimating this equation, we relate the ratio of consumption to DPI to a constant term, the ratio of net worth to DPI and the ratio of transfers to DPI.

[2] By rule-of-thumb consumers, we mean consumers who consume their current income every period, see Campbell and Mankiw (1989). Precautionary saving, see Zeldes (1989), or buffer stock saving, see Carroll (1997), can also lead consumers to respond strongly to contemporaneous changes in income.

[3] As in any econometric equation, it is only the variation in the ICS that is orthogonal to the other determinates of consumption spending, including wealth and income, that is reflected in the coefficient estimate relating the ICS to PCE growth. Three of the five questions included in the ICS concern expectations of future business and personal financial conditions, and two relate to the current economic situation. The fact that the ICS appears to have greater

The ICS is also likely correlated with changes in household uncertainty about the economic outlook, as are changes in the unemployment rate. Increases in uncertainty can lead households to reduce consumption and save more out of their current incomes for precautionary reasons. Downside tail risks to the economy—an important source of economic uncertainty—are likely reflected in survey questions about the economic outlook contained in the ICS, while the possibility, and potential cost, of future job loss—an important source of income uncertainty for many households—are likely reflected in the unemployment rate.

Changes in credit constraints can also influence consumption growth. For example, the severe tightening of these constraints following the financial crisis likely had significant effects on consumption. In our models, this influence is captured by the diffusion index from the SLOOS. Finally, the real federal funds rate is intended to capture the influence of interest rates on consumption growth.[4]
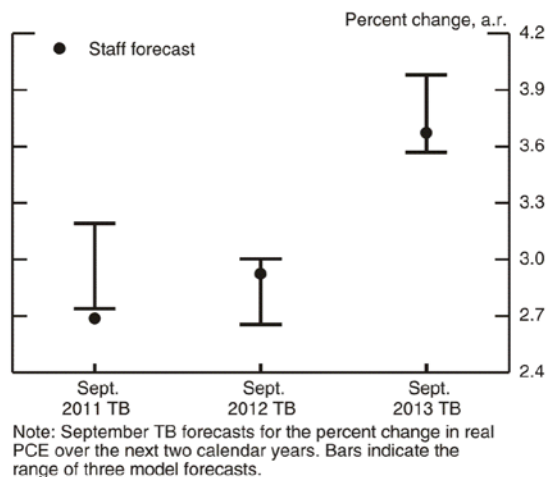
We note that there is not always a one-to-one mapping from observable indicator to economic determinant. For example, as shown in Table 1, the relationship between consumer sentiment and aggregate consumption likely reflects both sentiment's correlation with permanent income and its correlation with economic uncertainty. Similarly, the effect of house prices on consumption likely reflects both the relationship between housing wealth and permanent income and the ability of greater housing wealth to loosen credit constraints. While we regard table 1 as a useful framework for thinking about the relationship between observable indicators and aggregate consumption, we also recognize that it is difficult to identify the specific channels through which each observable variable affects consumption, and that the actual relationship between an observable variable and aggregate consumption can be quite complicated.

Because it is not clear which observable indicators most accurately reflect the determinants of consumption, the staff consults several models based on the above framework. These models provide a range of forecasts of PCE growth. For example, the range of model-based projections of the annualized rate of PCE growth for the following two calendar years at the times of the 2011, 2012, and 2013 September Tealbooks is shown by the vertical lines in Figure 4. While staff projections, the solid dots, are informed by the model simulations, they are not tied to any of them, and, as shown by the September 2011 projection, can, at times, be outside the models' range.

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information (after conditioning on wealth and income) than responses to purely forward looking survey questions could be because the current component of the ICS helps to control for transient movements or measurement error in wealth and income.

[4] The federal funds rate likely influences consumption growth through its correlation with short to medium term interest rates—which affect the user cost of consumer durables and incentives to save—and through its correlation with expectations of future income growth. In other models, we include the real auto loan rate instead of the real federal funds rate.

Figure 4. Range of Model Projections in Recent Years

Note: September TB forecasts for the percent change in real PCE over the next two calendar years. Bars indicate the range of three model forecasts.

Explaining the projected acceleration in consumption

In the September Tealbook, we projected real PCE growth to pick up from 2 percent in 2012 to 3¾ percent in 2015, an acceleration of 1¾ percentage points. The top line of Table 2 shows the acceleration in each year of the projection and the cumulative acceleration over 2012 to 2015. The rest of the table shows the contributions to this acceleration from several of the indicators listed in the right-hand column of Table 1, as interpreted by the staff framework. The contributions shown in the table reflect both the recent behavior of the relevant indicators and their expected future behavior after excluding the influence of an endogenous multiplier, which we account for separately. Overall, these indicators currently suggest more robust growth in permanent income than in the recent past, as well as a reduction in uncertainty about the economic outlook. Specific contributions are discussed below.

- Household net worth contributes ½ percentage point to the acceleration in consumption from 2012 to 2015, as prices of corporate equity and housing have increased about 18 percent and 12 percent, respectively, over the past year.[5] Although we expect gains to moderate going forward, we still anticipate that total household net worth will rise from $69 trillion in 2012 to $85 trillion in 2015, an increase that is larger in magnitude than the precipitous drop in wealth from 2007 to 2009.[6]
- Real income growth—excluding the effects of fiscal policy (which we account for separately) and smoothing through the considerable volatility at quarterly frequencies— appears to have stepped up over the past year and a half, averaging an annual rate of

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[5] The projected slowing in the pace of asset price increases implies that the boost to PCE growth from asset prices diminishes in 2015, leading to a negative contribution of asset prices to the *acceleration* in consumption in 2015.
[6] As indicated in the model equation shown above, the staff estimates that an additional dollar of wealth eventually increases the level of consumption by a little over 3 cents.

about 2½ percent in 2012 and the first half of this year, up from about 1 percent in 2011. We expect the stronger pace of income growth in recent quarters to contribute to an acceleration in PCE this year. Thereafter, income is not expected to have an exogenous effect on PCE. Instead, we expect the increase in consumer spending caused by the other factors in the table to boost household income and engender secondary, or multiplier, effects on consumption. These multiplier effects are an important contributor to the acceleration in consumer spending after 2013.

Table 2. Decomposing the Acceleration of PCE in the September Tealbook (Q4/Q4)
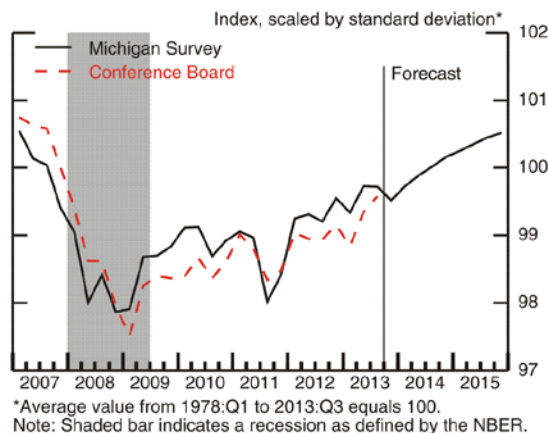(Percentage Point Contribution to Acceleration in Real PCE)

	2012-2013	2013-2014	2014-2015	2012-2015
Total	0.4	1.2	0.2	1.8
Net worth	0.5	0.2	-0.2	0.5
Income/Multiplier	0.2	0.4	0.2	0.8
ICS (consumer Sentiment)	0.1	0.2	-	0.3
Fiscal policy (taxes and transfers)	-0.6	0.3	0.2	-0.1
Potential output (capital stock growth)	0.2	0.1	-	0.3

Note. "-" denotes no contribution to acceleration.

- As shown in Figure 5, consumer sentiment, as measured by the ICS, has increased noticeably in recent quarters, suggesting that consumers are becoming more confident of continued improvements in economic activity and less concerned about downside risks to the overall economy and to their own household incomes.[7] In the September Tealbook, we extrapolated this improvement forward and, as a result, improving consumer sentiment contributes about ¼ percentage point to the projected acceleration in consumption over the medium term.

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[7] Moreover, this gain had been mirrored by improvements in expectations of real and nominal income gains in the Michigan survey and by increases in confidence indexes published by the Conference Board, Gallup, and Rasmussen. That said, most of these measures have moved lower since August, a development which may, at least in part, reflect the recent fiscal stalemate.

Figure 5. Household Sentiment

*Average value from 1978:Q1 to 2013:Q3 equals 100.
Note: Shaded bar indicates a recession as defined by the NBER.

- Regarding fiscal policy, the expiration of the payroll tax cut and an increase in marginal tax rates for high income households lowered disposable income at the beginning of this year. Although we can measure the effect of fiscal policy on income fairly accurately, we have considerably less precise measures of the magnitude and timing of the effects of the associated income changes on consumption. Our best guess is that these tax increases pushed down PCE growth sharply in the first part of 2013 but that the resulting drag on PCE growth will gradually diminish going forward; this anticipated waning of the restraint from fiscal policy contributes ½ percentage point to the acceleration in PCE between 2013 and 2015.
- Modest projected increases in potential output growth, due to an expected increase in the growth rate of the capital stock, contribute about ¼ percentage point to the acceleration in PCE from 2012 to 2015.[8]
- Other indicators, on balance, contribute little to the acceleration in consumption, as the moderately negative effect of rising interest rates over the medium term is expected to be largely offset by modest improvements in households' access to credit.

Uncertainty surrounding staff projection and recent staff forecast errors

Although we think that our forecast of a significant acceleration in PCE is the most likely outcome, figure 6 shows that considerable uncertainty surrounds our projection. The solid line in the figure shows the September Tealbook projection of real PCE growth. The shaded area shows the 70 percent confidence interval around this projection based on Tealbook forecast errors over the past 20 years. Note that the 70 percent confidence interval encompasses an outcome in which consumption does not accelerate at all. Notice also that there remains considerable uncertainty about PCE growth in the first and second quarters of this year even though the BEA

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[8] Because of the large and persistent reductions in investment during the recession, the level of investment relative to the capital stock is still relatively low, implying that growth in the capital stock is also relatively low currently. However, over the next couple of years, we expect continued moderate gains in investment to move growth in the capital stock back to a more normal level.

has published estimates for these quarters. The reason is that it is not unusual for the BEA to make large revisions to its previously published data.[9] Thus, while we cannot rule out the possibility that PCE will not accelerate at all going forward, we also cannot reject the possibility that it has already begun to accelerate significantly.

Figure 6. PCE Forecast Uncertainty

Note: Shaded region indicates 70% confidence interval, as defined by the errors between historical TBs (Nov. 1993 to Sep. 2013) and current data.
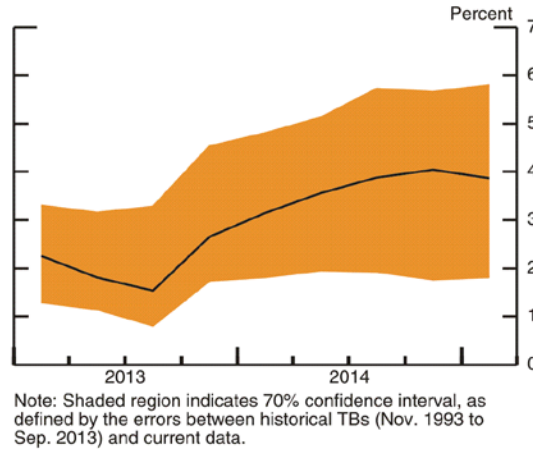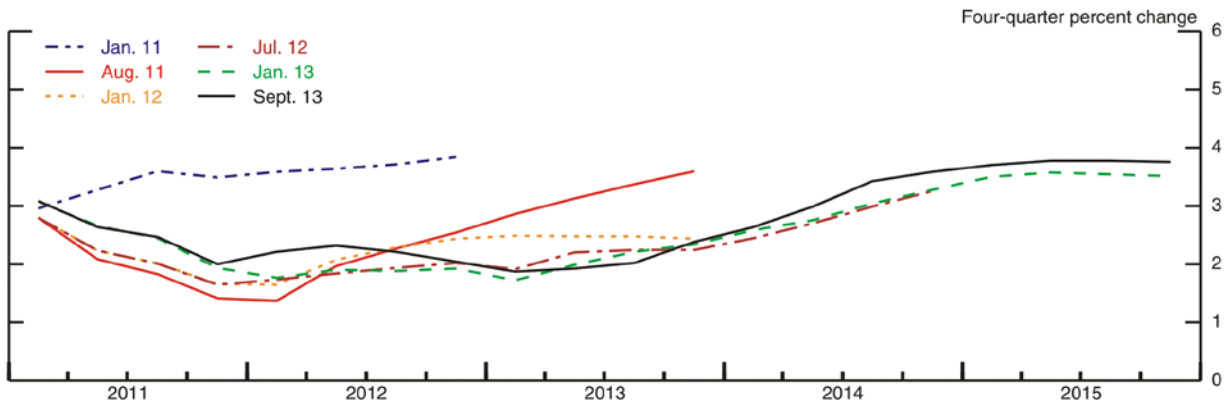
Figure 7. Evolution of the Staff PCE Forecast

Next, we consider the recent pattern of staff forecast errors. Figure 7 shows the evolution of our Tealbook projections of PCE growth from the January 2011 Tealbook (the dot-dashed blue line) to the September 2013 Tealbook (the solid black line). The figure shows that since the beginning of 2011, growth has generally come in weaker than we had expected. At the beginning of 2011, we expected PCE, which had increased a little over 3 percent in 2010, to strengthen further over 2011 and 2012. When the data came in considerably weaker than expected, we marked down our projection of PCE growth in 2011 and 2012, but expected that by

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[9] The BEA's revisions also include conceptual changes, e.g. the recent revision to include intangible capital in business fixed capital, but our sense is that since 1993, revisions to PCE growth have been largely due to the incorporation of better data and measurement methodology rather than to changes in the concept or definition of PCE.

2013 consumption would grow more rapidly. However, with the arrival of more data, we have also over time steadily reduced our projection of PCE growth in 2013.

To explore the forecast misses after 2010 in more detail, we distinguish between the component of our forecast error due to mistaken assumptions about the behavior of observable indicators and the remaining component, which can be thought of as the residual, and which likely reflects surprises specific to aggregate consumption rather than to the broader economy. In this analysis, we use the October 2010 Tealbook projection of PCE growth over the 8 quarters of 2011 and 2012 as our baseline. Over this period, we predicted that PCE would rise 7.5 percent, whereas it actually increased only 4 percent (a forecast error of 3½ percentage points). If we had accurately projected the values of our indicator variables (asset prices, income, consumer sentiment, etc.), our forecast error would have been about 1¾ percentage points.[10] Thus, half of our forecast error over this period owed to our inability to predict the evolution of the key determinants of consumer behavior (most notably potential output, DPI, and consumer sentiment), and half owed to other shocks to consumption not captured by our modeling framework.

Key Questions about the Outlook for Consumption

The size of our past forecast errors (and the fact that a substantial portion of these errors does not owe to our inability to predict conditioning variables) indicates that there are many economic developments that are not well captured by our modeling framework and that have important effects on aggregate consumption. As a result, when putting together our forecast, we ask ourselves what developments beyond the ken of our models might affect the behavior of aggregate consumption going forward. Below we briefly describe some of the questions we are wrestling with.

Will the rise in house prices have a strong effect on PCE?

Neither theory nor empirical estimates provide clear guidance about the magnitude of the effect of housing wealth on consumption. Theory suggests that housing wealth can increase consumption by raising the value of households' net worth and permanent income. In addition, an increment to housing wealth can raise consumption by relaxing credit constraints faced by some households (the collateral effect). However, because we cannot observe the extent to which current homeowners are credit constrained, theory offers relatively little guidance about the magnitude of the collateral channel's effect on consumption. Unfortunately, empirical evidence also offers only limited guidance. Estimates of the average effects of changes in housing wealth on consumption have a fairly broad range, and there is very little evidence on

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[10] In making this calculation, we take into account the effect of surprises in the behavior of consumption on our projection of multiplier effects. For example, one of the observable variables we condition on is income. However, if consumption is inexplicably weak (given the actual value of indicator variables) then income going forward, through the multiplier, will also be weaker than expected. In our parsing, we include this indirect effect on income in our estimate of the portion of our forecast error due to mistaken assumptions about consumer behavior.

how the collateral channel is influenced by changes in the number of credit constrained households and the ability of households to obtain mortgage and home equity credit.[11]

The current state of the economy and mortgage markets adds to the uncertainty about the effect of house prices on consumption. On the one hand, because the economy has yet to recover fully from the recent recession, many homeowners likely view their permanent incomes as greater than their current incomes and would like to fund additional consumption by borrowing against the value of their homes. This suggests that consumption could respond strongly to any increase in house prices. On the other hand, lending standards and terms for mortgage credit are still quite tight. In addition, credit constrained homeowners who remain underwater following a house price gain will have no housing wealth to borrow against. As a result, many credit constrained homeowners may be unable to tap any increase in the value of their homes. Going forward, we expect both of these factors—an unusually large number of credit constrained households and unusually tight mortgage credit and elevated underwater mortgages—to move back toward more normal levels, but the pace of any reversion is difficult to assess. In sum, it is difficult to judge how strong the consumption response to house price increases currently is and whether it will become stronger or weaker over the projection period. For the purposes of putting together the staff forecast we assume a typical response, i.e. a little over 3 cents of additional consumption for every added dollar of housing wealth, but it could well be smaller or larger than this.

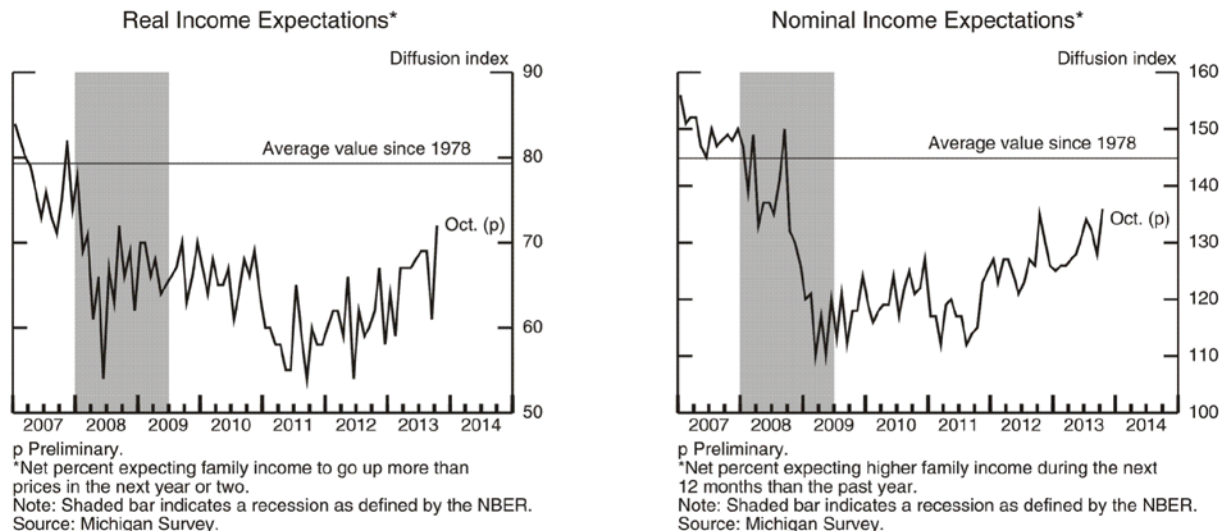*Has there been a fundamental shift in households' views about their economic prospects?*

It is possible that the Great Recession has made households more pessimistic and worried about the future, and that this more-pessimistic outlook will persist for quite some time. In support of this notion, some research has argued that recent economic events help shape individuals' expectations of future economic developments, particularly for young people who do not have a long personal history of economic experiences to draw on.[12] Thus, the financial crisis and very slow recovery may be causing many households to place relatively high probabilities on the possibility of large asset price declines and to expect weak income growth. Indeed, as Figure 8 shows, income expectations stayed depressed for an extended period after the recent recession, and while they have moved up from their earlier lows, they remain well below longer run averages; moreover, it is possible they could remain relatively depressed for some time. If so,

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[11] The most relevant studies for the staff projection are those using U.S. data on aggregate consumption. Unfortunately, relatively few studies of this type exist. Carroll, Otsuka, and Slacalek (2011) model the relationship between changes in aggregate consumption and changes in house prices and find relatively large house price effects (9 cents of consumption for every additional dollar of housing wealth) and a larger effect on consumption from housing wealth than from other types of wealth. In contrast, the staff, which models the relationship between the ratio of housing wealth to income and the ratio of consumption to income, estimates a considerably smaller effect that is not significantly different from other types of wealth. Estimates of the effect of an extra dollar of housing wealth on consumption from the more numerous studies using micro or disaggregated panel data from the U.S. and other countries have a central tendency of around 6 cents, with estimates ranging from close to 0 to nearly 10 cents.

[12] See Nagel (2012) and Malmendier and Nagel (2011).

household spending out of current income will be considerably lower than it might otherwise be. We have not made any special allowance for such an influence, but recognize that it represents a downside risk to our forecast.

Figure 8. Income Expectations

p Preliminary.
*Net percent expecting family income to go up more than prices in the next year or two.
Note: Shaded bar indicates a recession as defined by the NBER.
Source: Michigan Survey.

p Preliminary.
*Net percent expecting higher family income during the next 12 months than the past year.
Note: Shaded bar indicates a recession as defined by the NBER.
Source: Michigan Survey.

What are the effects of recent fiscal policy changes on consumption?

As noted above, we have only imprecise estimates of the magnitude and timing of the consumption effects of fiscal-policy-induced changes in income. Regarding the magnitude, much depends on expectations of households about future fiscal policy, which we cannot observe. For example, if households viewed the payroll tax cut as largely temporary, then they may not have adjusted spending very much in response to either the original tax cut or its expiration at the end of last year. In this case, the negative effect of the expiration of the tax cut this year could be considerably smaller than we currently assume, and underlying consumption growth (excluding the effects of fiscal policy) could be correspondingly weaker than we currently think. Regarding timing, in the baseline forecast we assumed a profile roughly consistent with the econometric equation we showed on page 3. But if households adjusted their consumption more quickly than that equation implies to the increase in taxes at the beginning of the year, then fiscal policy effects this year would be considerably more negative than we currently assume, and underlying consumption growth would be correspondingly stronger than we assume.

Will rising income and wealth inequality weigh on aggregate consumption?

It is possible that changes in the distribution of income or wealth are affecting the behavior of aggregate consumption, a development we have not allowed for in our baseline forecast. In particular, unusually large and persistent shifts in wealth or income toward households with low marginal propensities to consume (MPC) would likely result in persistent negative forecast

errors. In this regard, recent income gains have been concentrated at the top of the income distribution, and some research suggests that wealthier households have smaller average, and perhaps marginal, propensities to consume out of income.[13] However, the recent large gains for the top of the income distribution come after large declines for this group during the recession and may not be indicative of the concentration of income growth going forward. Moreover, income has been growing considerably faster at the top of the income distribution over the past 30 years, over which time our framework for modeling consumption has not had an obvious bias.[14] Thus, concentrated income gains in line with recent historical norms, by themselves, would not seem to pose an obvious downside risk to our projection. Still, it is possible that future gains in income and wealth may be even more concentrated than they have been in the past, and such an intensification of inequality trends may weigh on future consumption growth.[15]

Will the supply of credit to households and/or household attitudes toward debt provide less support to consumption growth than in the past?

The expansion of credit may have been an important support to consumption growth over the 30 years prior to the financial crisis.[16] But recent changes in household credit markets on either the supply or demand side may prevent credit markets from providing this level of support in the future. Regarding credit supply, certain lending markets, such as those for subprime mortgages, are not expected to return, while new legislation has made lending in some other markets more restrictive than before.[17] Regarding credit demand, the financial crisis and its aftermath may have fundamentally changed consumers' attitudes towards debt. As a result, both the future growth in household debt—and the support that this rising debt may provide to consumption growth—could turn out to be much lower going forward than over the 30 years leading up to the financial crisis.

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[13] See Saez (2013) for an estimate of the concentration of recent income gains. See Dynan, Skinner and Zeldes (2004) for an estimate of differences in average and marginal propensities to consume across households.

[14] Similarly, corporate equity wealth has always been concentrated among the wealthiest households, and thus this concentration should already be reflected in our estimates of the effect of wealth on consumption.

[15] Another concern related to both the distribution of recent housing wealth changes and the effect of house prices on consumption is that recent house price increases have tended to be strongest in states where a large proportion of households are underwater on their mortgages and are thus unable to borrow against any increase in housing wealth, suggesting a limited consumption response. However house price gains over the past year have still been fairly broad based, with prices rising over 5 percent in about two-thirds of Metropolitan Statistical Areas. Moreover, as noted above, the staff's estimated MPC out of housing wealth is not large, and most of the ½ percentage point acceleration in consumption that we attribute to net worth is due to equity prices, not house prices.

[16] While cyclical changes in credit supply play an important role in the staff framework, we lack high-quality measures of secular changes in credit supply. Carroll, Slacalek and Sommer (2012) and Duca and Murphy (2012) estimate that credit supply increased significantly over the 30 years prior to the most recent recession, but their estimates are based on the cumulative sum of qualitative responses to a question from the SLOOS on the willingness of banks to make consumer loans. Given the potential problems associated with the summing of diffusion indexes across time, we are hesitant to place great weight on these estimates.

[17] For example, the CARD Act substantially restricted the ability of lenders to conduct risk-based pricing, and some observers believe that rules regarding Qualified Mortgages will lead to persistently tighter underwriting standards for residential mortgages.

Could household deleveraging be holding back consumption growth?

An oft-cited reason for weak consumption growth since the financial crisis is continued deleveraging, which presumably denotes a negative influence of debt, outside of its effect on net worth, on consumption. However, convincing evidence of an independent influence of debt, as well as theoretical justifications of such an influence, are sparse. Instead, we suspect that to the degree that there is a correlation between debt and consumption growth, it is due to debt's correlation with more fundamental determinants of consumption.[18] In any event, the fact that the aggregate household debt-service ratio is hovering around its lowest level in 30 years suggests that household debt (again, distinct from the channel of overall net worth) is unlikely to be an important restraint on consumption going forward.[19]

Conclusion

The September Tealbook projects that consumption will accelerate noticeably over the medium term. This projection reflects the staff's view that recent indicators point to robust growth in permanent income and some reduction in households' uncertainty about the economic outlook. However, this projection is highly uncertain, and we cannot rule out the possibility that consumption does not accelerate at all or the possibility that consumption has already accelerated significantly and the current vintage of data do not yet reflect that fact. Areas of consumer behavior that pose considerable risk to the staff projection include the relationship between house prices and consumption, the extent to which household optimism has been affected by the recent recession, the effects of recent fiscal policy changes on consumption, the influence on aggregate consumption of shifts in the distribution of wealth and income, and the role that credit markets will play in supporting future consumption growth.

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[18] At the micro level, debt may be correlated with credit supply, changes in expectations of future income, and changing attitudes toward debt. At the macro level, debt may be correlated with these same influences, as well as with shifts in the distribution of wealth and/or income.

[19] It is true that greater debt increases households' exposure to changes in asset prices, and, thus, greater household debt likely increases the sensitivity of consumption to changes in asset prices.

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