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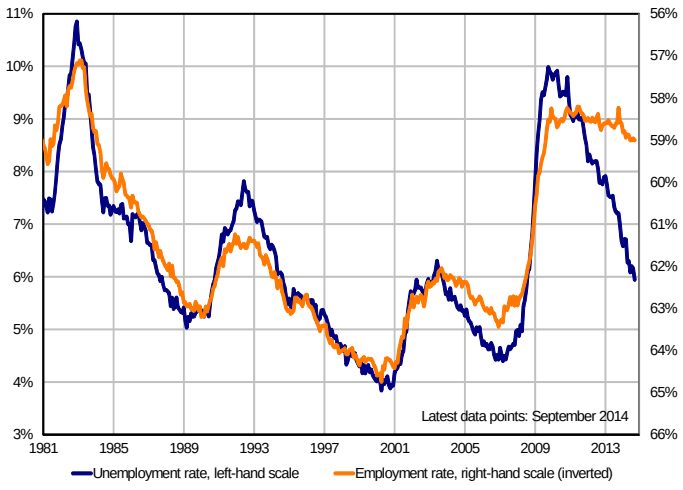
What's behind the United States' falling unemployment rate?

- The rapid fall in the United States' unemployment rate has been accompanied by a decline in the labour force participation rate that has accelerated since the crisis. After peaking at 10.0% of the labour force at the end of 2009, the unemployment rate has fallen steadily, reaching 5.9% in September 2014. Lower unemployment stems primarily from brisk job creation; however, it occurred against the backdrop of a decline in the labour force participation rate, which stood at 62.7% in September, its lowest level since 1978. A decline in the participation rate automatically caused a drop in the unemployment rate, whereas the employment rate showed little increase. This situation raises questions about the real situation on the US labour market.
- About half of the decline in the participation rate following the crisis can be explained by structural changes relating to demographics. Before the crisis, most of the large decline in the participation rate, which fell by 1.1 percentage points between 2000 and 2008, was due to baby-boomers taking retirement. Since then, the decline in the participation rate has accelerated, decreasing by 2.8 percentage points between 2008 and 2013. Demographic factors are estimated to account for approximately half of this decrease, or 1.1 percentage points.
- If we adjust for the demographic composition effects, the decline in the participation rate between 2008 and 2010 would appear to be a primarily cyclical phenomenon, but it now seems to be a more structural shift. During the crisis, the decline in the participation rate stemmed mainly from discouraged workers' temporary withdrawal from the labour force as the job market slumped (discouraged worker effects). Nonetheless, despite the US economy's recovery since 2010, the participation rate has continued to decline. The loss of human capital related to the lasting withdrawal of discouraged workers from employment makes their return to the job market less likely (hysteresis effects).
- Uncertainty about the structural component of the decline in the participation rate led the Fed to drop its reference to the unemployment rate in its forward guidance. The unemployment rate has systematically fallen faster than projected by the Fed since 2011. Consequently, at the Federal Open Market Committee (FOMC) meeting of March 2014, the Fed dropped the 6.5% unemployment rate target and adopted a wide range of indicators in its place.
- The participation rate is likely to continue falling as the population ages. This decline and slower population growth could lead to much slower growth of the United States' labour force. This could reduce the potential growth of the US economy in the long run and ultimately contribute to a lasting decrease in growth in the United States.

United States: Disconnect between the unemployment rate and the employment rate



Source: BLS - Household Survey.

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1. The unemployment rate is falling against the backdrop of a decline in the labour force participation rate, which has accelerated since the crisis

The unemployment rate in the United States has eased steadily since 2010, falling to 5.9% in September 2014. It is now far below the 6.5% threshold that the Fed set as a prerequisite for any increase in interest rates. New job growth has been strong, with the creation of more than 2 million new jobs per year, which resembles the job growth seen between 2004 and 2006.

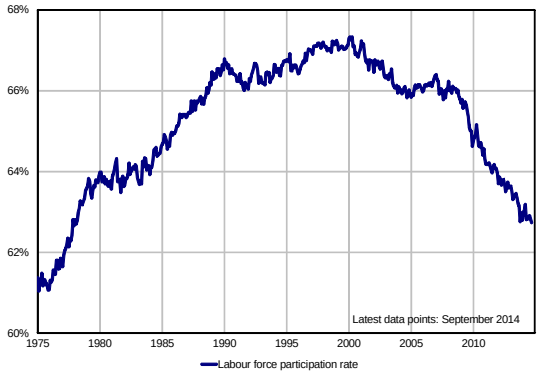
However, the employment rate[1] has posted only a tiny increase since 2010. After falling by 5.2 percentage points during the financial crisis, the employment rate has increased by only 0.8 points from its low in June 2011. The persistently low employment rate has led to much debate about the actual health of the US labour market. It also seems to raise questions about the reliability of the unemployment rate as a gauge of labour market slack[2].

This unusual disconnect between the unemployment rate and the employment rate stems from a huge drop in the labour force participation rate[3] in the United States (see Chart 1). The relationship between the unemployment rate and the employment rate can be written as:

$$\tau_{employment} = \tau_{participation} * (1-u)$$

where $\tau_{employment}$ is the employment rate, $\tau_{participation}$ is the participation rate and u is the unemployment rate. And yet, the labour force participation rate in the United States has declined since 2000, with a gradual decline of 1.1 points between 2000 and 2008, before a more rapid decline of 2.8 points between 2008 and 2013. T**he US participation rate is now at its lowest level in 36 years.**

Chart 1: Labour force participation rate in the United States



Source: BLS - Household Survey.

Box 1: **Is the decline in the participation rate temporary or permanent?**

If the decline in the participation rate is a cyclical phenomenon, then the accommodative stance of monetary policy should be maintained longer than the unemployment rate would suggest. On the other hand, if the decline is structural, it would bolster the case for using the unemployment rate as a gauge of labour market pressure, but with consequences for potential growth of the US economy. Therefore, it is critical to identify the causes of the declining participation rate and to understand whether it is temporary or permanent.

Four categories of explanations are usually put forward to explain the decline in the participation rate in the United States:

- A **cyclical** factor related to the **weak job market** in the United States following the crisis: this is the **discouraged worker effect**;
- **A structural factor, even though it is related to the crisis**, that stems from the p**ermanent effects of discouraged workers withdrawing from the labour market: this is the hysteresis effect**[a] that results from the loss of human capital associated with prolonged joblessness. Workers taking early retirement in a weak labour market also have an irreversible impact on the participation rate[b];
- A structural factor related to an **aging population** and **baby-boomers reaching retirement age**: this is the **demographic composition effect**, which has no connection to the economic situation;
- Other **structural** factors that have nothing to do with the crisis include young people spending more time in education and female labour force participation.

a. See Duval, R., M. Eris and D. Furceri (2010), "Labour Force Participation Hysteresis in Industrial Countries: Evidence and Causes," OECD.
b. See Lazear, E. (1987), "Retirement from the Labor Force," *Handbook of Labor Economics.*

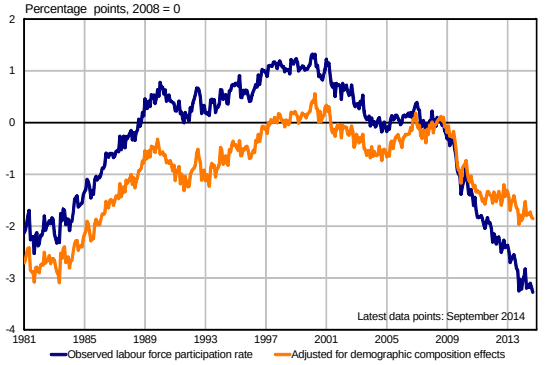
(1) The employment rate is the ratio between the number of jobs and the total population age 16 or older.
(2) Klitgaard and Peck (2014) stress that the divergence between the unemployment rates in the United States and the euro area could overestimate the differences in the performance of the two labour markets.
(3) The labour force participation rate is the ratio between the labour force and the total population age 16 or older.

2. Demographic composition effects are estimated to account for nearly half of the decline in the participation rate since the crisis

The overrepresentation of working-age cohorts in the aggregate population due to the baby boom contributed to a high labour force participation rate in the United States. But, since 1990, the retirement of the leading edge of the baby boom has driven down the US participation rate. The participation rate starts to decline after the age of 50, and then drops off sharply after the age of 60, which is the age that the first baby boomers born in 1946 reached in 2006. Their retirement makes an increasingly large negative contribution to changes in the US labour force participation rate.

The demographic composition effects on their own can explain nearly half of the 3.3-percentage-point drop in the participation rate seen since the start of the crisis (see Chart 2). When the participation rate is adjusted for demographic composition effects, it shows a decline of only 1.9 points since 2008 (see Box 2).

Chart 2: Demographics account for nearly half of the decrease in the participation rate since the crisis



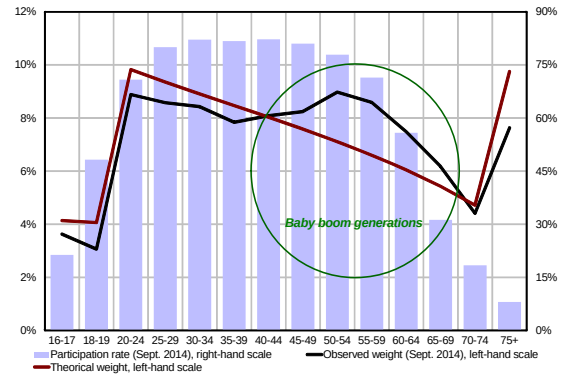
Source: BLS - Household Survey, DG Trésor calculations.

Box 2: **Measuring the demographic composition effect**

In order to measure the demographic composition effect, we devised a labour force participation rate adjusted for the demographic composition. We weighted the participation rate of each fine-grained age group by the theoretical weight that the age group should have in the population (see Chart 3), given the population growth[a] and mortality rates observed in a specific year (2009 in this case, the last year for which this data is available) (see Table 1).

We observe a distinct bulge in the 50-to-69 age group in the US population in relation to the theoretical age structure. This bulge represents the baby-boom generations born in the United States between 1946 and 1964, when birth rates reached record highs. These generations contributed to a high participation rate in the United States into the 1990s and are now contributing to a sharp decline in that rate.

Chart 3: Deriving a participation rate adjusted for demographic composition



Source: BLS - Household Survey, DG Trésor calculations.

Table 1: Deriving a theoretical weighting for each age group

Age a (years)	a < 1 year	1 ≤ a < 2 years	2 ≤ a < 3 years	3 ≤ a < 4 years	4 ≤ a < 5 years	etc.	Total
Mortality rate	0.637%	0.043%	0.029%	0.022%	0.017%	-	-
Survival rate (a)	99.444	99.341	99.306	99.281	99.261	-	7851.475
Multiplicative coefficient with demographic growth of 0.886% (b)	1.000	0.991	0.983	0.974	0.965	-	-
Simulated population (a) x (b)	99.444	98.469	97.570	96.689	95.821	-	5624.476
Theoretical weighting	1.768%	1.751%	1.735 %	1.719%	1.704%	-	100.00%

Source: Centers for Disease Control and Prevention, BEA, DG Trésor calculations.

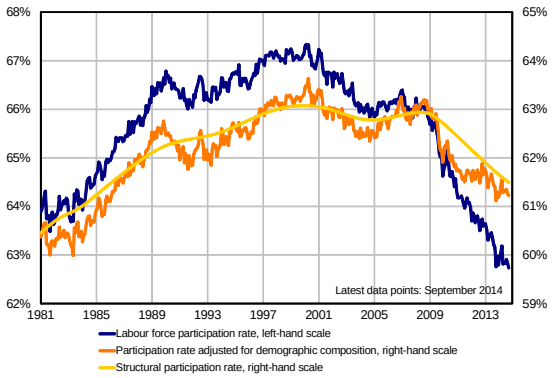
a. In these calculations, population growth was frozen at its 2009 value of 0.89% per year.

3. The decline in the participation rate seems to be increasingly structural

3.1 Discouraged worker effects appear to be playing a diminishing role in the decline in the participation rate

The decline in the participation rate seems to be increasingly structural as the crisis recedes and the job market improves. In order to distinguish hysteresis effects, which are permanent, from discouraged worker effects, which are transitory, we have estimated a structural participation rate. The participation rate adjusted for demographic composition effects converges on this structural rate when the unemployment rate is at its long-term level (see Box 3). The structural participation rate is estimated to have decreased by 1.4 percentage points since 2008 (see Chart 4).

Chart 4: The decline in the participation rate seems to be primarily structural today



Source: BLS - Household Survey.

Box 3: Estimating the structural labour force participation rate

The structural labour force participation rate is estimated using the following state-space model:

$$\begin{cases} \tau_t^c = \tau_t^* + \alpha\left(u_{t-7} - u_{t-7}^*\right) + \varepsilon_t & (1) \\ \tau_{t+1}^* = \tau_t^* + \mu_t + \beta\left(u_t - u_t^*\right) & (2) \\ \mu_{t+1} = \mu_t + \eta_t & (3) \end{cases}$$

where τ_t^c is the participation rate adjusted for demographic composition, τ_t^* is the structural participation rate, μ_t is the (variable) slope of the structural participation rate, u_t is the unemployment rate, u_t^* is the natural rate of unemployment[a], $\varepsilon_t \rightarrow N(0, \sigma_\varepsilon^2)$ is the residual of the measurement equation (1) and $\eta_t \rightarrow N(0, \sigma_\eta^2)$ is the residual of the transition equation (3). We also assume that $\sigma_\varepsilon^2 = \lambda\sigma_\eta^2$, where λ is fixed[b]. The number of lags applied to the unemployment rate was chosen to maximise the likelihood of the model. The model has been estimated for the period from January 1981 to September 2014. The results are very similar if a measurement of the output gap is used instead of the unemployment rate.

Thus, variations in the participation rate are proportional to the deviation of the unemployment rate from its natural level. The constant μ may vary over time to allow for changes in the participation rate trend. $\alpha(u_{t-7} - u_{t-7}^*)$ ris the discouraged worker effect, which affects only the cyclical component of the participation rate, whereas $\beta(u_t - u_t^*)$ denotes the hysteresis effect, which has a permanent impact on the structural participation rate. It is also noteworthy that, when α and β are fixed at zero, the trend-cycle decomposition obtained is a Hodrick-Prescott filter of parameter λ. Therefore, this model corresponds to a natural extension of the Hodrick-Prescott filter that explicitly accounts for the impact of unemployment on the cyclical and trend components of the participation rate. The estimated values of α and β are –0,16 and –0,0033 respectively.

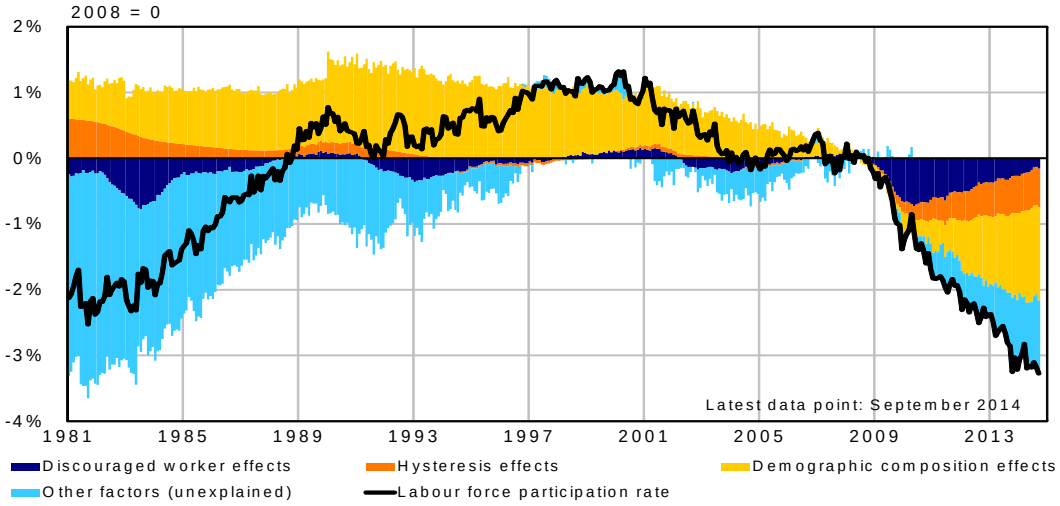
This model was inspired by a methodology developed by Lequien and Montaut[c] to estimate cyclically adjusted total productivity factors (TPFs). One of the drawbacks of these methodologies is the fragility of the results towards the end of the sample, which are likely to be revised in light of new observations.

a. Natural Rate of Unemployment, calculated by the Congressional Budget Office (CBO).
b. Hereafter, we choose λ = 129000 for the monthly data, in accordance with the recommendations of Ravn and Uhlig (2002): "On adjusting the Hodrick-Prescott filter for the frequency of observations."
c. Lequien, M. and Montaut, A. (2014), « Croissance potentielle en France et en zone euro : un tour d'horizon des méthodes d'estimation », *Working Paper*, Direction des Études et Synthèse Économiques, INSEE.

Discouraged worker effects explain most of the decrease in the participation rate seen in 2009 and 2010; however, its continuing decline, as the unemployment rate edges downwards, seems to be increasingly structural. The cumulative variation in the United States' labour force participation rate can be decomposed according to the different cyclical and structural causes under review (see Chart 5). In the years immediately after the crisis, discouraged worker effects explained most of the decline in the participation rate in the United States. Cyclical factors thus appear to have made a major contribution to the participation rate following the crisis, accounting for a decrease of up to 0.8 percentage points in 2011, but they contributed only 0.4 percentage points to the decrease in September 2014. **A large decrease in the unemployment rate appear to have reduced the role of cyclical factors in the decline in the participation rate.** As the unemployment rate neared the natural rate of unemployment, discouraged worker effects faded and the continuing decline of the participation rate appears to be more of a structural phenomenon.

A large part of the decrease in the participation rate between 2011 and 2013 cannot be explained by demographic factors or by the effects of the crisis (see Table 2). Hysteresis effects account for only half of the structural decrease in the participation rate. Between 2008 and 2013, hysteresis effects contributed only 0.5 percentage points to the cumulative decrease of 1.1 percentage points in the structural participation rate. Other structural factors seem to be at play and they cannot be captured by demographic composition effects or hysteresis effects alone.

Chart 5: Discouraged worker effects account for most of the decrease in the participation rate following the crisis



Source: BLS - Household Survey.

Table 2: The decline in the participation rate is now increasingly structural

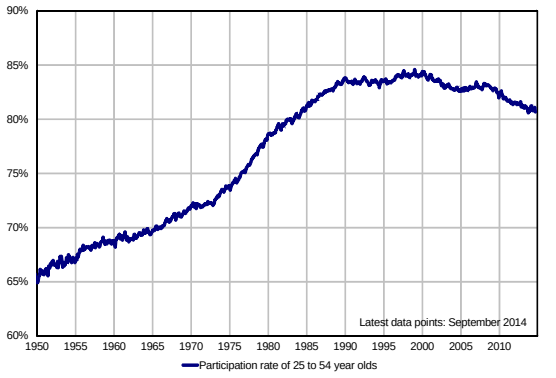
percentage points (2008 = 0)	2009	2010	2011	2012	2013
Cumulative change in the participation rate	−0.6	−1.3	−1.9	−2.3	−2.8
Demographic composition effects	−0.1	−0.3	−0.5	−0.9	−1.1
Hysteresis effects	−0.1	−0.2	−0.4	−0.5	−0.5
Other structural factors	0.0	−0.1	−0.2	−0.4	−0.6
Discouraged worker effects	−0.4	−0.7	−0.6	−0.4	−0.3
Other cyclical factors	0.0	0.0	−0.2	−0.1	−0.1

Source: BLS - Household Survey, DG Trésor calculations; latest data points: 2013.

3.2 Other structural factors seem to play a major role in the falling participation rate

After a major increase in the participation rate for 25-to-54-year-olds[4] related to women joining the labour force (see Box 4), the rate has declined since 2000, dropping by 3.1 percentage points between 1999 and 2013, even before the financial crisis (see Chart 6). The decline may be due to cultural changes, especially changing perceptions of the non-participation of men aged 25 to 54, as suggested by Bill McBride[5]. This author also mentions other possible explanatory factors, such as changes in the ethnic composition of the population[6] or the increase in employment in the underground economy. More analysis will be required to measure the impact of these phenomena on the US labour force participation rate. Finally, improved health coverage and cuts in inheritance taxes may also have had a minor impact on the incentives for labour force participation that was not one of the original objectives of these policies.

Chart 6: The participation rate of 25-to-54-year-olds has also declined since 2000



Source: BLS - Household Survey, DG Trésor calculations.

(4) In this case, the labour force participation rate is not adjusted for demographic composition effects. These effects have very little impact on the participation rate of the 25-to-54 age group.

(5) See the blog entry of 6 April by Bill McBride, "Possible Reasons for the Decline in Prime-Working Age Men Labor Force Participation" at Calculated Risk.

(6) The large increase in the proportion of "Black or African American Men", who have a lower participation rate, could lead to a decline in the aggregate participation rate.

The sizeable contributions of these other structural factors to changes in the labour force participation rate show that its decline does not depend solely on the economic situation. Their contributions reveal changes that occur over several decades, and not just over the business cycle. The decline in the participation rate since 2000 seems to be closely related to factors that have nothing to do with the crisis.

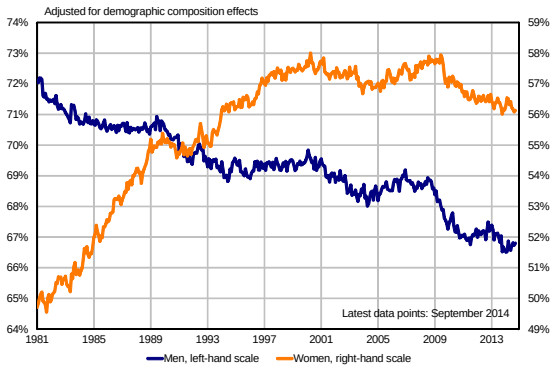
Box 4: **Women's labour force participation has stopped increasing and men's participation continues to decline**

The male labour force participation rate has been falling since 1981 (see Chart 7). Men's participation rate has decreased steadily for 30 years, falling by 0.13 percentage points per year, after adjusting for demographic composition effects. For men aged 25 to 54, the participation rate has been falling since the 1950s, even though young people staying in school longer and older people taking retirement are not factors for this age group. **However, the decline in the male participation rate accelerated substantially after 2008.** Between 2008 and 2013, the male participation rate fell by 1.8 percentage points, which was much faster than the previous rate of decline.

In contrast, the female participation rate increased rapidly up until 2000. When adjusted for demographic composition effects, the female participation rate increased by 7.7 percentage points between 1981 and 2000. **Since the crisis, the female participation rate has declined along with the male rate.** Female labour force participation stopped rising and is now declining slightly. However, the female labour force participation rate, adjusted for demographic composition effects, is still 10 percentage points lower than the male participation rate.

The decline in the male participation rate has been observed in most developed countries, but the decline in the female rate seems to be much more specific to the United States. The participation rate for females aged 25 to 54 is increasing in all of the other G7 countries, for example. And yet, it seems to be difficult to attribute these lasting changes to the very weak labour market following the crisis.

Chart 7: The decline in the participation rate now affects women, as well as men



Source: BLS - Household Survey, DG Trésor calculations.

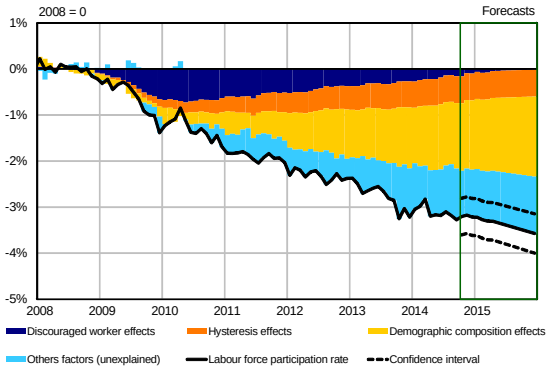
4. What does the future hold for the labour force participation rate in the United States and what is at stake?

4.1 Despite continuing improvements in the labour market, the participation rate should continue to decline in the United States

We foresee a continuing decline in the labour force participation rate in the United States, from 62.7% in September 2014 to 62.4% in December 2015 (see Chart 8). Our projections are based on the assumption that the unemployment rate will continue its steady decline to reach 5.5% in December 2015, in line with analysts' projections.

Demographic composition effects are expected to be the primary reason for this decline. When adjusted for demographic composition effects, the participation rate should be much more stable, owing to the discouraged worker effect as the unemployment rate falls. However, it is assumed that other structural factors will maintain their trend and should cause a slight decrease in the participation rate.

Chart 8: Despite discouraged worker effects, the participation rate should continue to decline



Source: BLS - Household Survey, DG Trésor calculations.

On the whole, our projections seem to be in line with the findings in the recent relevant literature. A BLS paper[7] projects that the labour force participation rate in the United States will fall by an average of 0.2 percentage points per year up until 2022. The CBO forecasts[8] show a more jagged trend, but the

(7) See (2013), "Labor force projections to 2022: the labor force participation rate continues to fall," *Bureau of Labor Statistics,* December.
(8) See (2014), "The Slow Recovery in the Labor Market," Congressional Budget Office, February.

average decline in the participation rate until 2024 still works out to 0.2 percentage points per year.

These forecasts highlight the importance of structural factors in the decline observed in the participation rate in the United States. Consequently, they buttress the findings of our econometric analysis.

4.2 Some 700,000 labour force non-participants could return to the labour market as the job situation improves

In September 2014, the complete clearing of the cyclical component of the declining participation rate (discouraged worker effects and other cyclical factors) could contribute to an increase in the participation rate of up to 0.3 percentage points, as some 700,000 non-participants to return to the labour market[9]. Our findings are in line with the BLS statistics: in September 2014, according to the BLS, 698,000 individuals were not included in the labour force because they were discouraged about the prospects of finding a job[10] .

If these temporary non-participants were counted as unemployed, the unemployment rate would increase by only 0.4 percentage points. This means that the unemployment rate is still a reliable indicator of labour market slack. Our findings are in line with those of Kapon and Tracy[11], who state that the decline in the unemployment rate reveals a real improvement in the US labour market, whereas the employment rate, which is affected by demographic composition effects, is a misleading indicator of the health of the US labour market.

4.3 Uncertainty about the labour market spurred the Fed to adapt its monetary policy messages

The problems in identifying the cyclical, and reversible, component of the declining labour force participation rate led to a more qualitative forward guidance approach. The fall in the unemployment rate, which has always been faster than the Fed's predictions since 2011, led to the elimination of any quantitative reference to the unemployment rate at the FOMC meeting of March 2014. The Fed is now tracking a wider panel of labour market indicators. This move is undoubtedly part of a return to normal monetary policy practices, where interest rates are set without explicit reliance on a single quantitative indicator.

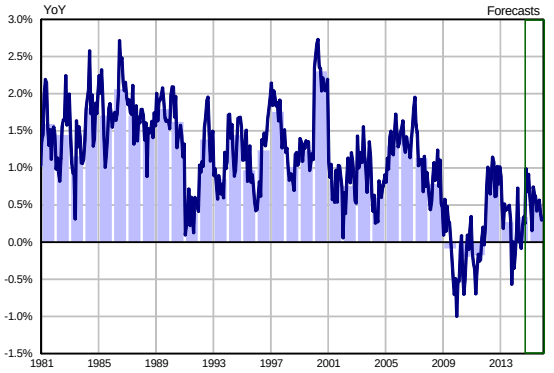
Standing at 5.9% in September 2014, the unemployment rate is still close to its highs in 2003, during the previous business cycle, and this fact alone calls for accommodative monetary policy. Even if withdrawals from the labour force turn out to be final, the United States shows a persistently large labour market slack. Many more new jobs will be needed to bring the unemployment rate back down to its long-term level.

If the largely structural nature of the decline in the labour force participation rate continues, monetary policy will not be right tool for dealing with persistent problems on the labour market. Measures to help the unemployed find jobs would be more suitable for boosting labour force participation.

4.4 A continuing decline in the labour force participation rate would also undermine potential growth in the United States

The prospect of a continuing decline in the participation rate in the United States, combined with slower population growth of 0.9% per year, would have a major impact on the growth of US labour force, slowing it to less than 0.5% per year, as opposed to 1.1% growth per year on average between 1990 and 2008 (see Chart 9).

Chart 9: Labour force growth should remain far below its pre-crisis levels



Source: BLS - Household Survey, DG Trésor calculations.

The structural decline in labour force growth would affect potential growth. The aging US population and the decline in the labour force participation rate would then contribute to a lasting decrease in growth in the United States.

Guillaume CLÉAUD, Louis de CHARSONVILLE

(9) This finding represents the residual differential between the participation rate and the structural participation rate (see Chart 4).

(10) According to the BLS statistics, there were some 2 million individuals who were marginally attached to the labour force in September 2014. These individuals are available for work and have actively looked for jobs in the last 12 months, but not during the last four weeks, regardless of the reasons. But this figure is only 974,000 up from the low seen in December 2006.

(11) See the article published on the New York Fed website on 3 February 2014: "A Mis-Leading Labor Market Indicator".

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