

These are findings from an Ipsos poll conducted for Thomson Reuters from March 1-5, 2013. For the survey, a sample of 1,797 Americans ages 18+ were interviewed online, including 726 Democrats, 650 Republicans, and 241 Independents. The precision of the Reuters/Ipsos online polls is measured using a [credibility interval](#). In this case, the poll has a credibility interval of plus or minus 2.6 percentage points for all, 4.1 percentage points for Democrats, 4.5 percentage points for Republicans, and 7.2 percentage points for Independents. For more information about credibility intervals, please see the appendix.

The data were weighted to the U.S. current population data by gender, age, education, and ethnicity. Statistical margins of error are not applicable to online polls. All sample surveys and polls may be subject to other sources of error, including, but not limited to coverage error and measurement error. Figures marked by an asterisk (\*) indicate a percentage value of greater than zero but less than one half of one per cent. Where figures do not sum to 100, this is due to the effects of rounding.

### BUDGET CUTS ('SEQUESTER')

Q1. Who do you think is more responsible for the following?

	<u>Democrats in Congress</u>	<u>Republicans in Congress</u>	<u>President Obama</u>	<u>All of the above</u>	<u>Other</u>	<u>Unsure</u>
Causing the most recent economic recession	8%	29%	15%	31%	4%	11%
The current economic climate in [your state]	10%	21%	11%	25%	12%	22%
The current national unemployment rate	10%	23%	17%	31%	5%	14%
The current situation with the budget cuts ('sequester')	8%	24%	19%	32%	1%	16%

Q2. How much, if anything, do you know about the multi-billion dollar package of cuts to domestic and defense spending that go into effect on March 1st, which is also referred to as the 'sequester'?

	<u>All respondents</u>	<u>Democrats</u>	<u>Republicans</u>	<u>Independents</u>
A great deal	9%	7%	15%	8%
A fair amount	27%	31%	31%	26%
A little bit	35%	38%	34%	40%
Nothing at all	28%	24%	20%	26%

Q3. The scheduled budget cuts ('sequester') will cut at least \$85 billion from many federal agencies between March 1<sup>st</sup> and September 30<sup>th</sup> unless a deal can be reached. This includes cutting \$55 billion from defense spending and \$27 billion in discretionary domestic spending such as Medicare, food safety inspectors, and border agents.

If Congress and President cannot make a deal to stop the budget cuts, which of the following solutions comes closest to your opinion?

	<u>All respondents</u>	<u>Democrats</u>	<u>Republicans</u>	<u>Independents</u>
Allow cuts to go into effect March 1st	35%	28%	52%	28%
Delay the cuts until Congress and the President can reach a deal	44%	57%	36%	34%
Unsure	20%	14%	12%	28%

Q4. Who would you say most deserves blame for a deal on these budget cuts ('sequester') not being reached?

	<u>All Respondents</u>	<u>Democrats</u>	<u>Republicans</u>	<u>Independents</u>
Democrats in Congress	6%	3%	14%	4%
Republicans in Congress	27%	54%	4%	18%
President Obama	17%	3%	39%	15%
All of the above	38%	34%	37%	49%
Other	1%	1%	2%	*
Unsure	10%	5%	4%	14%

## How to Calculate Bayesian Credibility Intervals

The calculation of credibility intervals assumes that  $Y$  has a binomial distribution conditioned on the parameter  $\theta$ , i.e.,  $Y|\theta \sim \text{Bin}(n, \theta)$ , where  $n$  is the size of our sample. In this setting,  $Y$  counts the number of “yes”, or “1”, observed in the sample, so that the sample mean ( $\bar{y}$ ) is a natural estimate of the true population proportion  $\theta$ . This model is often called the likelihood function, and it is a standard concept in both the Bayesian and the Classical framework. The Bayesian <sup>1</sup> statistics combines both the prior distribution and the likelihood function to create a posterior distribution. The posterior distribution represents our opinion about which are the plausible values for  $\theta$  adjusted after observing the sample data. In reality, the posterior distribution is one’s knowledge base updated using the latest survey information. For the prior and likelihood functions specified here, the posterior distribution is also a beta distribution ( $\pi(\theta|y) \sim \beta(y+a, n-y+b)$ ), but with updated hyper-parameters.

Our credibility interval for  $\vartheta$  is based on this posterior distribution. As mentioned above, these intervals represent our belief about which are the most plausible values for  $\vartheta$  given our updated knowledge base. There are different ways to calculate these intervals based on . Since we want only one measure of precision for all variables in the survey, analogous to what is done within the Classical framework, we will compute the largest possible credibility interval for any observed sample. The worst case occurs when we assume that  $a=1$  and  $b=1$  and . Using a simple approximation of the posterior by the normal distribution, the 95% credibility interval is given by, approximately:

$$\bar{y} \pm \frac{1}{\sqrt{n}}$$

For this poll, the Bayesian Credibility Interval was adjusted using standard weighting design effect  $1+L=1.3$  to account for complex weighting<sup>2</sup>

Examples of credibility intervals for different base sizes are below. Ipsos does not publish data for base sizes (sample sizes) below 100.

Sample size	Credibility intervals
2,000	2.5
1,500	2.9
1,000	3.5
750	4.1
500	5.0
350	6.0
200	7.9
100	11.2

<sup>1</sup> *Bayesian Data Analysis, Second Edition, Andrew Gelman, John B. Carlin, Hal S. Stern, Donald B. Rubin, Chapman & Hall/CRC | ISBN: 158488388X | 2003*

<sup>2</sup> *Kish, L. (1992). Weighting for unequal Pi. Journal of Official, Statistics, 8, 2, 183200.*