NEW YORK, Feb 3 (Reuters) - U.S. stocks gained on Tuesday, as the benchmark S&P 500 index extended a late rally from the prior session, fueled by hopes of a deal on Greek debt and by rising oil prices.

Stocks had rallied late Monday on signs Greece was softening its approach to debt negotiations. A source told Reuters that Greek Finance Minister Yanis Varoufakis, in London to reassure private investors he was not seeking a showdown with Brussels over a new debt agreement, said the new left-wing government would spare privately held bonds from losses.

However, the Greek proposal to swap government debt for bonds with interest payments linked to economic growth got a cool reception from euro zone officials on Tuesday.

Adding support to U.S. equities was a further gain in oil prices, with U.S. crude up 2.9 percent to $50.99 and Brent up 2.6 percent to $56.16. Shares of offshore contract driller Transocean gained 5 percent to $18.17.

The S&P 500 is up nearly 2 percent over the past two sessions after suffering its biggest monthly drop in a year in January, when a drop in oil prices, softening economic data and worries about Greece pulled equities lower. Stocks have also seen increasing intraday swings of late.

"Right now we are certainly in a bipolar market, it depends on the day," said Joe Saluzzi, co-manager of trading at Themis Trading in Chatham, New Jersey. "Bottom line, the market picks something to trade on and right now it is certainly Europe and it is certainly oil."

The Dow Jones industrial average rose 144.59 points, or 0.83 percent, to 17,505.63, the S&P 500 gained 10.06 points, or 0.5 percent, to 2,030.91 and the Nasdaq Composite added 3.44 points, or 0.07 percent, to 4,680.13.

Stratasys shares plunged 30.9 percent to $55.35 after the 3D printer maker cut its 2014 adjusted profit estimates for a second time.
Office Depot shares surged 18.3 percent to $9.03 after the Wall Street Journal reported the company was in advanced talks to merge with Staples Inc. Staples shares jumped 9 percent to $18.69.

U.S. factory orders fell for a fifth straight month in December, by a worse-than-expected 3.4 percent, but a smaller-than-previousy reported drop in business spending plans supported views of a rebound in the months ahead.

January car sales by the three Detroit automakers topped expectations, buoyed by low gas prices and easy credit. Ford Motor gained 2.5 percent to $15.656, General Motors rose 3 percent to $34.10 and Fiat Chrysler climbed 2 percent to $13.77.

Advancing issues outnumbered declining ones on the NYSE by 2,258 to 748, for a 3.02-to-1 ratio; on the Nasdaq, 1,764 issues rose and 885 fell, for a 1.99-to-1 ratio favoring advancers.

The S&P 500 was posting 16 new 52-week highs and no new lows; the Nasdaq Composite was recording 49 new highs and 24 new lows. (Editing by Bernadette Baum and Nick Zieminski)