



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Thomas E. Swayze	Project Number J1612
Project Title Buy Bonds: Investment Algorithm Using an Inverted Linear Yield Curve	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Bonds are typically overlooked by investors, but I believe bonds can be a useful investment. Perhaps the bond market could predict economic conditions. To find out, I asked the following question: "If the yield curve of United States Treasury bonds is transformed to become linear, will certain parameters of this line predict future economic conditions such as interest rates, the stock market, and the Gross Domestic Product? If so, can an investment algorithm be developed to maximize profit?" I hypothesized that some predictions could be made, and that I could develop an investment algorithm using this information that might make significantly more money than investing only in stocks.</p> <p>Methods/Materials I found a model of the yield curve through research that transformed the yield curve into a line. I applied this model to every yield curve since 1953. I then examined the graphs of the slope and y-intercept. I plotted them against the graphs of the 30 Year Fixed Rate Mortgage, common stock indexes, and the Gross Domestic Product.</p> <p>Results I found that the graphs of the y-intercept and the 30 Year FRM almost coincided, but no prediction could be made, since movement was simultaneous. There was no obvious correlation between the stock indices and the parameters of the adjusted yield curve. However, every time the yield curve inverted, the percent change in GDP dipped below zero. This meant the inverted yield curves predicted recessions.</p> <p>Conclusions/Discussion Using this information, I created an investment algorithm. The investor buys stock, but when the yield curve inverts, he sells the stock and buys a one year bond. He only reinvests in the stock market once the yield curve returns to the median amount. I applied this method over time and found this strategy was five times as profitable as buying and holding stocks.</p>	
Summary Statement The purpose of this project was to correlate economic parameters with the yield curve transformed into a line, and develop a profitable investment strategy based upon the findings.	
Help Received Thanks to my parents for motivating me to continue and complete my work. Thanks to my science teacher for helping to edit my report.	