The obesity problem has been an increasingly serious problem world-widely. According to the investigation by the World Health Organization (WHO) in 2016, approximately 13% (650 million) of those aged 18 years and older were obese, which has nearly tripled between 1975 and 2016. between 1975 and 2016. Under the current obesity situation, countries or areas with obesity problem have been conducting related regulations or even laws aiming at the mitigation of the global poser. This study analyses the effect of sugar tax policy, one of the acts that are against the excessive sugar intake in order to prevent obesity and risks of diseases such as diabetes, osteoporosis, and depression, caused by obesity. The study conducted the analysis based on the county level annually aggreated data in the U.S.. Since the U.S. does not have a nation-wide sweetened beverage tax policy and the number of treatment groups are too small, we employed the synthetic control method and took three city-county consolidated areas as our research objects. We found that among three research objects, Philadelphia and Boulder are applicable to the synthetic control method and both taxation policy were found effective after the implementation, which had caused an average of 1.526% and 1.433% of reduction of obesity respectively.