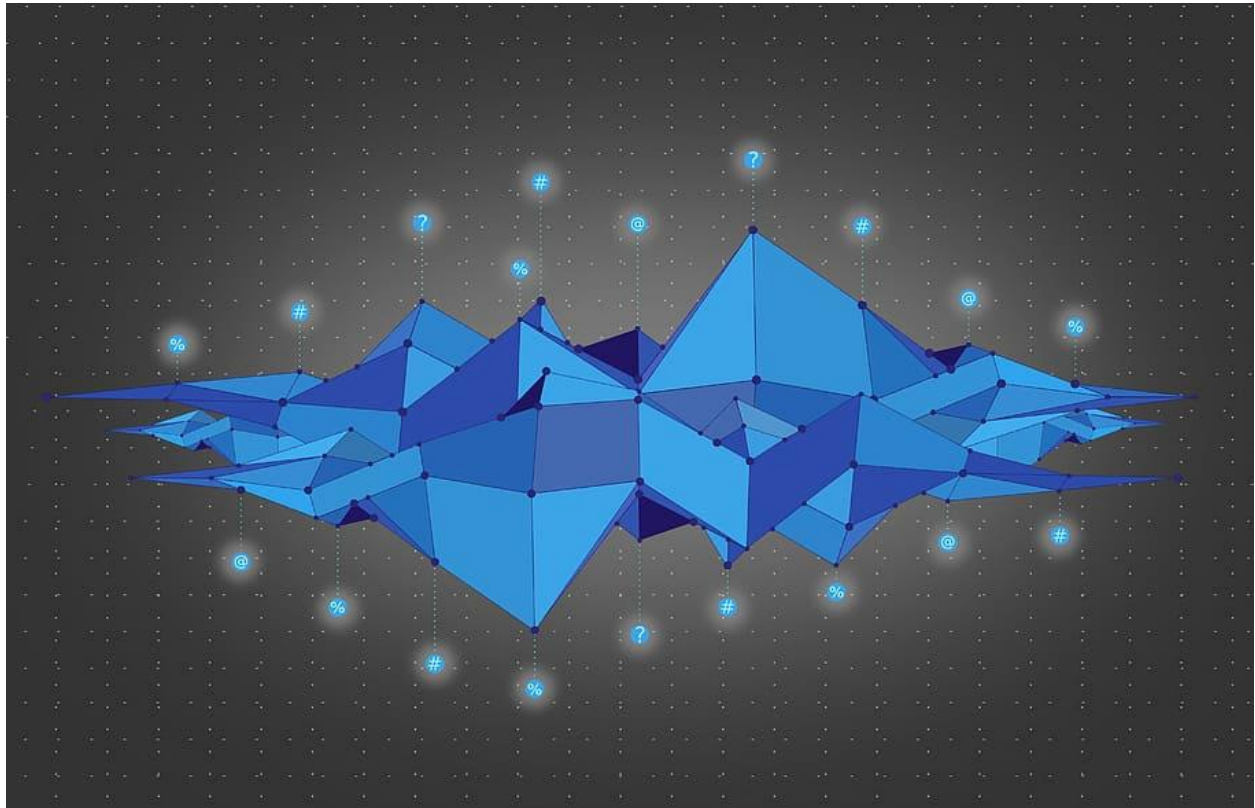


Data Analytics Notebooks – Fall 2022 & Spring 2023



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June 2023

Volume: 1

Colorado Mountain College

Purpose of the Notebooks

The purpose of these Data Analytics Notebooks is to publish the final projects of the students of Data Analytics at Colorado Mountain College (CMC) and contribute to continuing with the implementation of High Impact Practices in CMC. These Notebooks are intended to be an annual publication to inform the community about cutting-edge economic, social, and business issues in the mountain communities, the State of Colorado, the United States, and the rest of the world.

In this first issue of the Data Analytics Notebooks, the students prepared technical projects using the tools they learned in Data Analytics for Managers and Business Statistics. Dr. Rafael Perez Pena, professor of the class and editor of these Notebooks, suggested the general topics to students and edited this document. The students applied the suggested topics to their own interests.

The topics included in this volume range from an analysis of the housing market in mountain communities from different angles, the GDP-debt ratio of Asian economies, to fertility rates in the U.S.

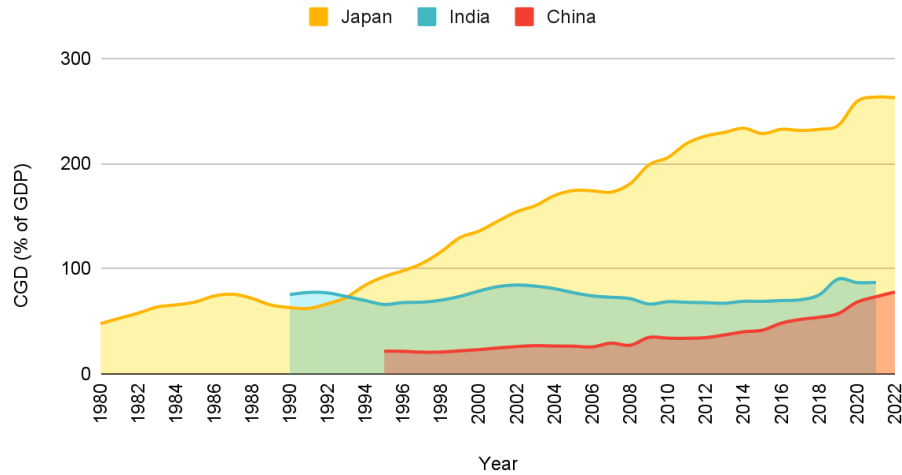
While Dr. Perez Pena provided the students with feedback on their work and supported them with the tools they applied in these projects, they are the sole authors of their projects. The information published in these notebooks are analysis conducted by the authors and does not represent the opinions of Colorado Mountain College. Editor's email: rpperez@coloradomtn.edu

Identifying the Correlation between GDP & CGD

Author: Keith Karleen

Basing fiscal policy on Keynesian economics could be harmful to the economy. John Maynard Keynes's fiscal opinion developed during the turmoil of the great depression. Extreme economic paradigms, like the great depression, occur once every century, if that. Global markets exhibited extreme irrationality and government stimulus was necessary to keep the domestic industry afloat.

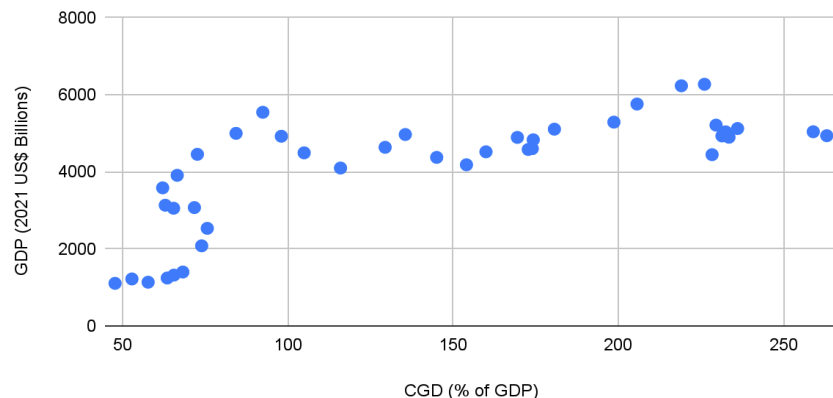
Central Government Debt (1980-2022)



A key piece of Keynes' philosophy, even during extreme economic irrationality, was fiscal policy should recede as private investment rises. Unfortunately, modern economies have turned this key piece into a forgotten footnote. Studies suggest when Central Government Debt (CGD) exceeds 77% of Real Gross Domestic Product (GDP) a measurable drag on growth is observable. Japan's CGD skyrocketed in the 90s as observed in graph 1 when their currency and stock index crashed. Liberal fiscal spending tried to change the course of markets but proved to be insufficient. Japan has not sufficiently constrained its spending in the following decades and created a measurable drag on its GDP as observed in graph 2. China and India are following in their footsteps.

The pandemic was a global economic shock that should dictate fiscal policy. Nations should spend more to protect their solvency. Whether they can curtail their CGD after the pandemic to prevent stagnation is the question. As Keynes himself said: "When my information changes, I alter my conclusions. What do you do, sir?"

Japan Real Gross Domestic Product vs Central Government Debt (1980-2021)



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STR (Short-Term Rental) and LTR (Long-Term Rental) for Pitkin County, Colorado

Author: David Avila

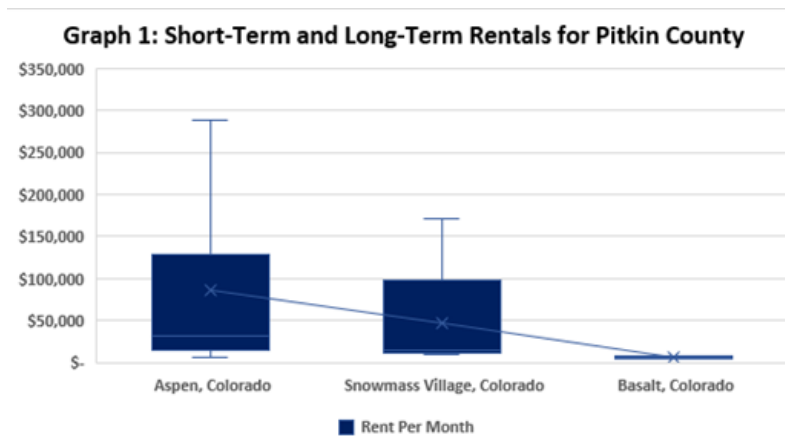
The purpose of this research project is to identify the cost that short and long-term renters (STR and LTR) pay per month to stay in Pitkin County. The information provided by the Airbnb website calculates the cost of approximately three months for STR and one year for LTR. This research specifically covers three regions: Aspen, Snowmass Village, and Basalt. These are geographical areas with a range of STR and LTR data, where rents generate between \$5,000 to \$500,000 per month. Included are two cross-sectional graphs to represent the rental costs in Pitkin County.

This research is relevant to inform tourists of their pricing options to meet their budgets for STR and LTR stays. The findings reveal that Aspen is the most expensive town for rentals in Colorado. These graphs represent the definition of cross-sectional data showing different individuals at the same point in time. The goal of analyzing this data is to highlight the disparity in rental prices within a localized region. All three towns are in close proximity to one another. The exorbitant price differential in Aspen vs Basalt does not allow equal access for tourists of varying economic needs.

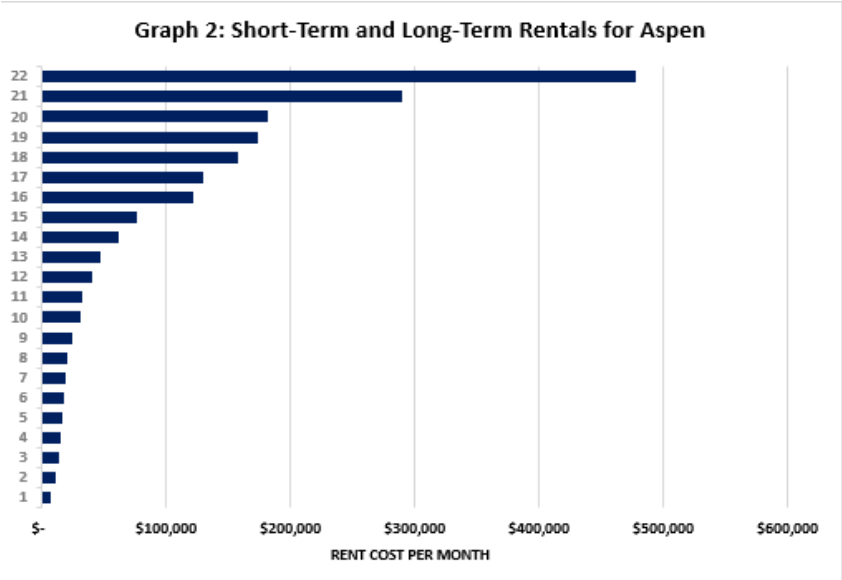
The main goal of this project is to show the results of the Airbnb website to inform renters of costs, the STR environment for neighborhoods, and the dispersion among middle-class and wealthy towns. According to *Hashtag Colorado Life* regarding rents in the geographical area studied, “[rents are] insanely-high priced when compared to the median home price in the entire state which is \$589,000” (Nicolson, 2022). Aspen is the highest cost for affordable housing.

This report uses a raw Microsoft Excel spreadsheet provided by two charts and utilizes these graphs visually.

Graph 1: This report uses side-by-side box plots for each valley to illustrate the amount of rent per month. Aspen has the highest cost of \$300,000, and Basalt has the lowest cost of \$50,000. Snowmass Village has the highest cost, nearly \$200,000.



Graph 2: This graph utilizes a vertical chart to identify Aspen. The independent variable is the rent per month, and the dependent variable is Aspen in 22 out of 30 observations. The highest cost for Aspen is nearly \$500,000, and the lowest is at least \$100,000.



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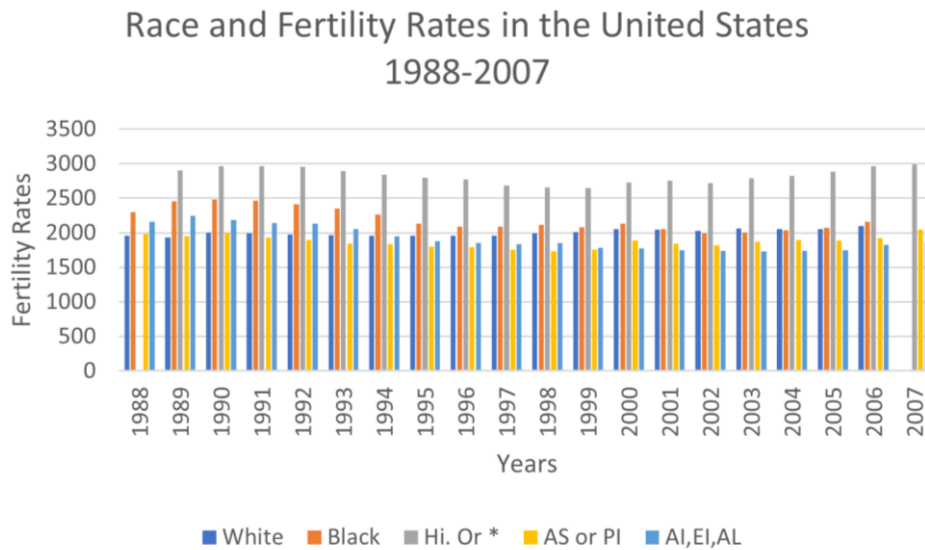
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Fertility Rate by Race and Hispanic Origin in the United States from 1988-2007

Author: Nysha N. Slager

This research project applies to those who are interested in gaining insight on whether there is a correlation between fertility rate and race or Hispanic Origin, in the United States. This can be utilized to understand future population demographic changes. Such as growth or shrinkage, stabilization, or understanding of demographic shifts. Within this document, we can see a visualization and a concise explanation of this data to better understand these trends for the years 1988-2007.

Chart One is a histogram, plotting the data between fertility rates and race or Hispanic Origin. This graphs data set supports the concept that Hispanic Origin is leading in fertility for the United States for the span of years 1988-2007. Following behind is Black, while all other races are closely intertwined year by year.



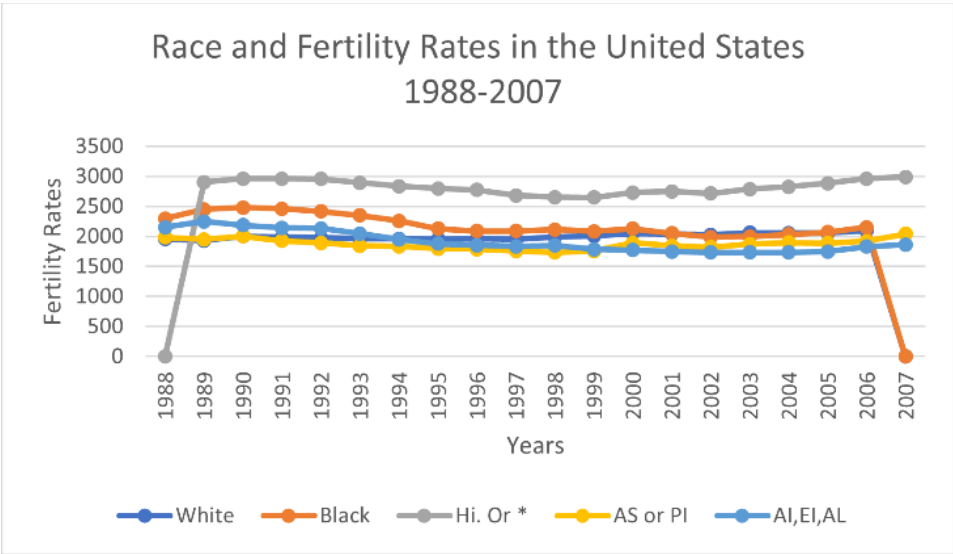
Graph Race Categories:

- Hi. Or*: Hispanic Origin
- AS or PI: Asian or Pacific Islander
- AI, EI, AL: American Indian, Eskimo, Aleut

*Gestational carriers of Hispanic Origin may be of any race.

Remark: Data excludes any fertility rates of nonresidents of the United States.
Data for Hi. Or 1988 and Black 2007

Chart Two is a time series data chart, this also plots the data regarding fertility rates and race or Hispanic Origin. This data chart is used to expose patterns within a set time frame. This shows us that Hispanic Origin has been leading for fertility rates while Black has followed behind except for in the years 2002 and 2003.



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