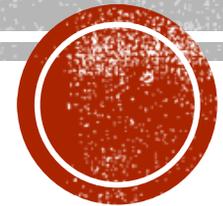


# **GDP, DEBT, AND THE HEALTH OF THE STOCK MARKET**

PY 538 Econophysics

Anthony Cardillo



# OUTLINE

- Motivation
- Definition of Terms
- Methodology
- Results
- Conclusions
- Further Considerations



# MOTIVATION

- Investigate how the values of GDP and Central Government Debt affect the national indices traded in the national market.
- Look at the sustainability of an index based on the ratio of debt to GDP of a country.
- Ultimately investigate, whether debt to GDP ratio can be used as an indicator to possible boom or bust scenarios.



# DEFINITIONS: GDP

- GDP (Gross Domestic Product) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.
- Usually is calculated on an annual basis
- Used as a broad measurement of a nation's overall economic activity, health, and standard of living.



# DEFINITION: CENTRAL GOVERNMENT DEBT

- Central government debt is the total amount owed by a government to its creditors.
- Internal debt is debt owing to national creditors
- External debt is debt owing to foreign creditors
- Central government debt plays a crucial role in a country's financial



# DEFINITION: INDEX

- An index is an indicator or statistical measure of change in a securities market.
- Indices consist of a portfolio of securities representing a particular market or portion of it.
- Each index has its own calculation methodology.

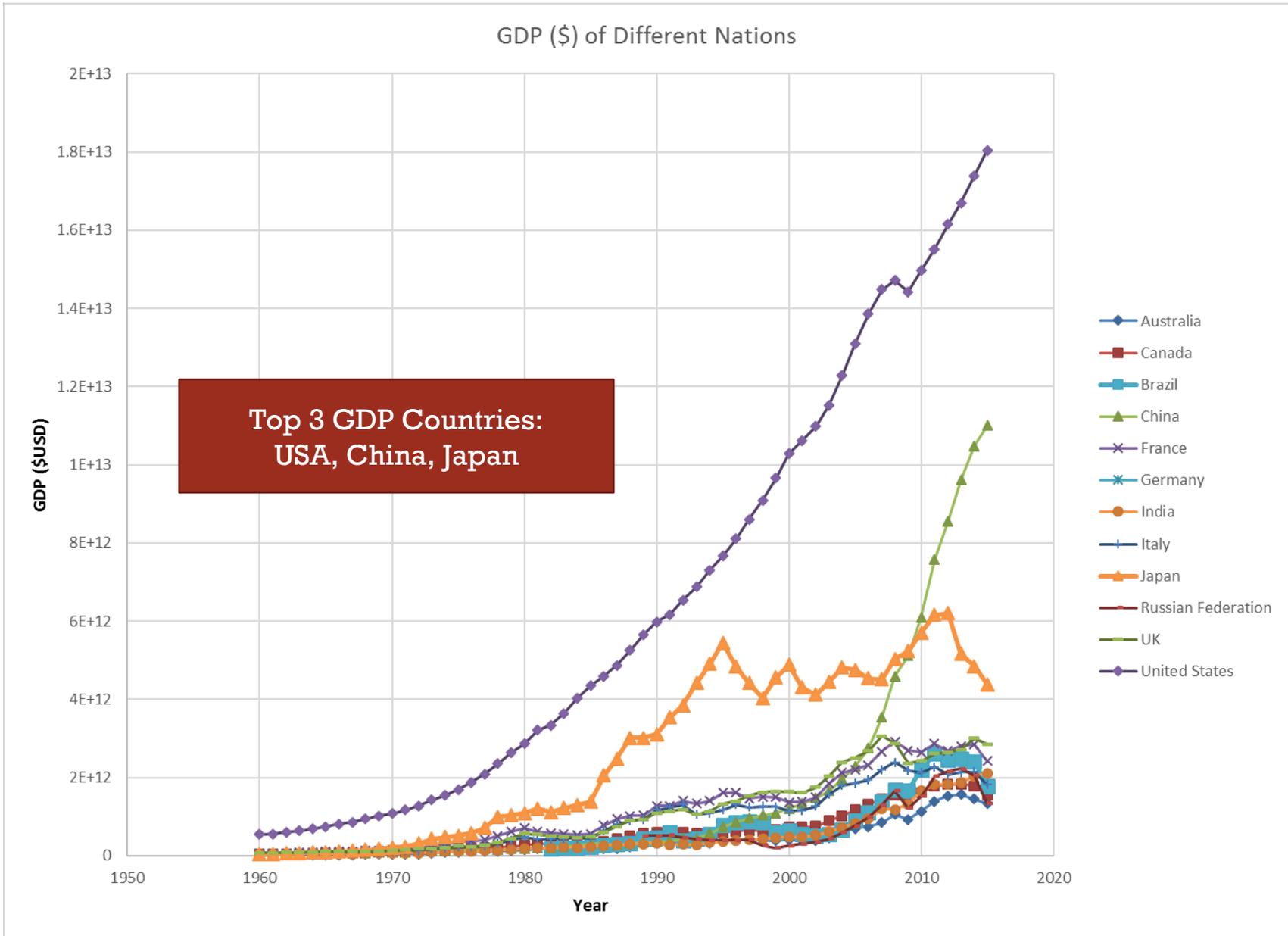


# METHODOLOGY

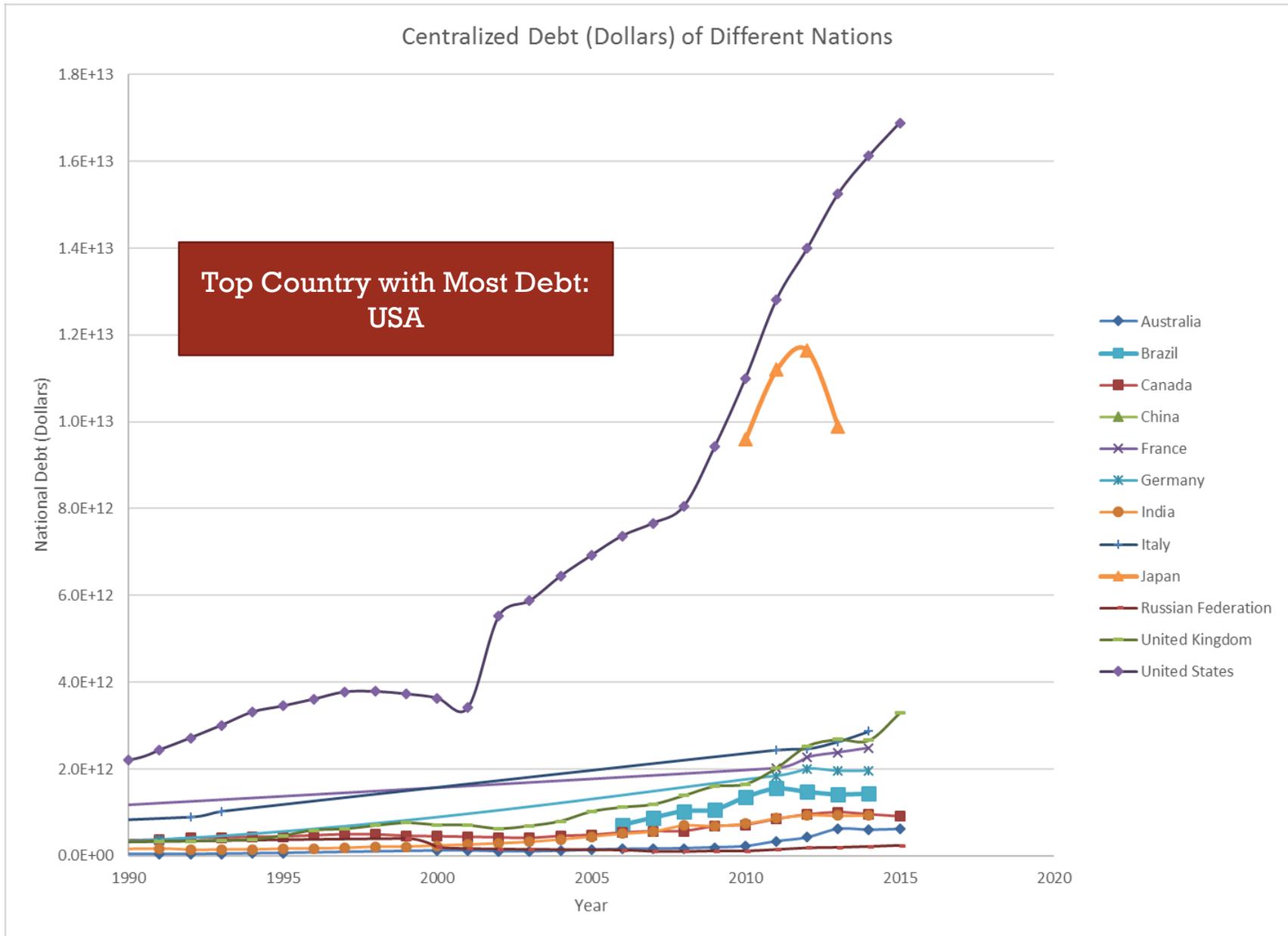
- WHO: Top Ten GDP countries + Australia and Russia
- WHAT: GDP, Central Government Debt, Major Stock Market Index for that Country
- WHEN: Data for GDP available from 1960, Debt from 1990, and varying times for indices.
- WHERE: Microsoft Excel
- WHY: To find possible relationship between Debt/GDP ratio and stock market index price.
- HOW: Data sources include:
  - The World Bank Group (GDP, Debt)
  - Yahoo Finance (Indices)



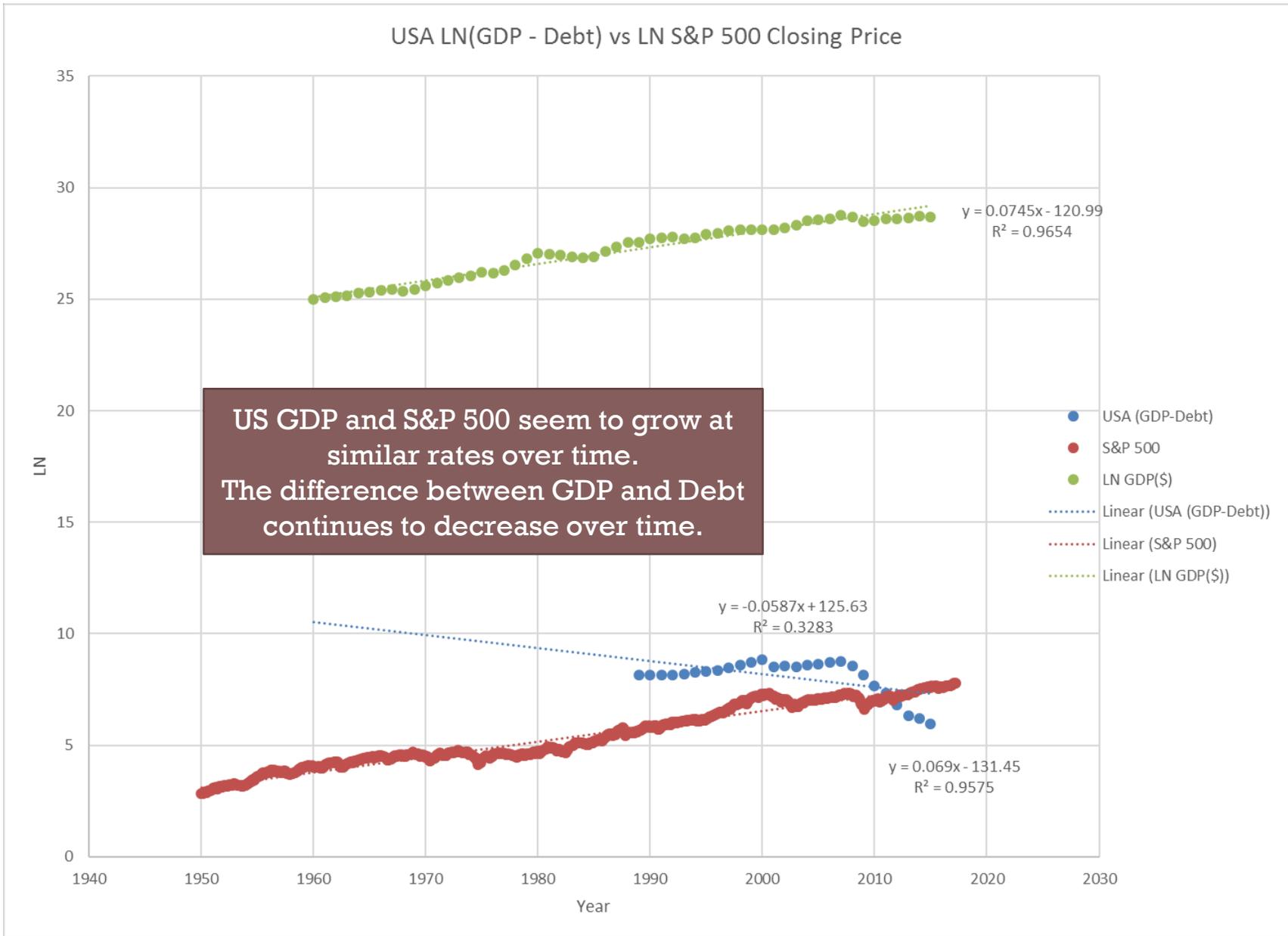
# RESULTS



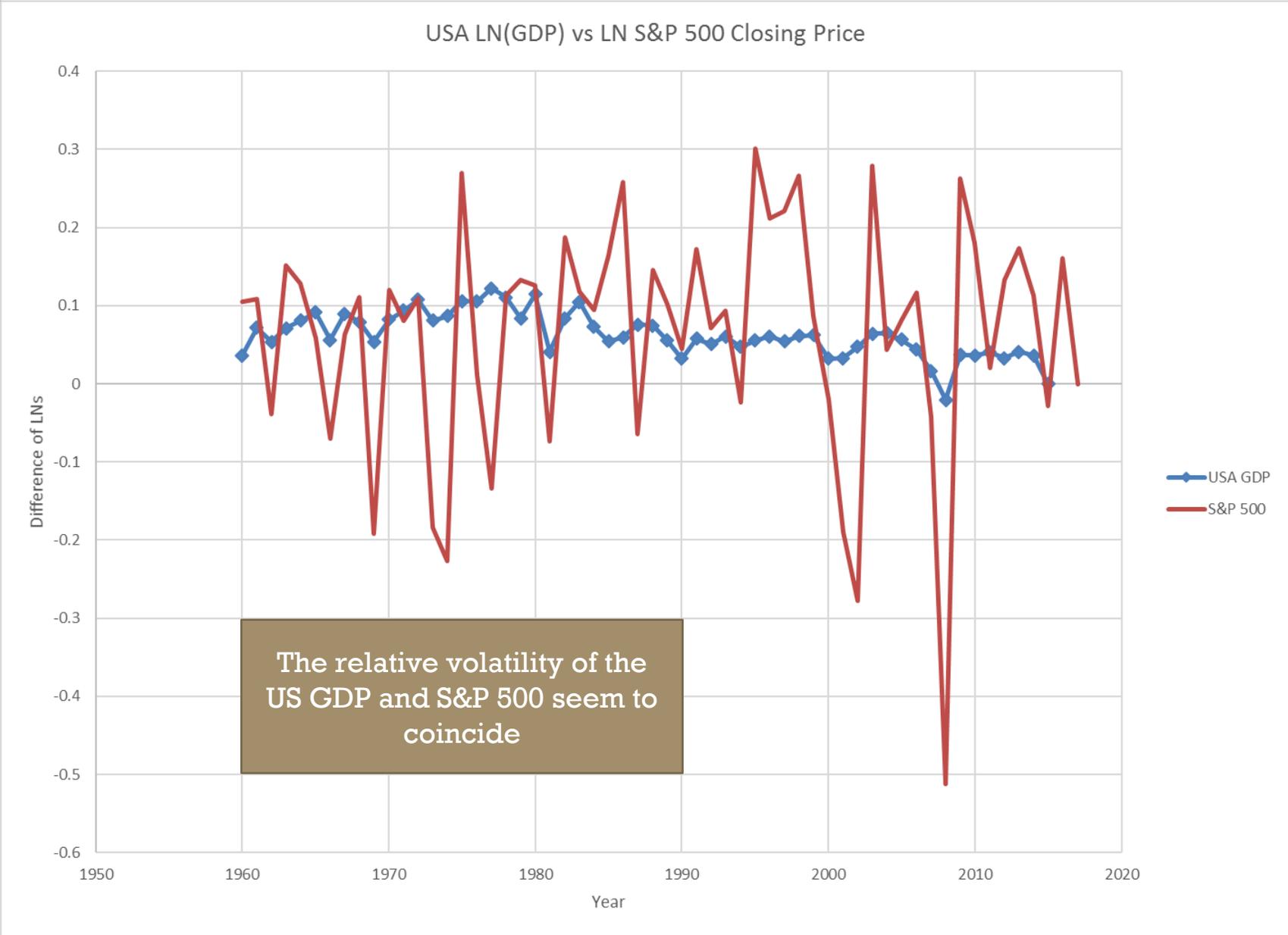
# RESULTS



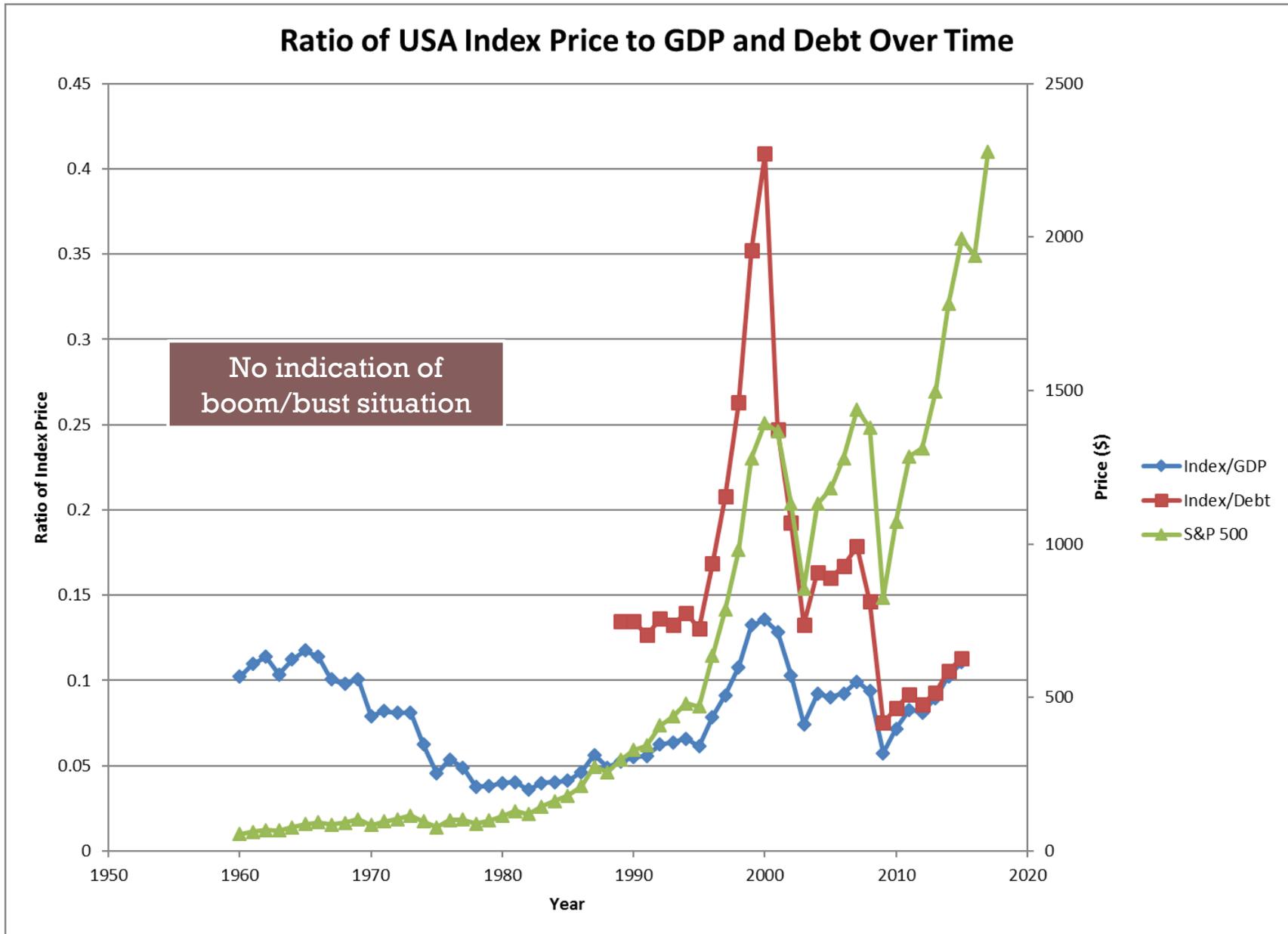
# RESULTS: US GDP VS INDEX GROWTH



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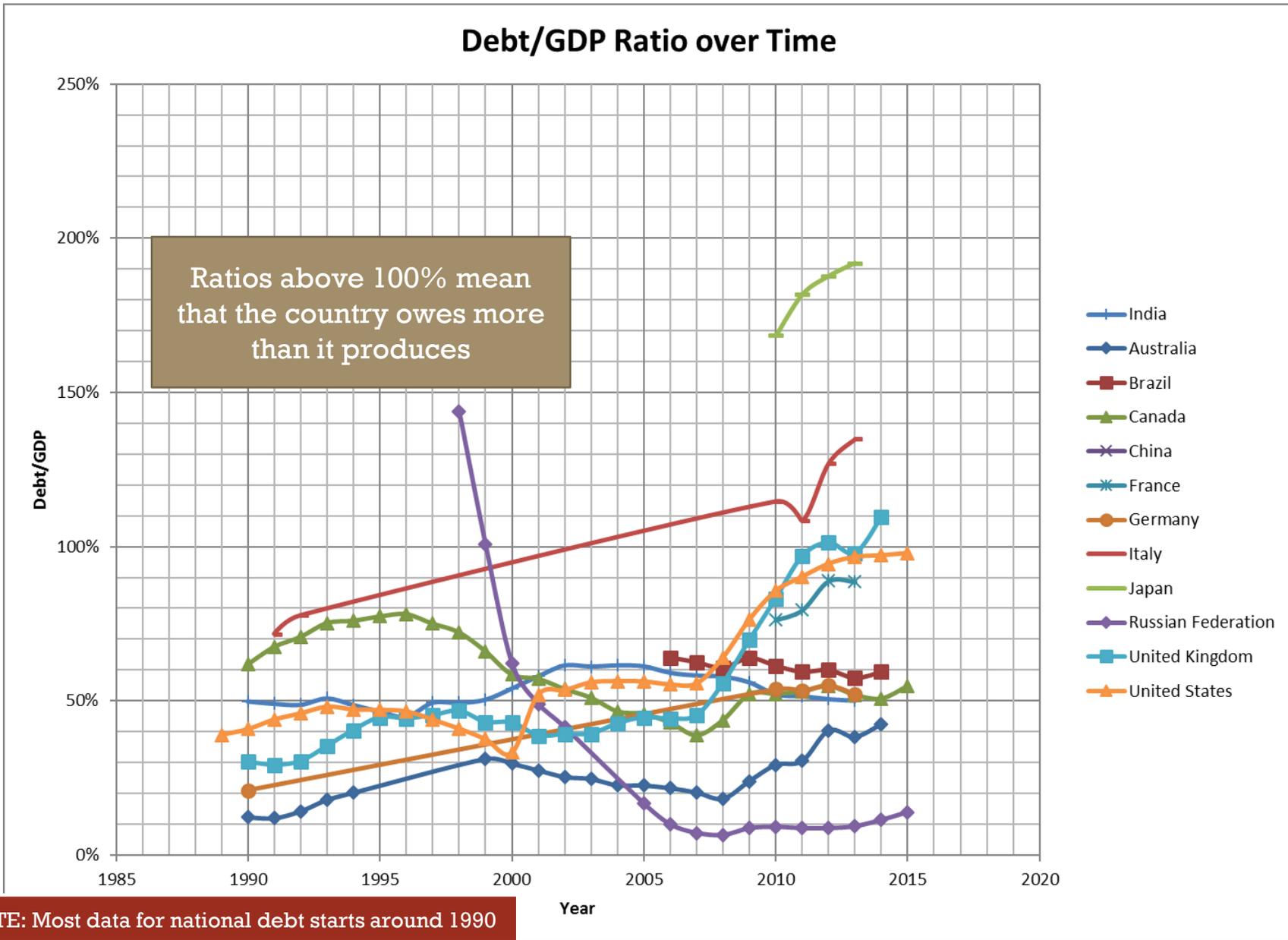


# DEFINITION: DEBT/GDP RATIO

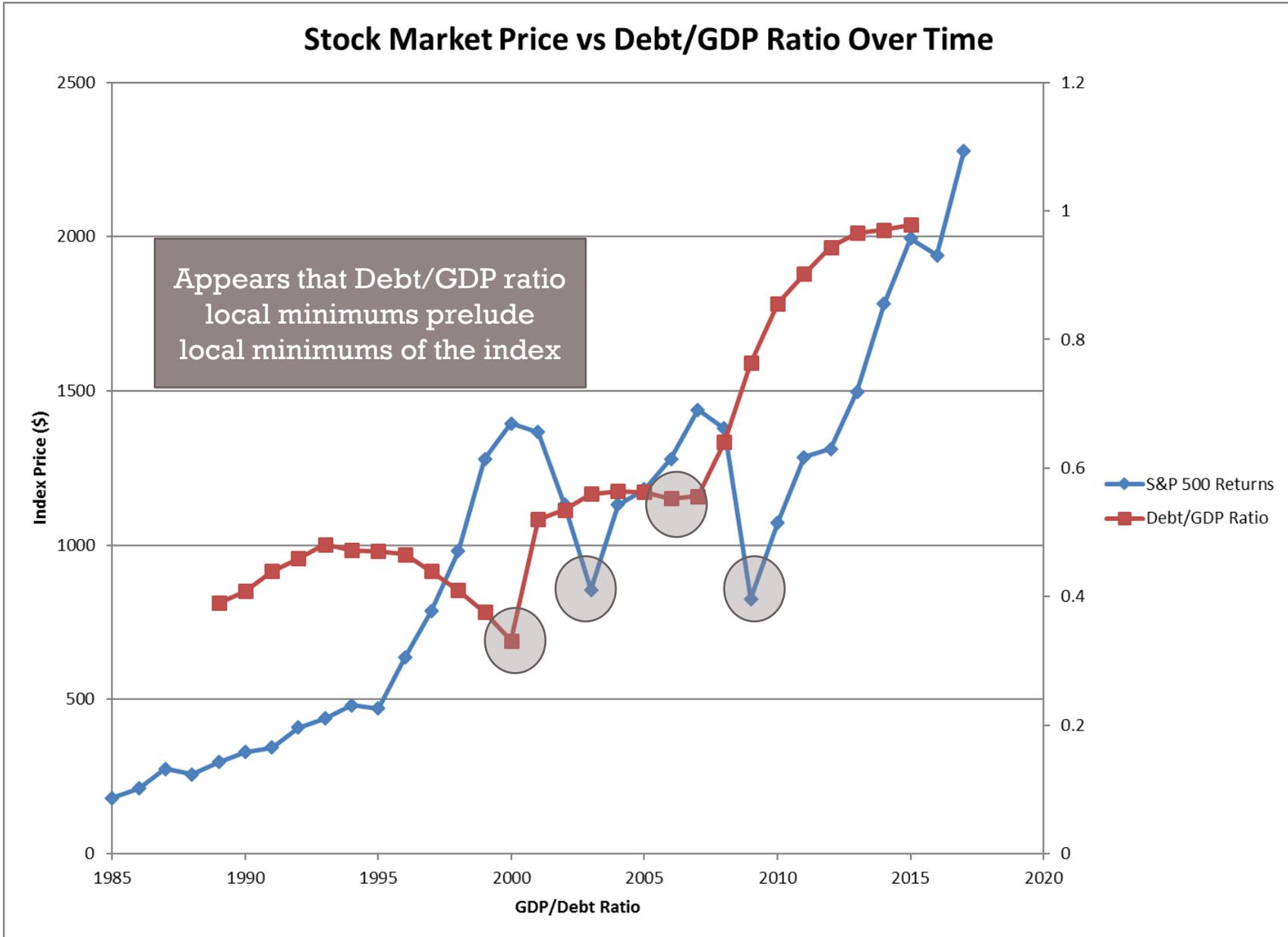
- Ratio of a country's public debt to its gross domestic product.
- Indicates the country's ability to pay back its debt.
- High debt/GDP ratio may make it more difficult for the country to pay its external debts, and may lead creditors to seek higher interest rates when lending.
- Higher ratios also tend to carry higher risks of default.



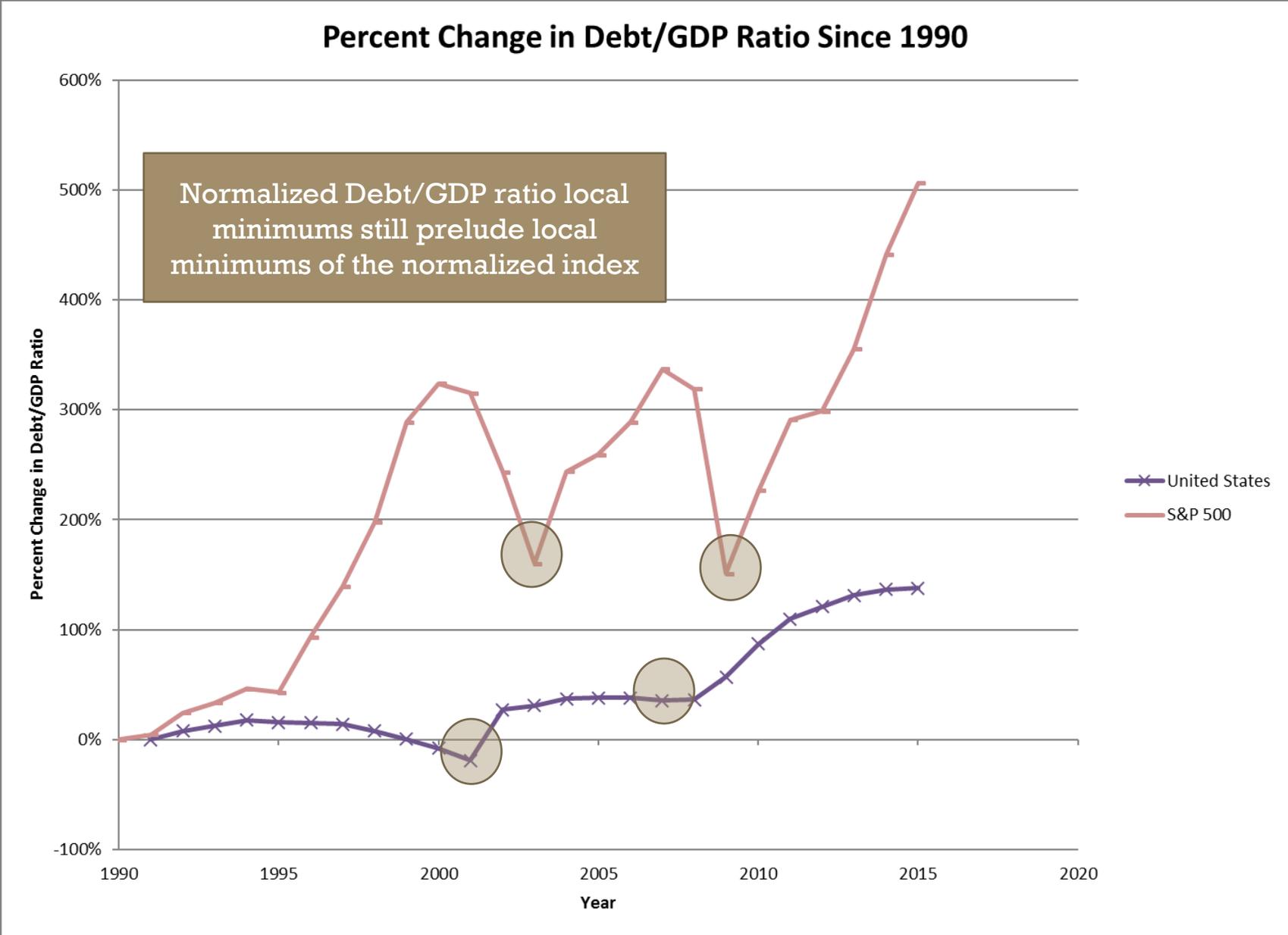
# RESULTS: DEBT/GDP RATIO



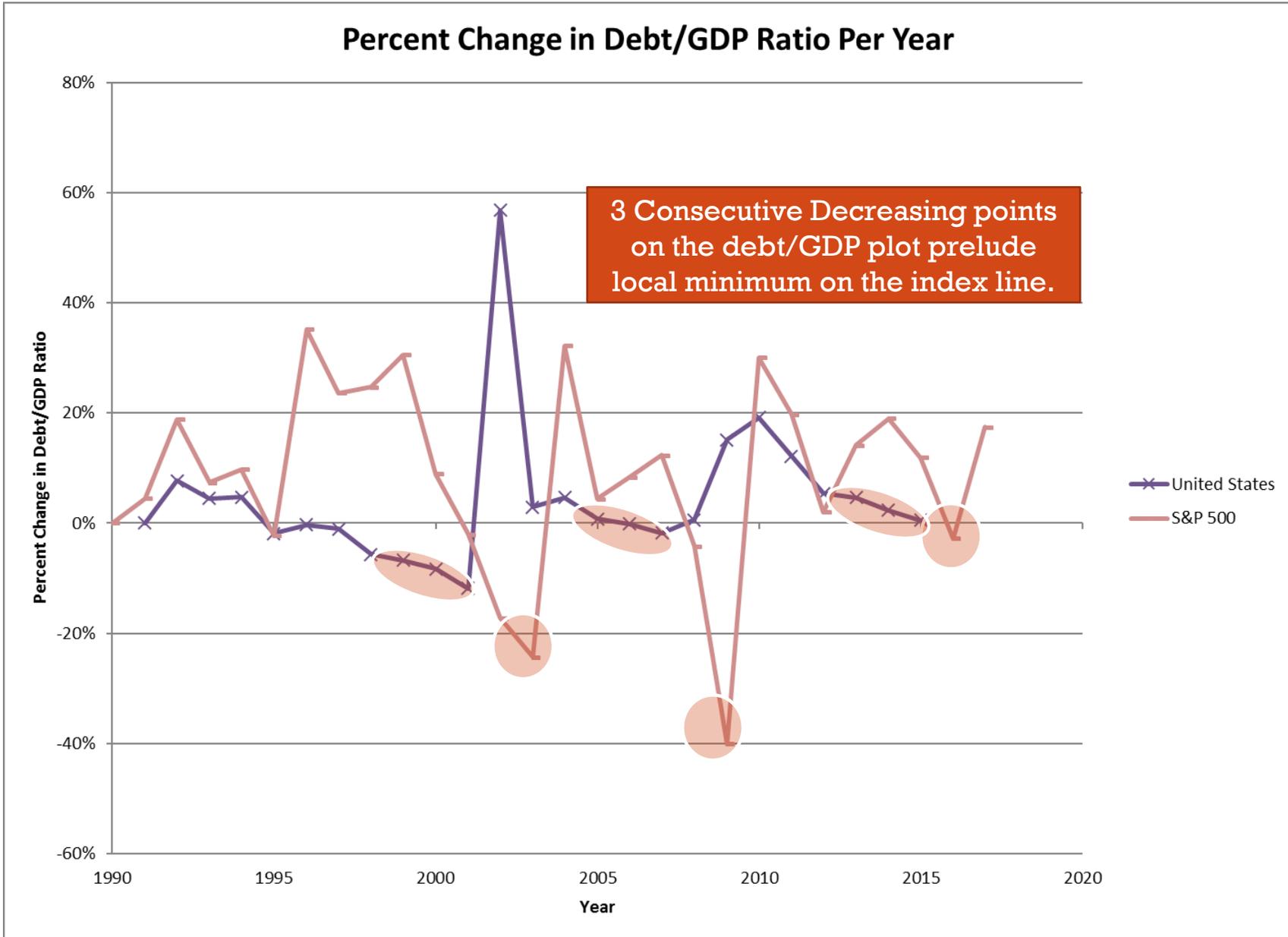
# RESULTS: DEBT/GDP RATIO



# RESULTS: DEBT/GDP RATIO NORMALIZED

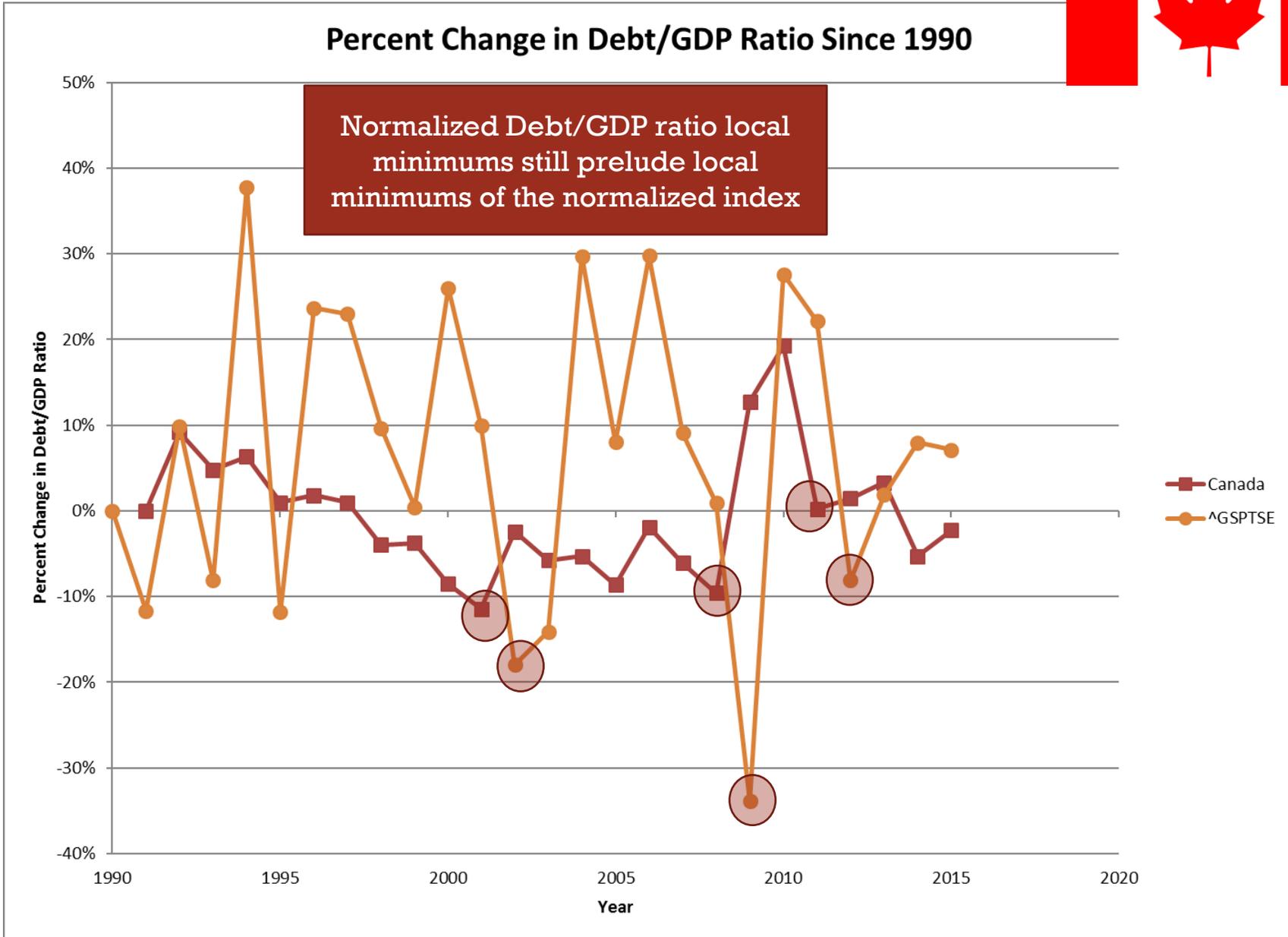


# RESULTS: DEBT/GDP RATIO NORMALIZED



# RESULTS: DEBT/GDP RATIO NORMALIZED

*NOT JUST THE UNITED STATES MARKET*

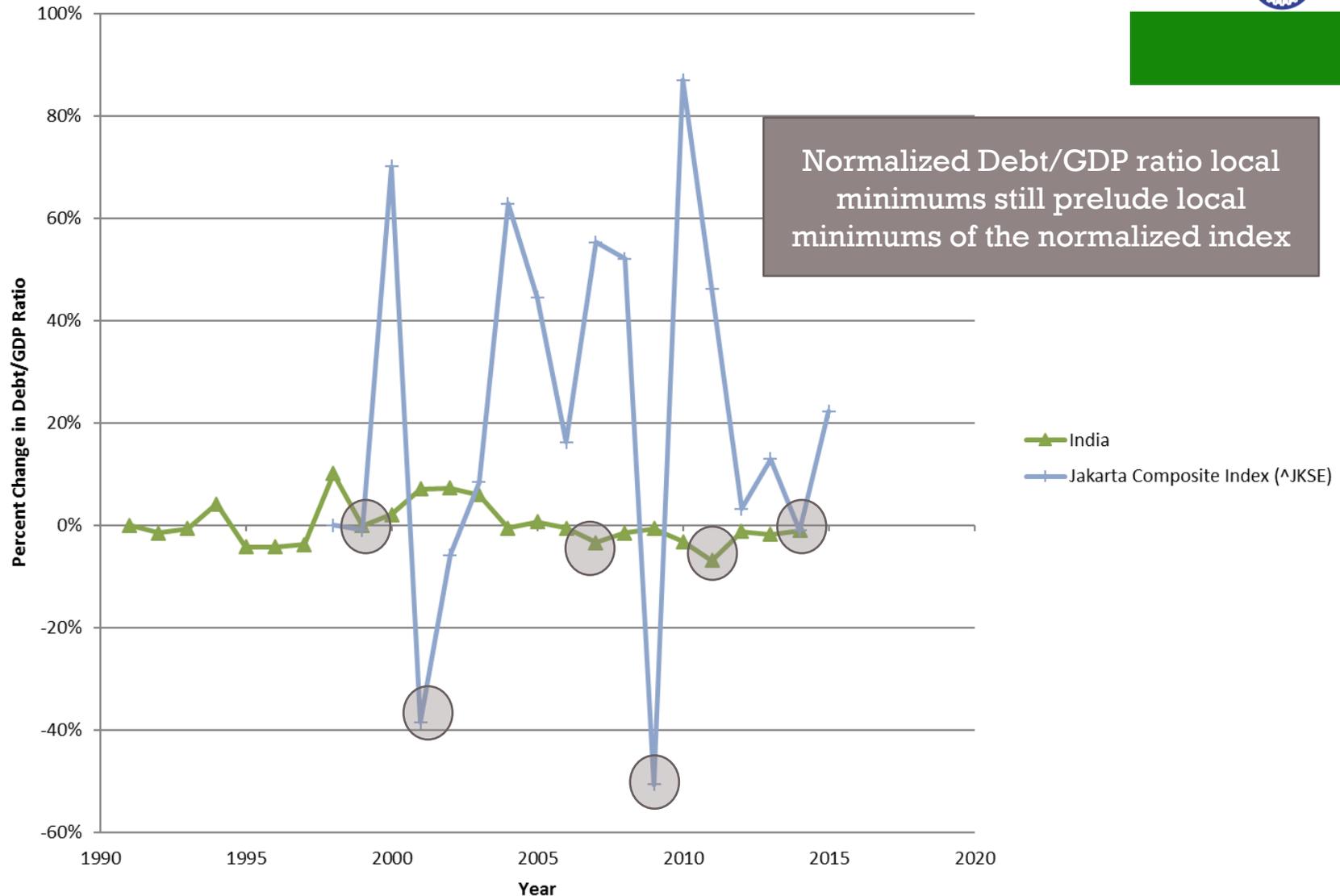


# RESULTS: DEBT/GDP RATIO NORMALIZED

*NOT JUST THE UNITED STATES MARKET*



Percent Change in Debt/GDP Ratio Since 1990



# CONCLUSIONS

- ✓ GDP and Central Government Debt are good indicators to health of a country's economy
- ✓ Sustainability of an index based on debt/GDP ratio is inconclusive
  - Further investigation to be made on sustainability of debt/GDP ratio in comparison to the index market capitalization.
- ✓ Local minimum in index prices appear to be determined preemptively by local minimum in the normalized debt/GDP ratio.



# FURTHER INVESTIGATION

## ❑ Market Capitalization to GDP Ratio

- ❑ Based off historic ratios can forecast busts.

## ❑ Other Economic factors

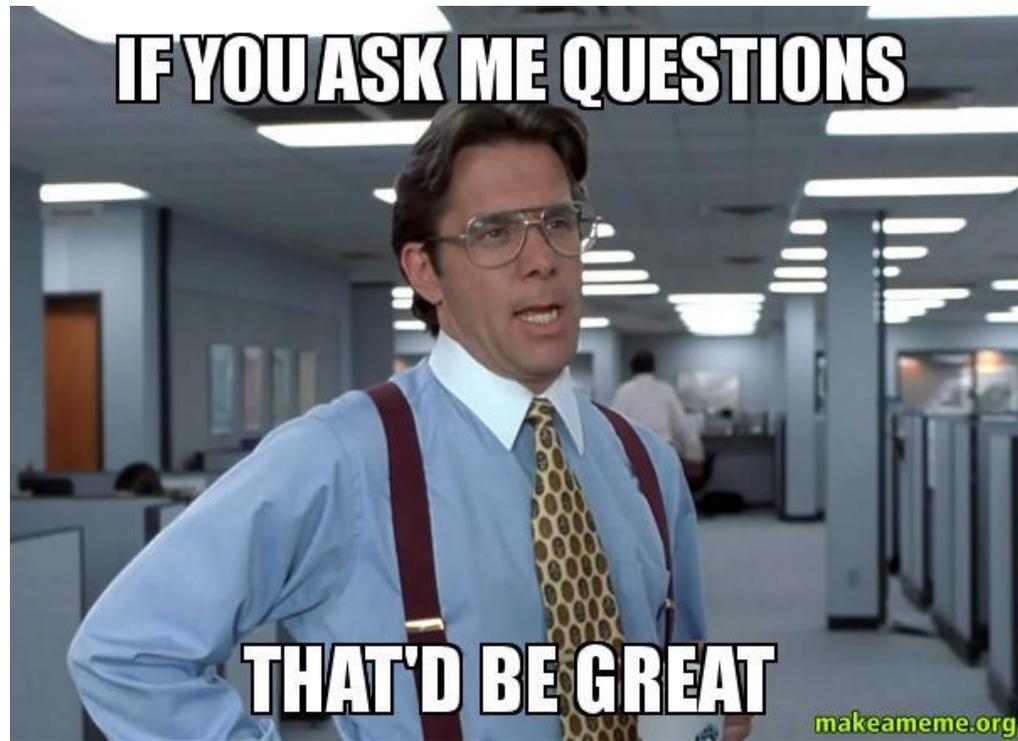
- ❑ Employment Rate, Wages, ect.

## ❑ Global interconnectedness

- ❑ How different countries economies are interconnected?



**QUESTIONS?**



# REFERENCES

<b>Slide</b>	<b>Object</b>	<b>Reference</b>
4	Definition	<a href="http://www.investopedia.com/terms/g/gdp.asp">http://www.investopedia.com/terms/g/gdp.asp</a>
4	Image	<a href="http://www.austindailyherald.com/wp-content/uploads/2014/12/81_157901.jpg">http://www.austindailyherald.com/wp-content/uploads/2014/12/81_157901.jpg</a>
5	Definition	<a href="http://study.com/academy/lesson/what-is-national-debt-definition-effects-history.html">http://study.com/academy/lesson/what-is-national-debt-definition-effects-history.html</a>
5	Image	<a href="https://s3.amazonaws.com/lowres.cartoonstock.com/-us_national_debt-u-a-u-national_debt-kfon356_low.jpg">https://s3.amazonaws.com/lowres.cartoonstock.com/-us_national_debt-u-a-u-national_debt-kfon356_low.jpg</a>
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7	Top Ten	<a href="http://data.worldbank.org/data-catalog/GDP-ranking-table">http://data.worldbank.org/data-catalog/GDP-ranking-table</a>
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7	Index Data	<a href="https://finance.yahoo.com/">https://finance.yahoo.com/</a>
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With help from: Andrea Fenu, Prof. Stanley, Xiangyi Meng

