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Japan

The relationship between real GDP
and Real Primary Exports

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Econometrics: Analysis and Forecasting
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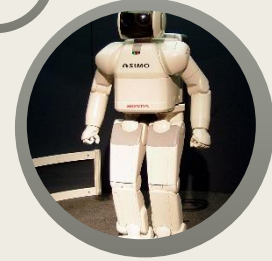


Context

- Motivation behind the country selection
- Country profile
- GDP and Export relationship
- Methodology
- Results
- Conclusion

Reason of choice

- 3rd largest economy in the world
- Japanese cultural philosophy in their economy
- Small agricultural area – High yield
- Worldwide known mastery of manufacturing
- Infrastructure investments





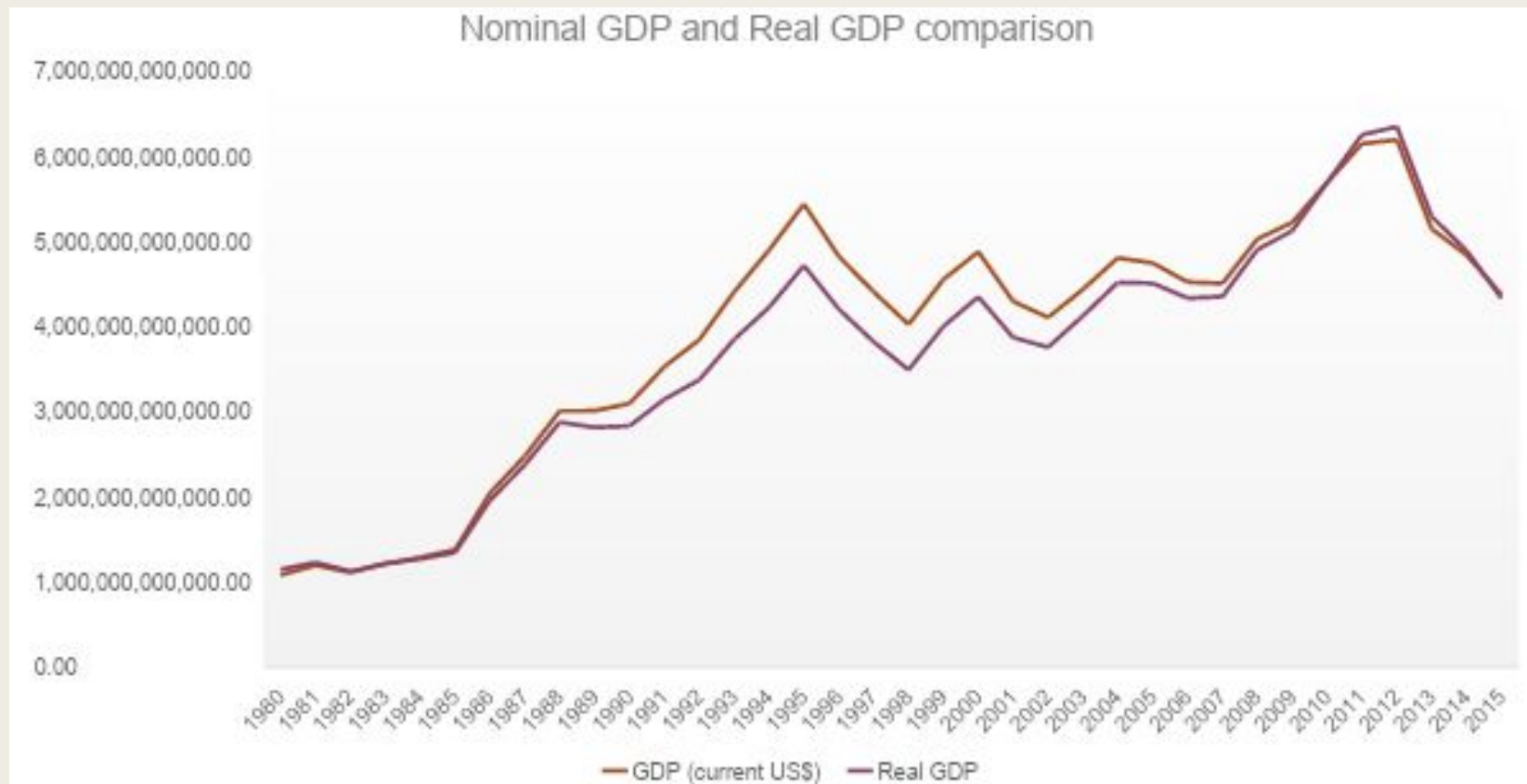
Country profile

1980

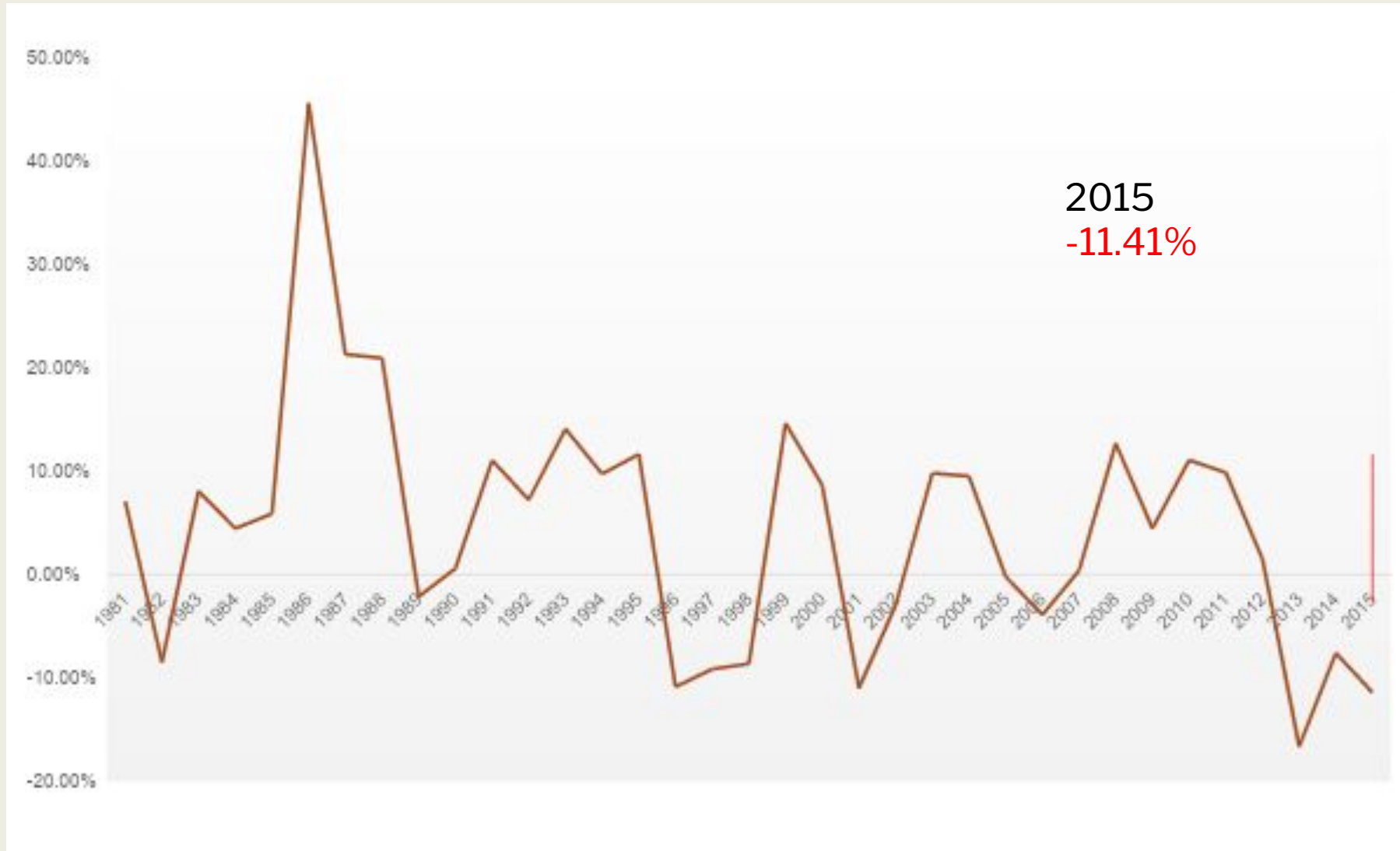
- ❖ Nominal GDP - \$1,086,988 million
- ❖ Real GDP - \$1,152,382 million

2015

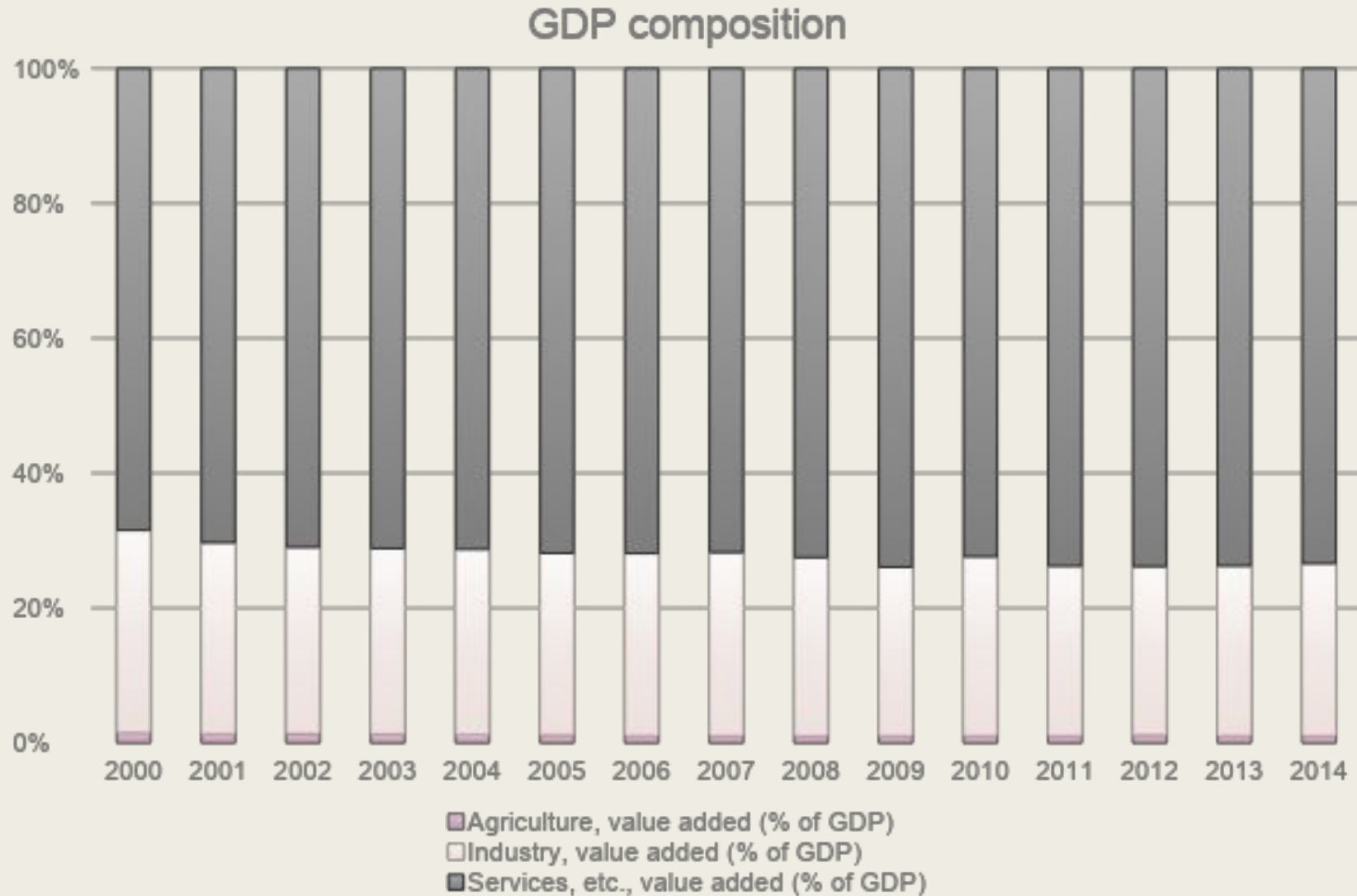
- ❖ Nominal GDP - \$4,383,076 million
- ❖ Real GDP - \$4,341,086 million



GDP Growth



GDP composition



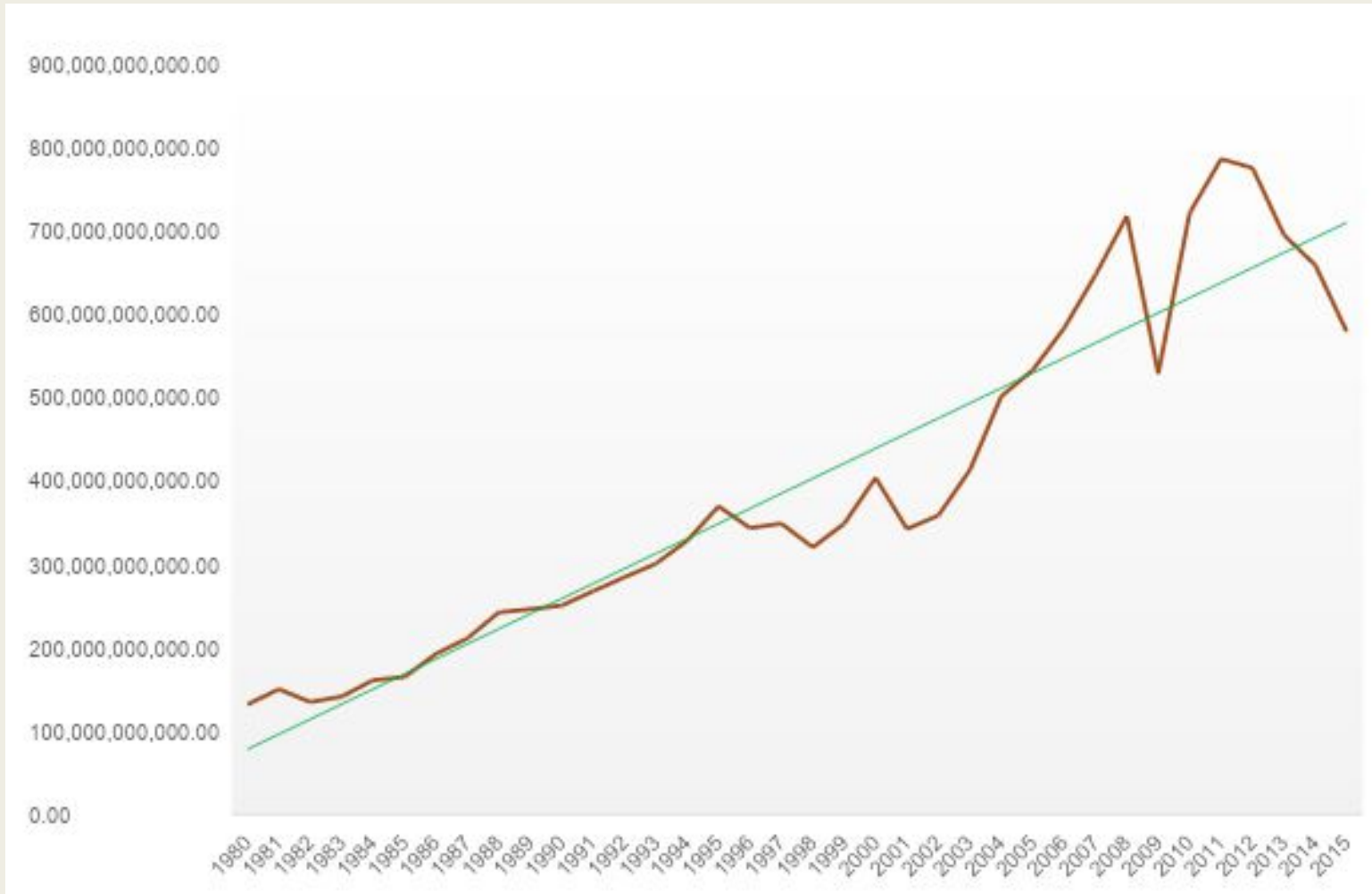
2014

Agriculture: 1.17%

Industry: 26.86%

Services, etc:
71.97%

Real Export



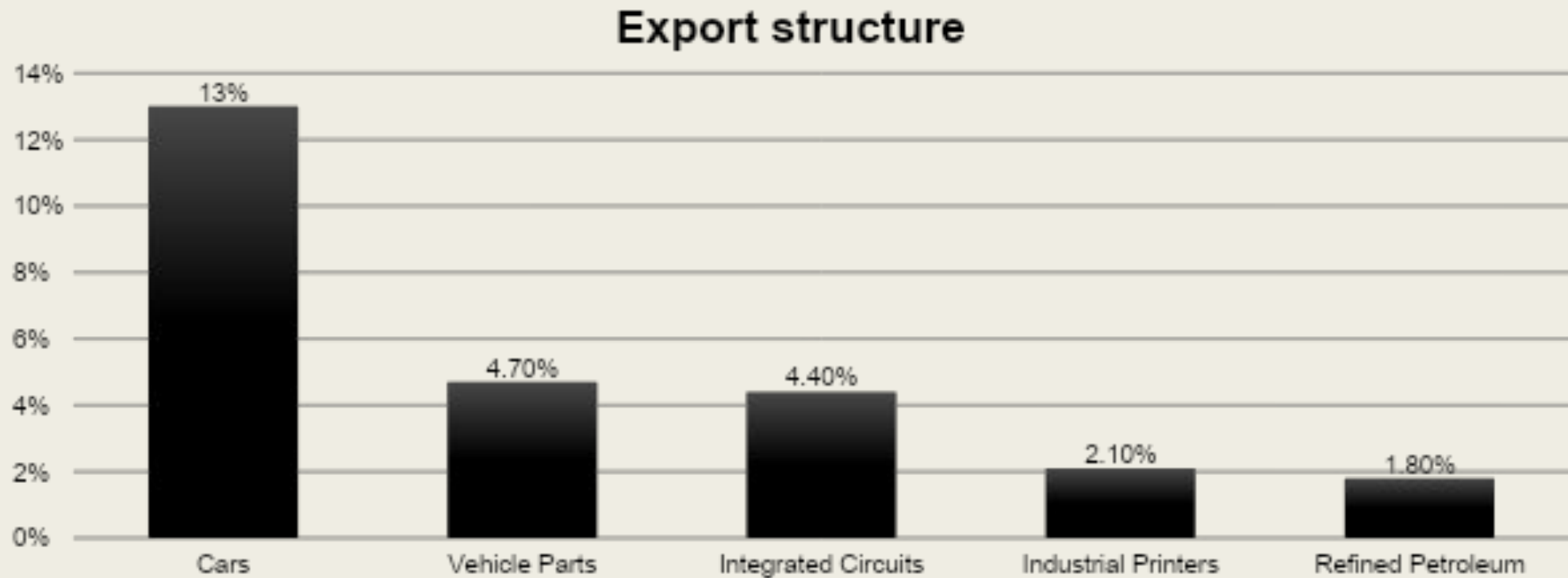
1980

\$132.1 billion

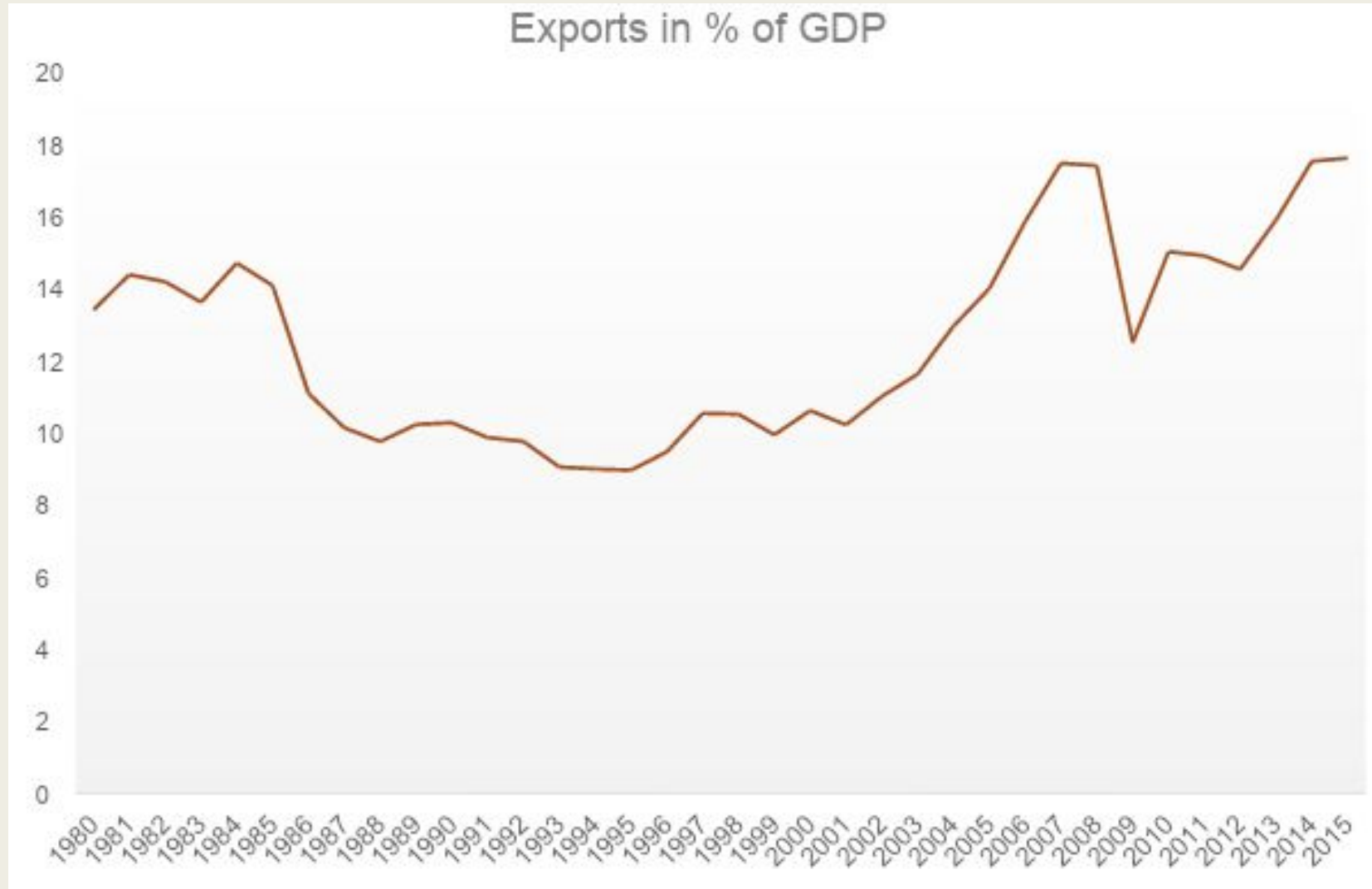
2015

\$580.4 billion

Export Structure



Exports (% of GDP)



GDP and export relationship

- No foreign constraints
- Improved technology
- Increased productivity
- Economies of scale
- More production □ more export

Methodology

- ❖ Unit root test
- ❖ Co – integration test
- ❖ Vector Autoregressive model

Unit root test

■

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=1}^{p^{**}} \beta_i \Delta y_{t-1} + \varepsilon_t$$

■ $H_0: \gamma = 0$ (Non-stationary)

■ $H_A: \gamma < 0$ (Stationary)

	At level				At 1 st difference		
Variables	Test statistic	Critical values	Prob.*		Test statistic	Critical values	Prob.*
Export	1.7930	-1.61	0.083		0.38624	-1.61	0.702
GDP	1.2621	-1.61	0.217		2.0567	-2.60	0.048

➤ Non-stationary at level, but stationary at first difference

Co - integration test

- $$\Delta e_t = \gamma e_{t-1} + \sum_{i=1}^p \beta_i \Delta e_{t-1} + \varepsilon_t$$
- H_0 : non-stationary residuals (no co-integration exists)
- H_A : the residuals are stationary (co-integration exists)

Variables	Test statistic	Critical values	Prob.*
residuals	-7.3375	-3.67	0.044

-7.3375 < -3.67 , therefore, we can reject the null

- The GDP and Exports are co-integrated

VAR model

Short run relationship	Prob.*	Significance level
GDP → Export	0.534	0.05
Export → GDP	0.259	0.05

- $DX(-1)$ and $DY(-1)$ are not significant
- No short-run effect from exports to GDP
- No short-run effect from GDP to exports

Conclusion

- *Decline in Real GDP and Real Exports*
- *Unit root test* – series are non-stationary
- *Co-integration test* – real GDP and real Export are co-integrated
- *VAR model* – there is no short term relationship of GDP and Export

References

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