



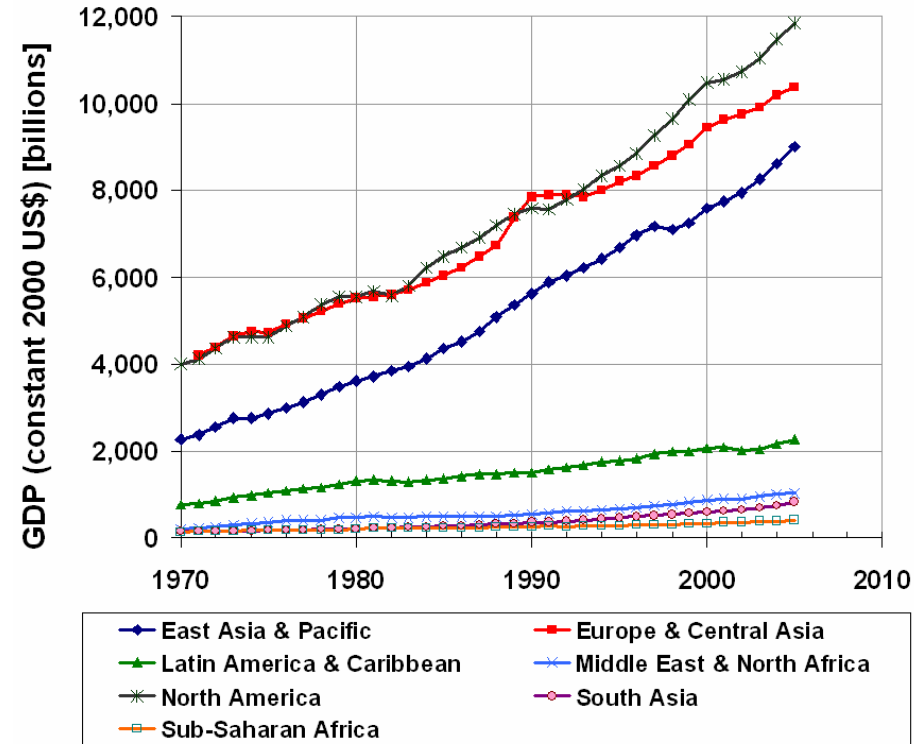
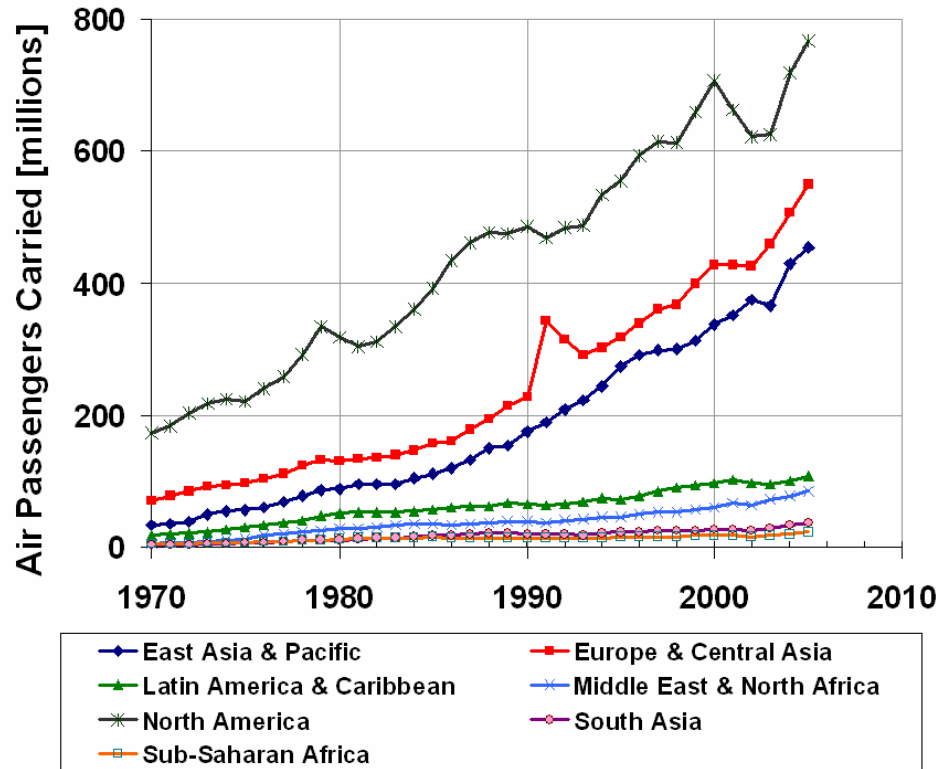
MIT International Center for Air Transportation

Analysis of Interaction between Air Transportation and Economic Activity

Masha Ishutkina and Prof. John Hansman

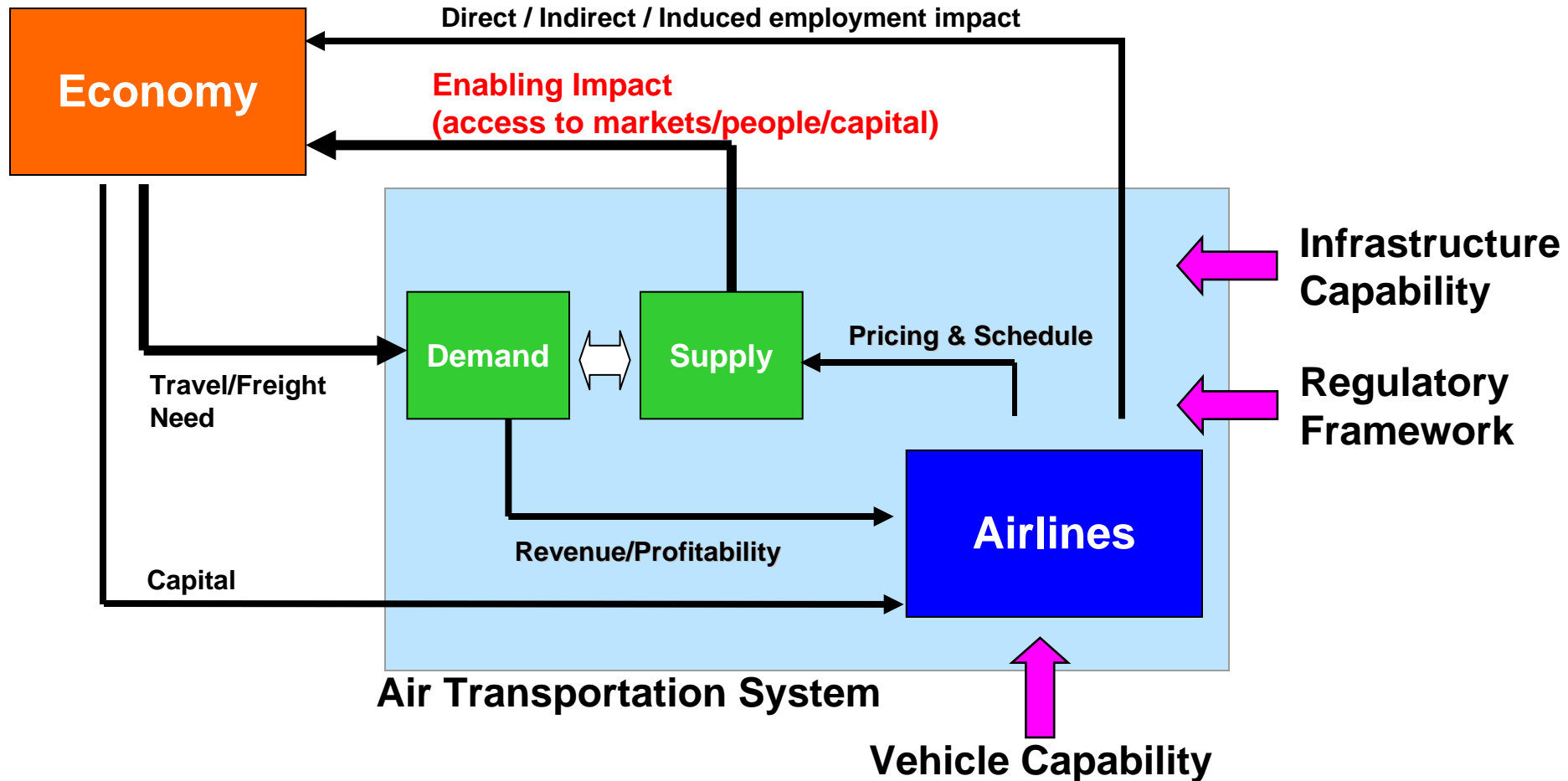
November 6th, 2008

Passenger and GDP Trends Aggregated by Region

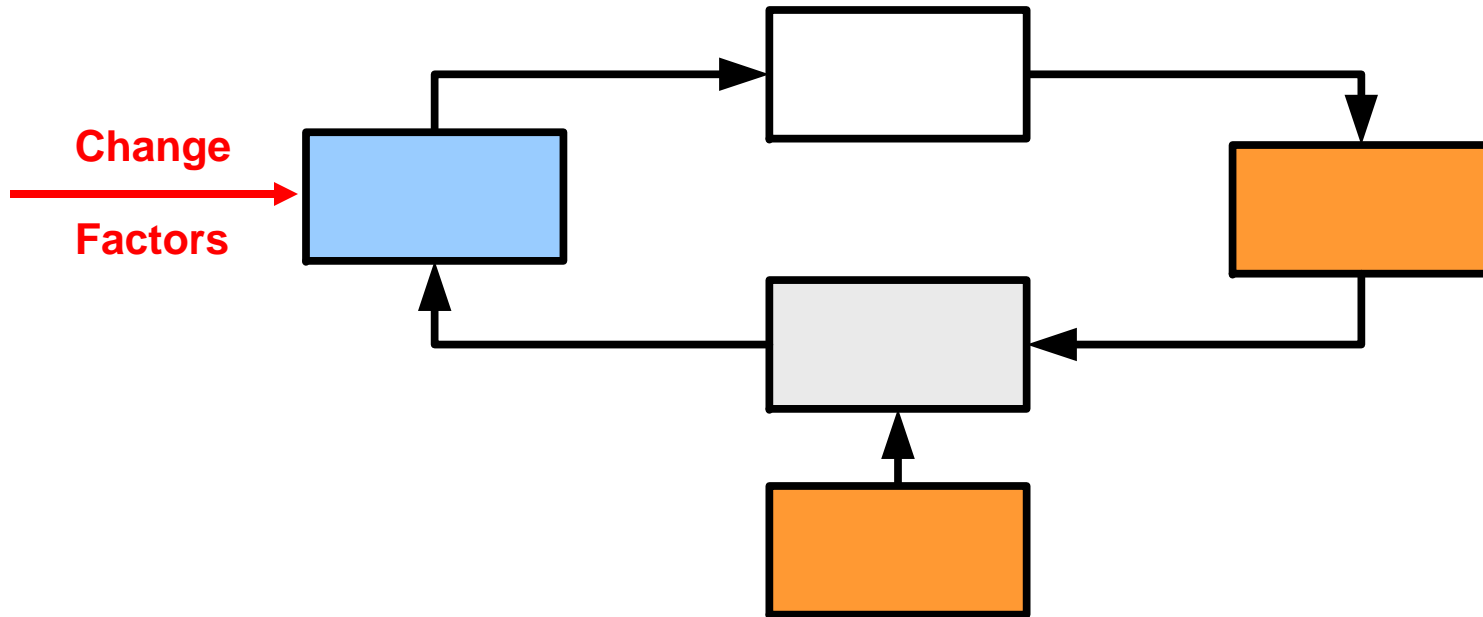


■ Aggregate data exhibit correlation between GDP and Air Passengers.

Feedback Relationship between Air Transportation and an Economy



Describing the Enabling Impact



- Enabled Flows are defined as flows which directly impact the Economic Attributes.

- Economic Attributes consist of:

- Factor Conditions: land, labor, capital, institutions, infrastructure
- Demand Conditions
- Firm Strategy

- Interaction Potential is determined by inherent Economic Attributes of the Economy and the Rest of the World.

AT System

E
I

Int
Po



Research Approach

■ Identify Enabled Flows

- Goods
- Investment
- Knowledge
- Services
- Labor
- Remittances
- Tourism

■ Describe how Enabled Flows affect Economic Attributes

- Factor Conditions: land, labor, capital, institutions, infrastructure
- Demand Conditions
- Firm Strategy

■ Identify which factors may stimulate or the suppress the development of Air Transportation System.

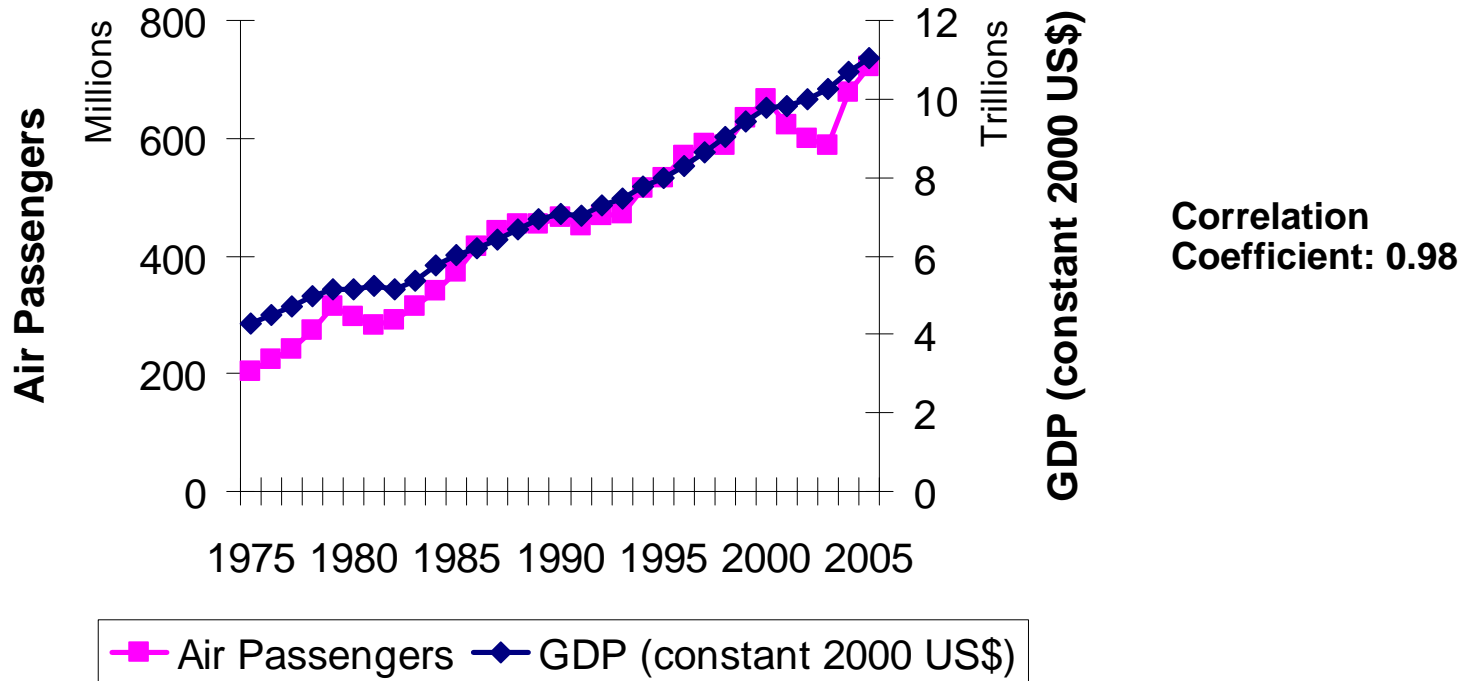


Data Analysis

- **We use comparative country-level data analysis to identify different behaviors.**
- **Original Dataset: 139 countries for years 1975-2005.**
- **Data Sources**
 - ICAO Air Transportation Passenger data
 - The air transport data represent the total (international and domestic) scheduled passenger traffic carried by the air carriers registered in a country.
 - The World Bank GDP data
- **Data Limitations**
 - Discontinuation or addition of a particular carrier may cause significant changes in the data but not in the actual traffic
 - In liberalized environments airlines not registered in a particular country may carry local traffic.
 - Data for small countries may reflect the financial and capacity issues faced by a single carrier.

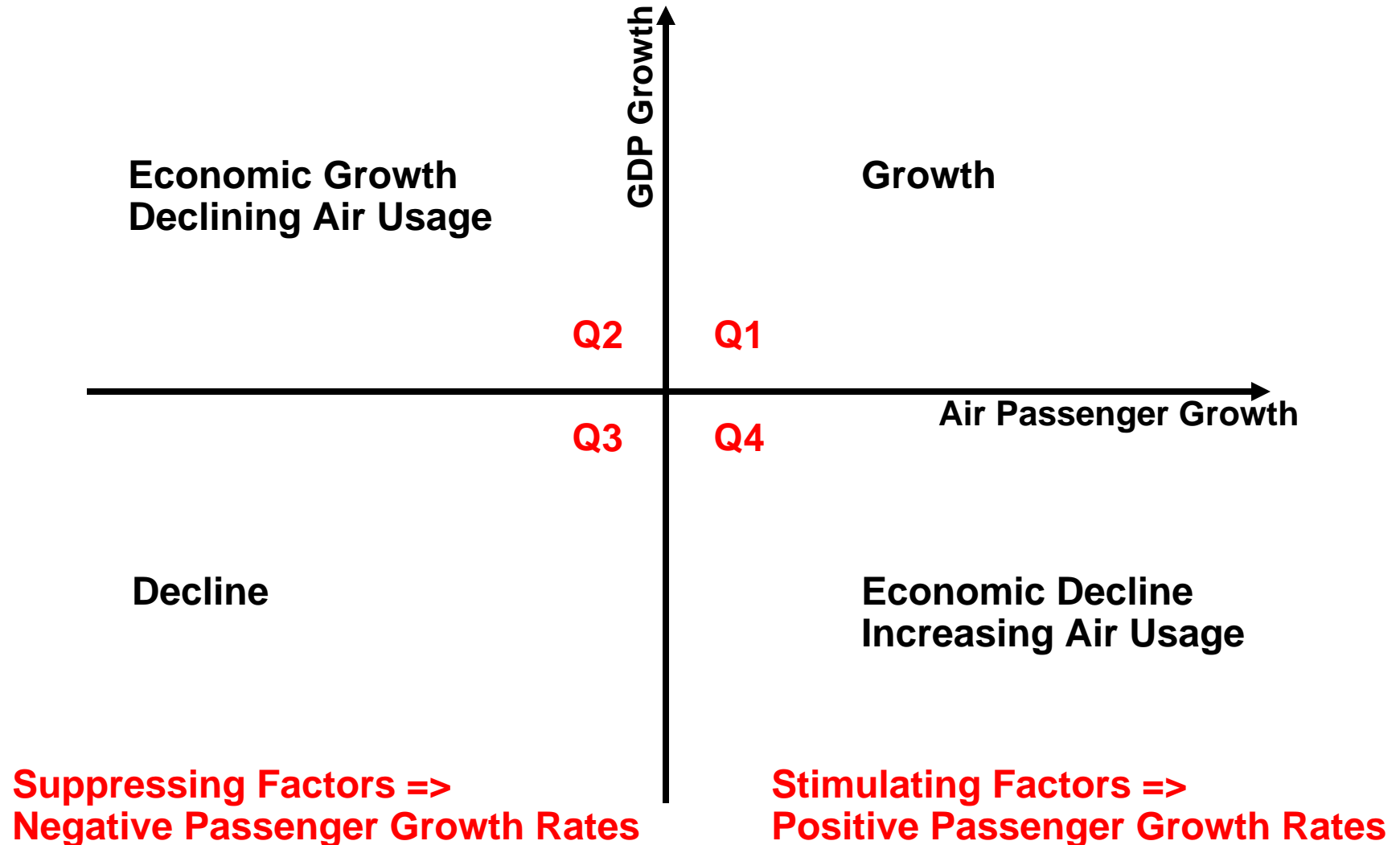
Explore Variability in the Growth Patterns

United States

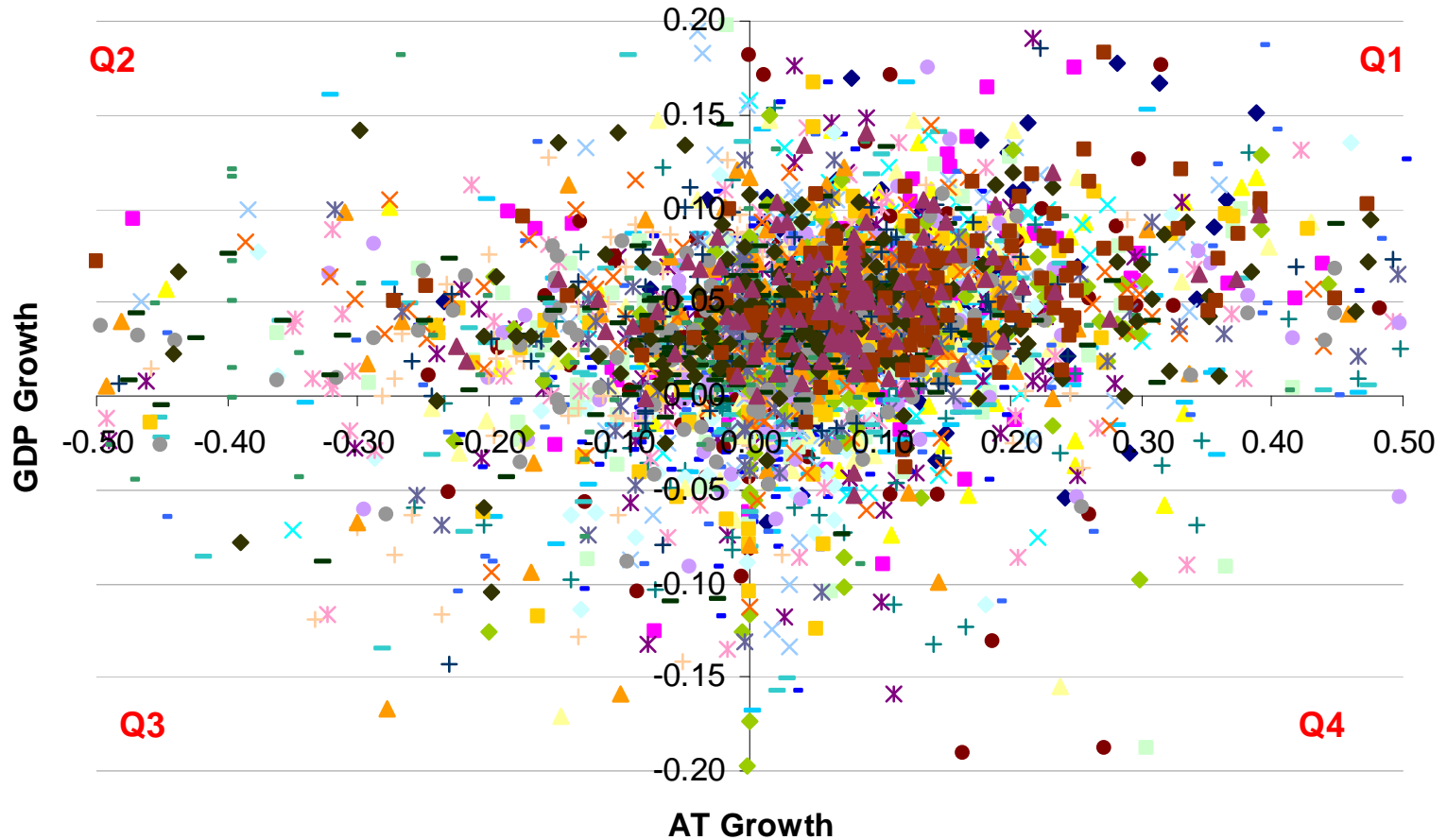


- Use temporal data to determine the correlation between passenger and GDP.
- Use Air Passengers and GDP growth patterns to identify different behaviors.

Stimulating and Suppressing Growth Behaviors

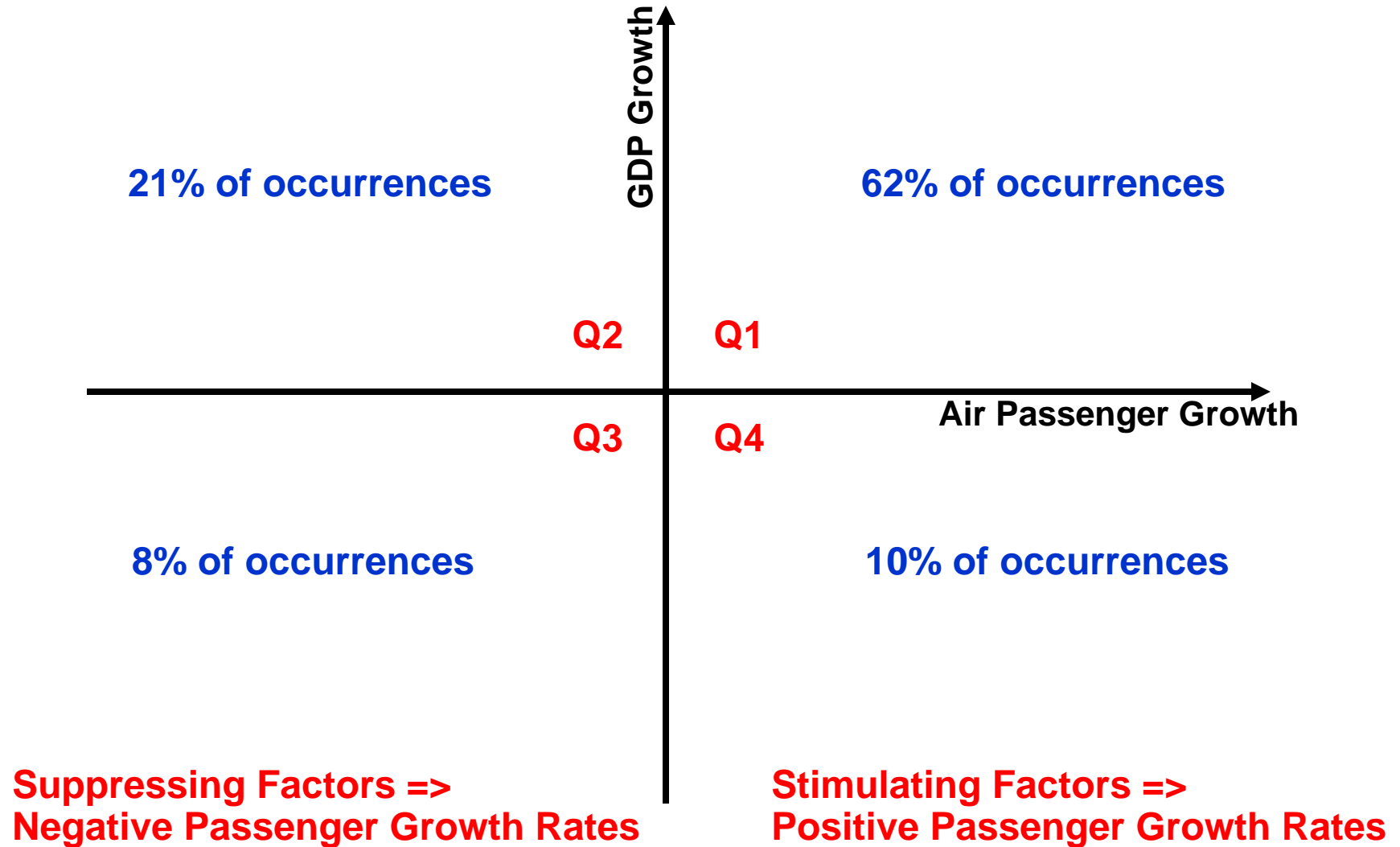


Yearly Growth Rates for 139 Growth Countries



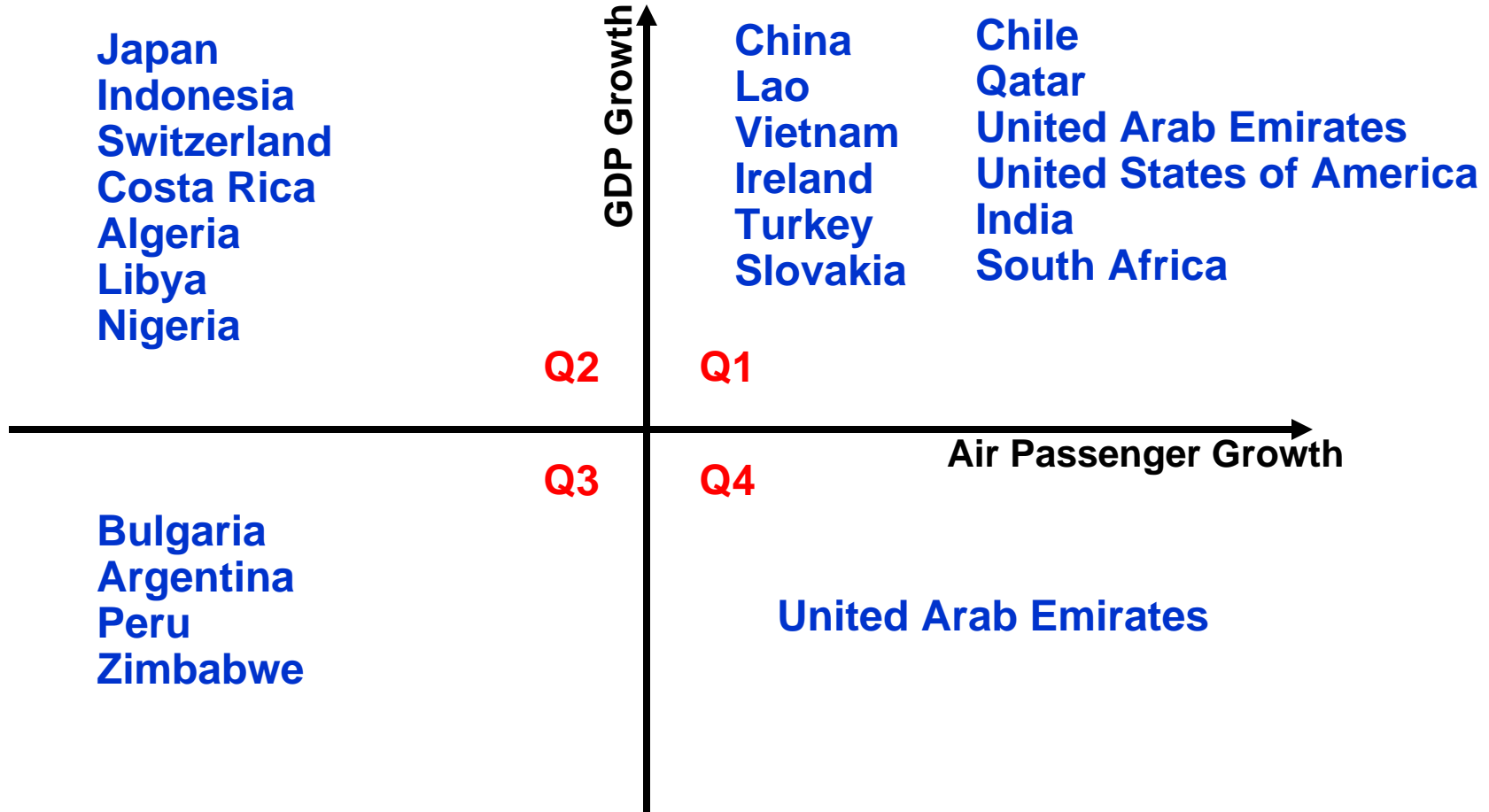


Four Growth Behaviors: Number of Occurrences

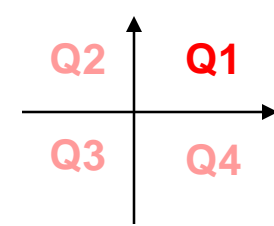




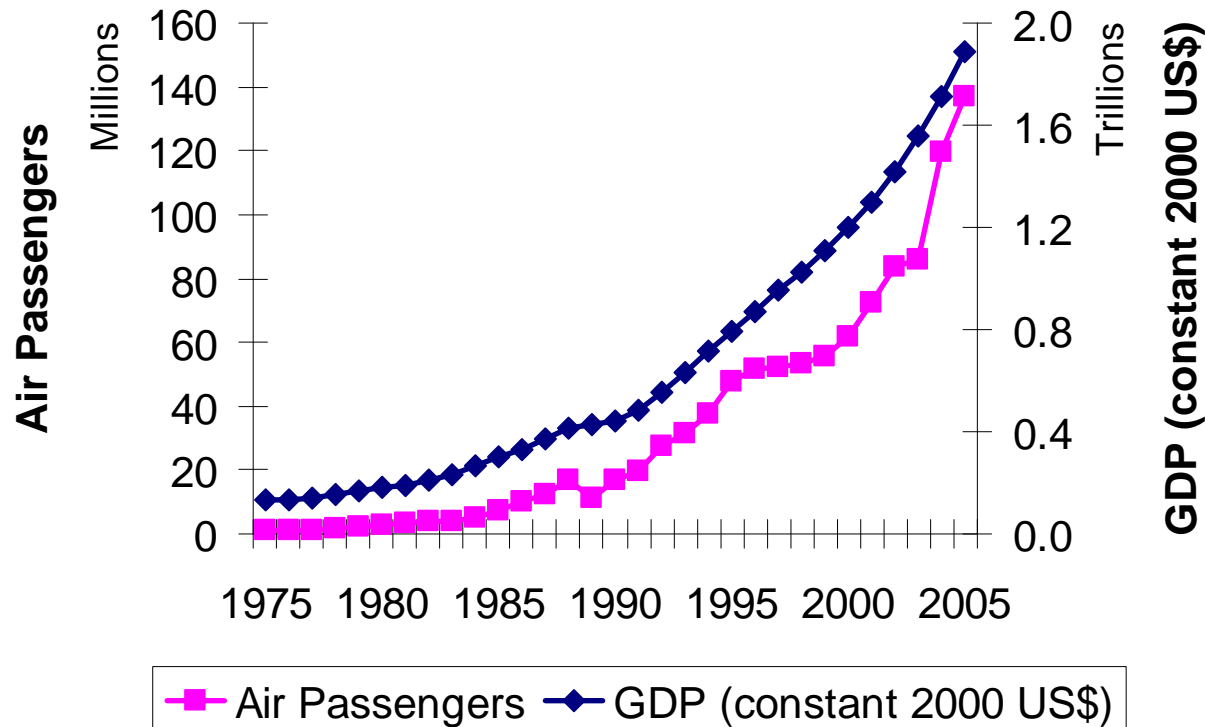
List of 28 Case Studies



**Large changes in year-on-year growth rates:
Belgium, Russian Federation, Ecuador, Kuwait, Madagascar**



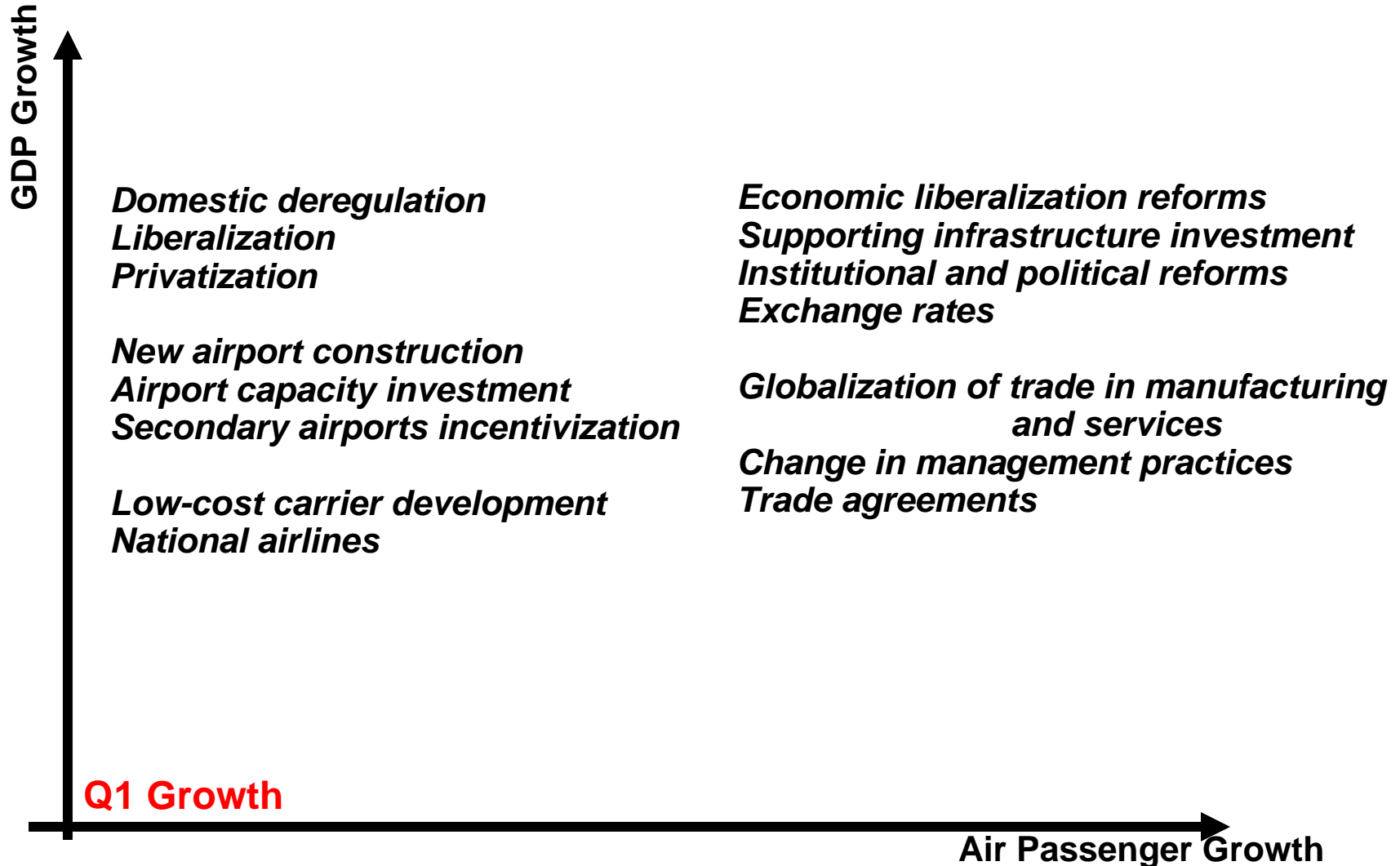
China

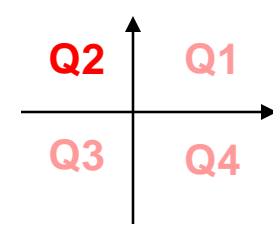


- 1978+: economic liberalization reforms, supporting and aviation infrastructure investment
- 1987: Civil Aviation Administration of China separated from airline management
- 1997: partial domestic deregulation

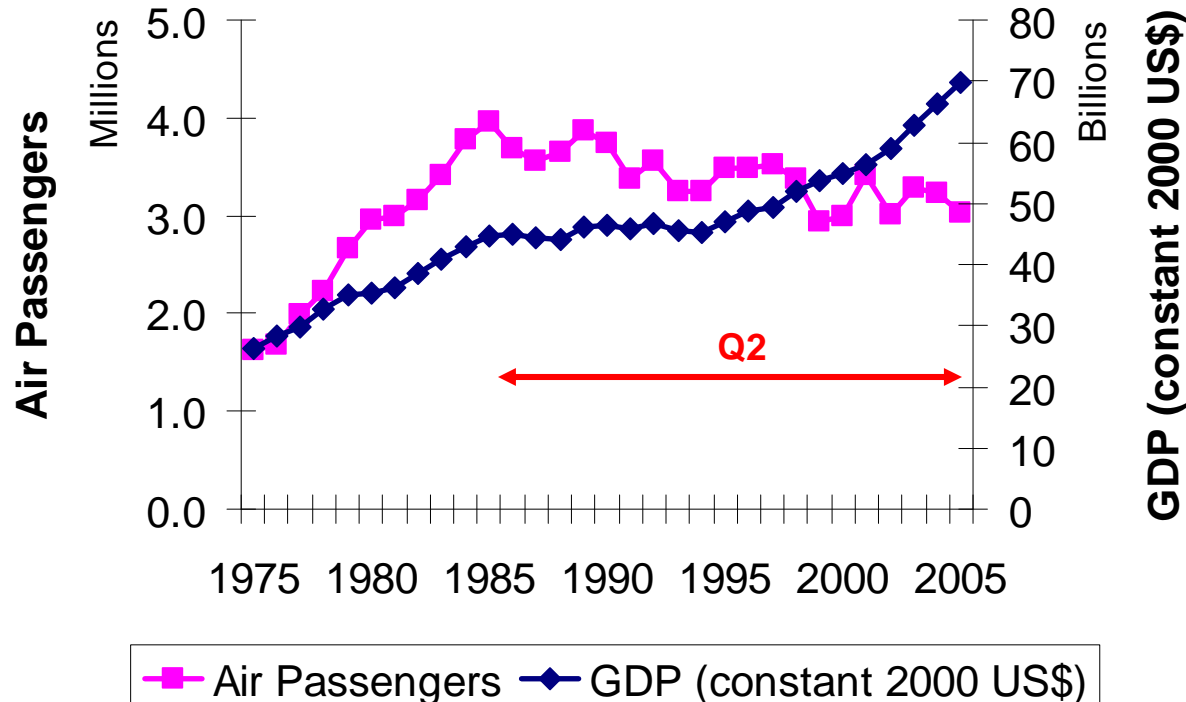


Identified Reasons behind Changes in the Growth Rates





Algeria

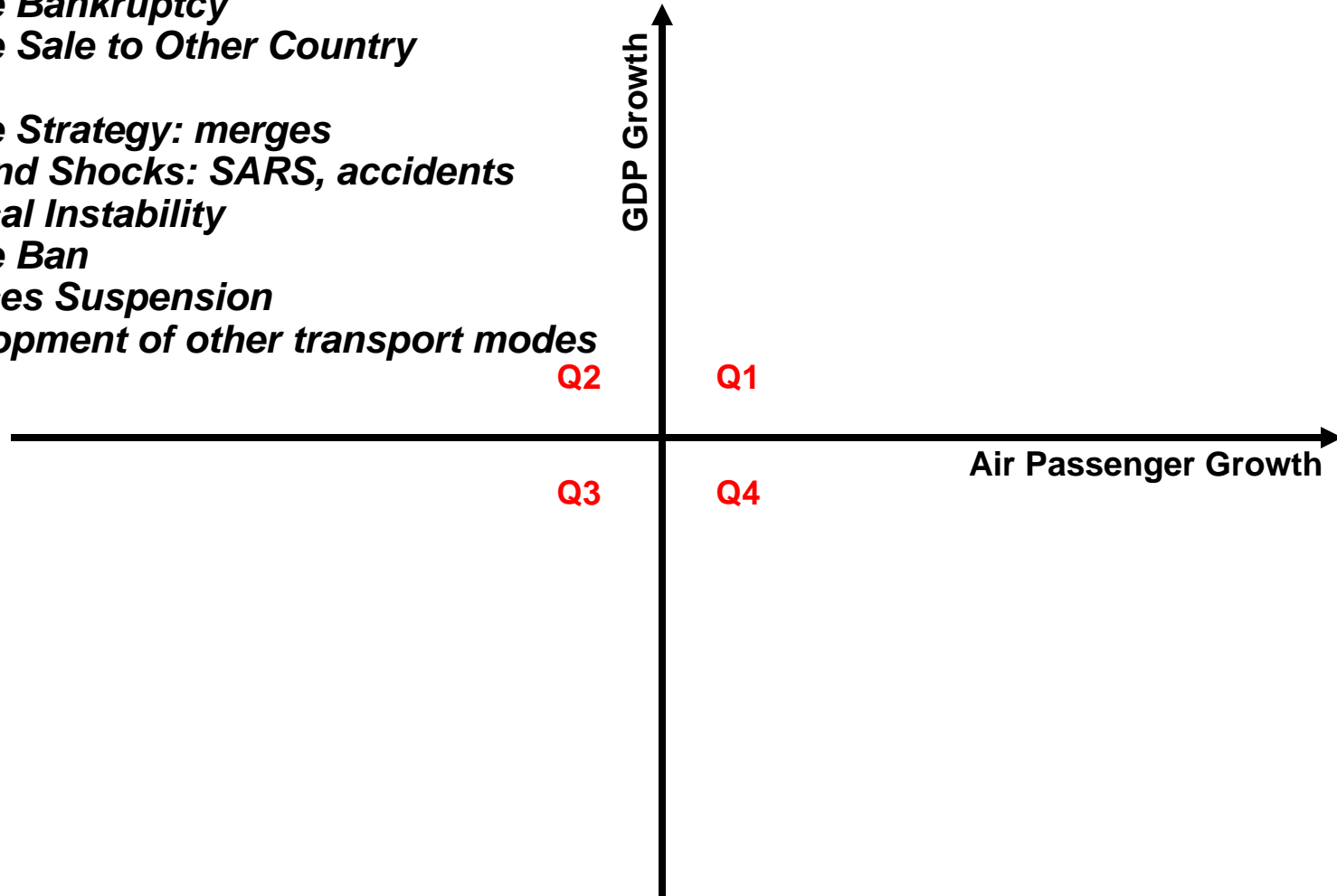


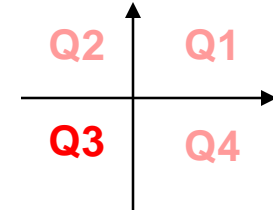
- 1992-2002: civil unrest marked by violence and terrorism
- 1994-1999: foreign airlines services suspension
- 1990s: macroeconomic stabilization policies: the hydrocarbons sector accounts for nearly 30% of GDP, and over 97% of export earnings



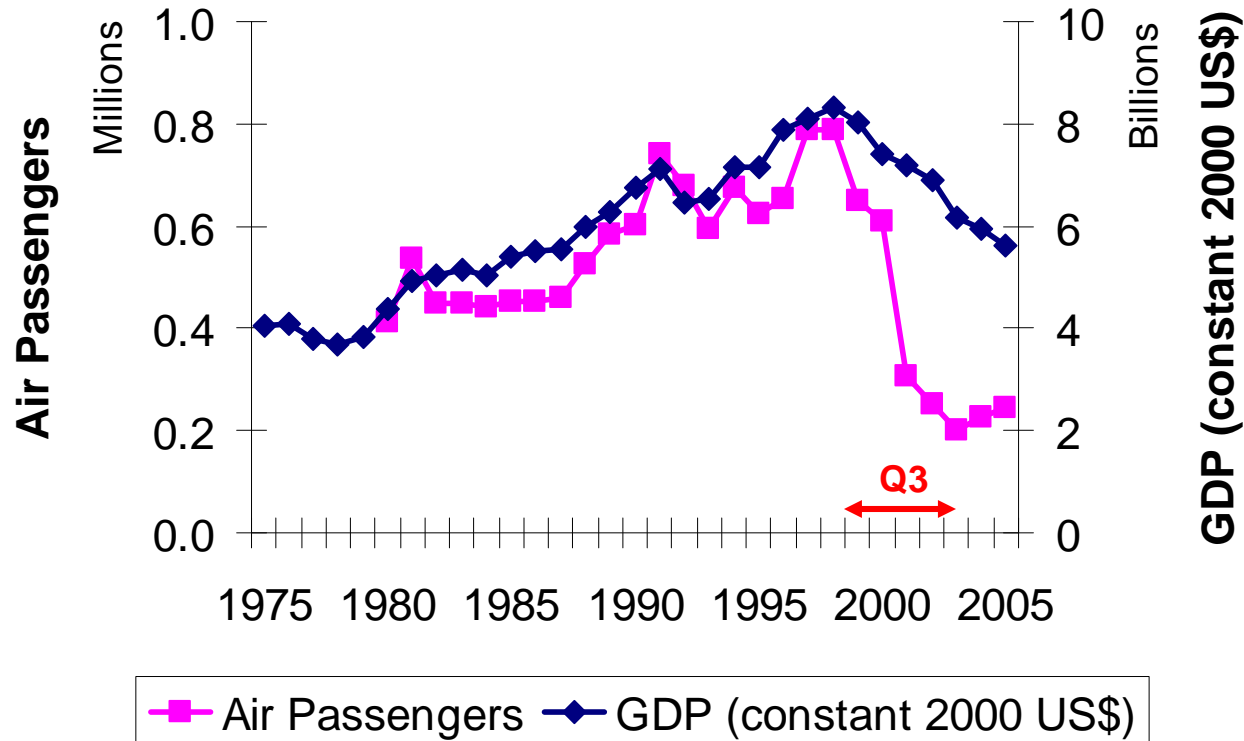
Identified Reasons behind Changes in the Growth Rates

- Airline Bankruptcy*
- Airline Sale to Other Country*
- Airline Strategy: merges*
- Demand Shocks: SARS, accidents*
- Political Instability*
- Airline Ban*
- Services Suspension*
- Development of other transport modes*





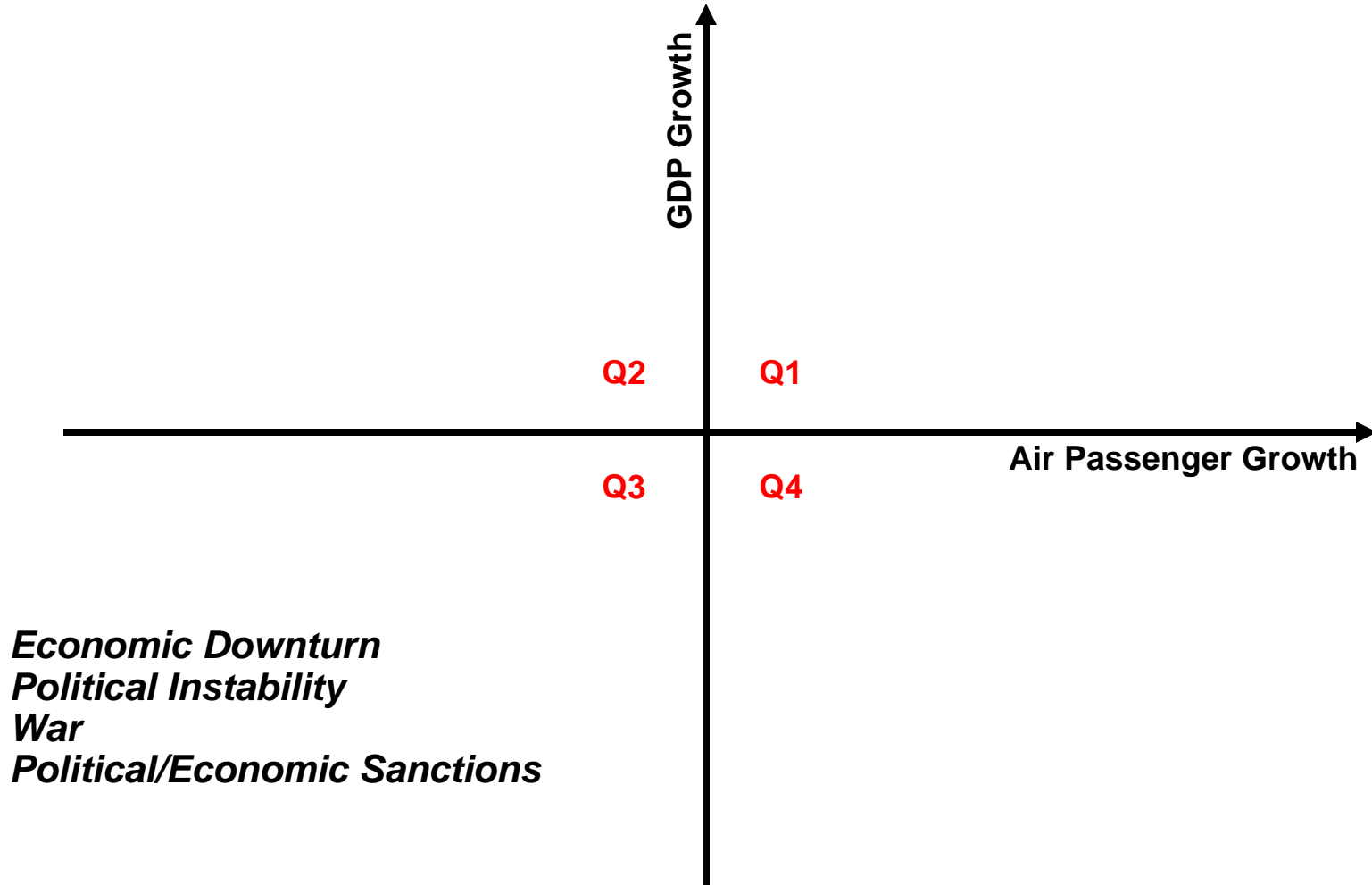
Zimbabwe

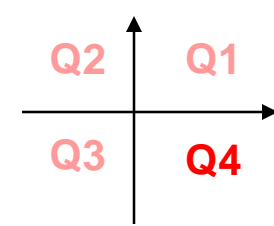


- 1998: deteriorating political climate
- 2000: economic reforms leading to hyperinflation, fuel shortages

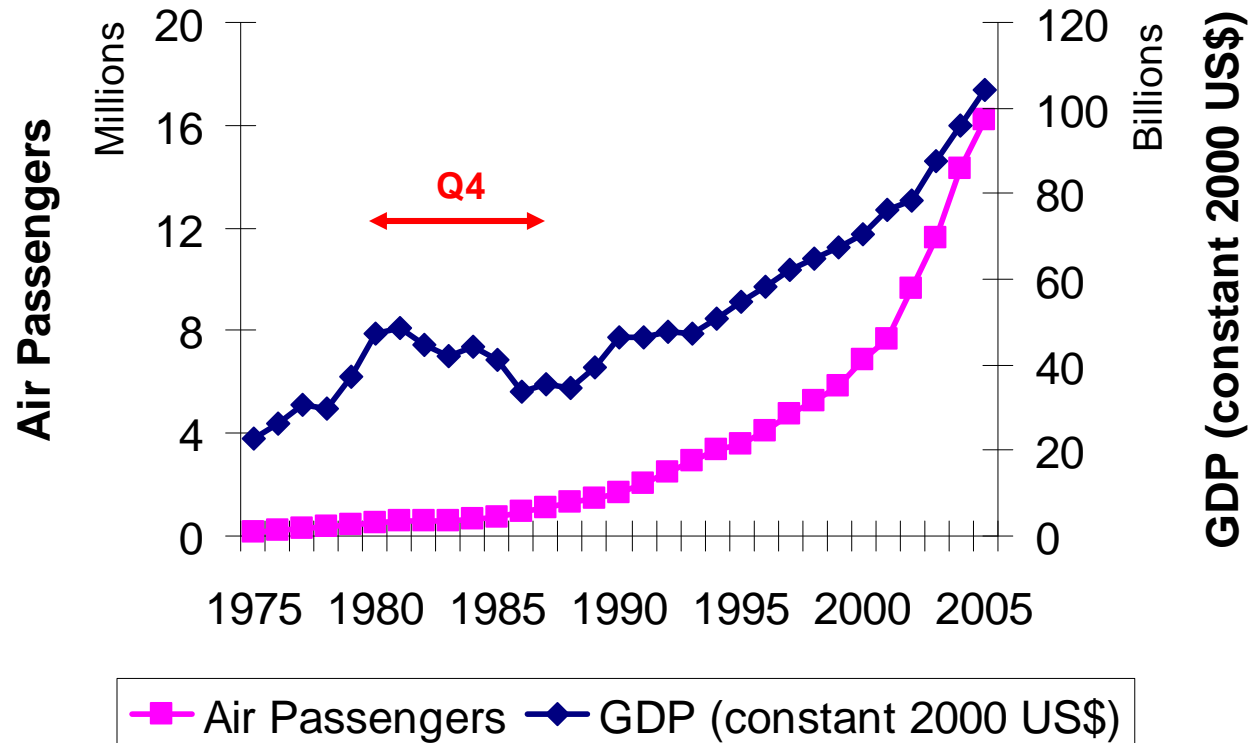


Identified Reasons behind Changes in the Growth Rates



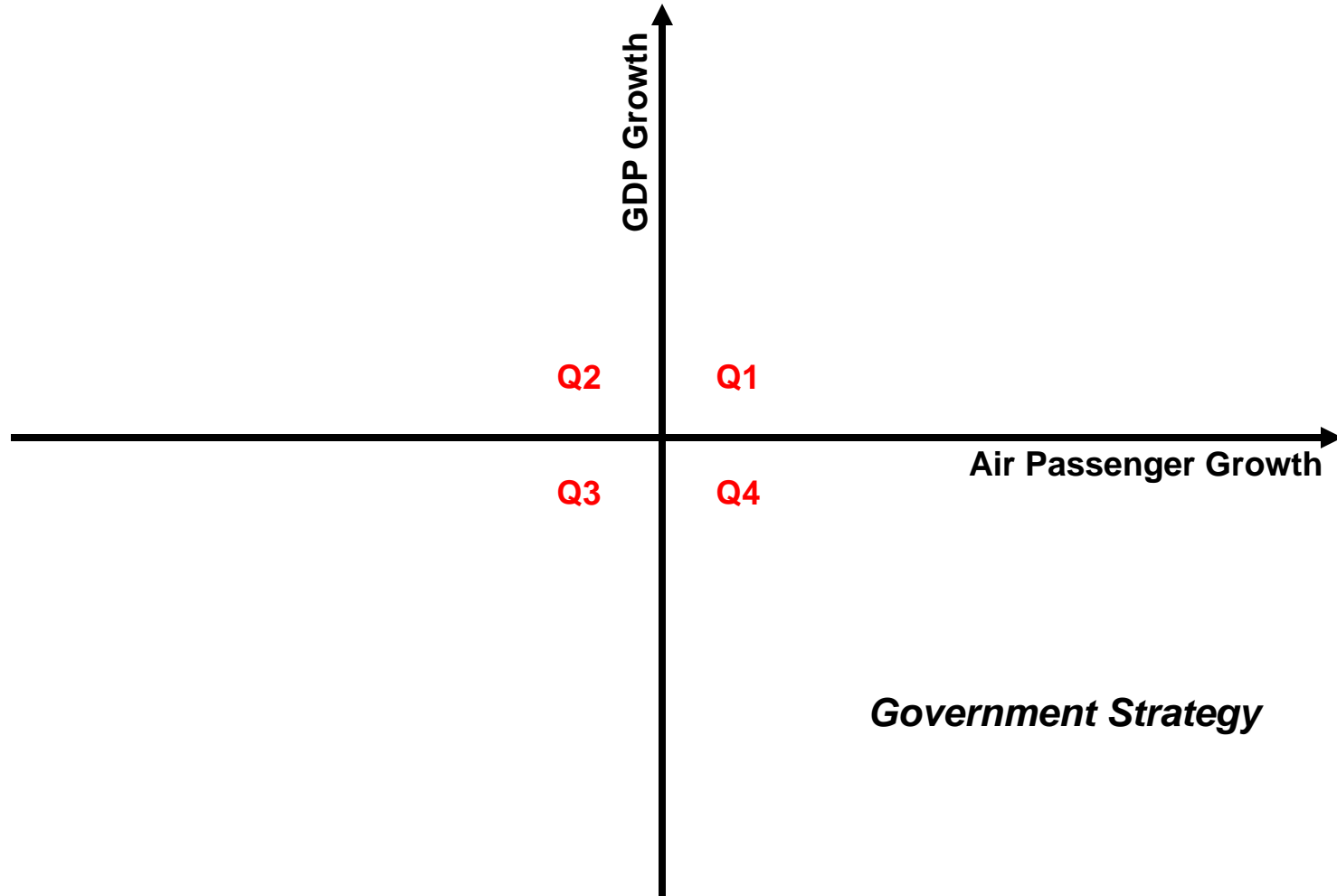


United Arab Emirates

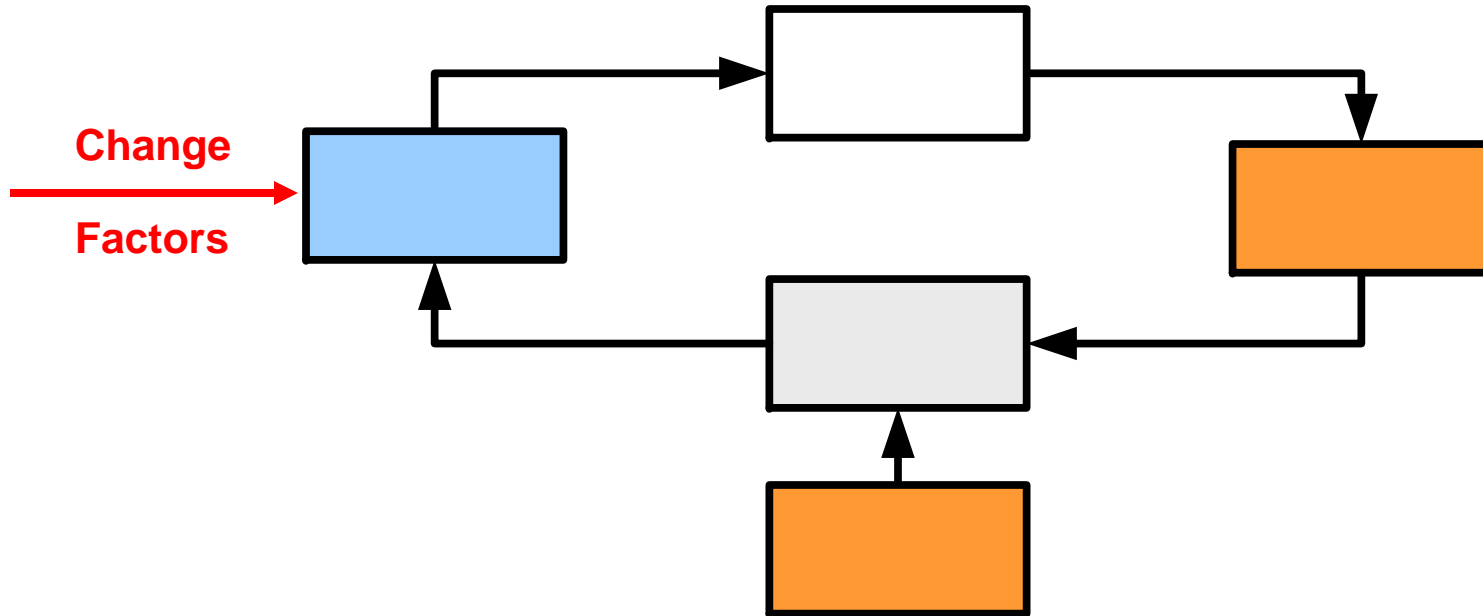


- Early 1980s: government policy to grow the air transportation sector.
- High air passenger growth rate sustained since then.

Identified Reasons behind Changes in the Growth Rates



Further Work



- Perform detailed case study analysis to describe the enabling mechanisms.
- Describe how Economic Attributes affect the Interaction Potential and the resulting Air Transportation Demand.
- Develop a quantitative model describing the evolution of a particular mechanism in an economy.

AT System

E
I

Int
Po