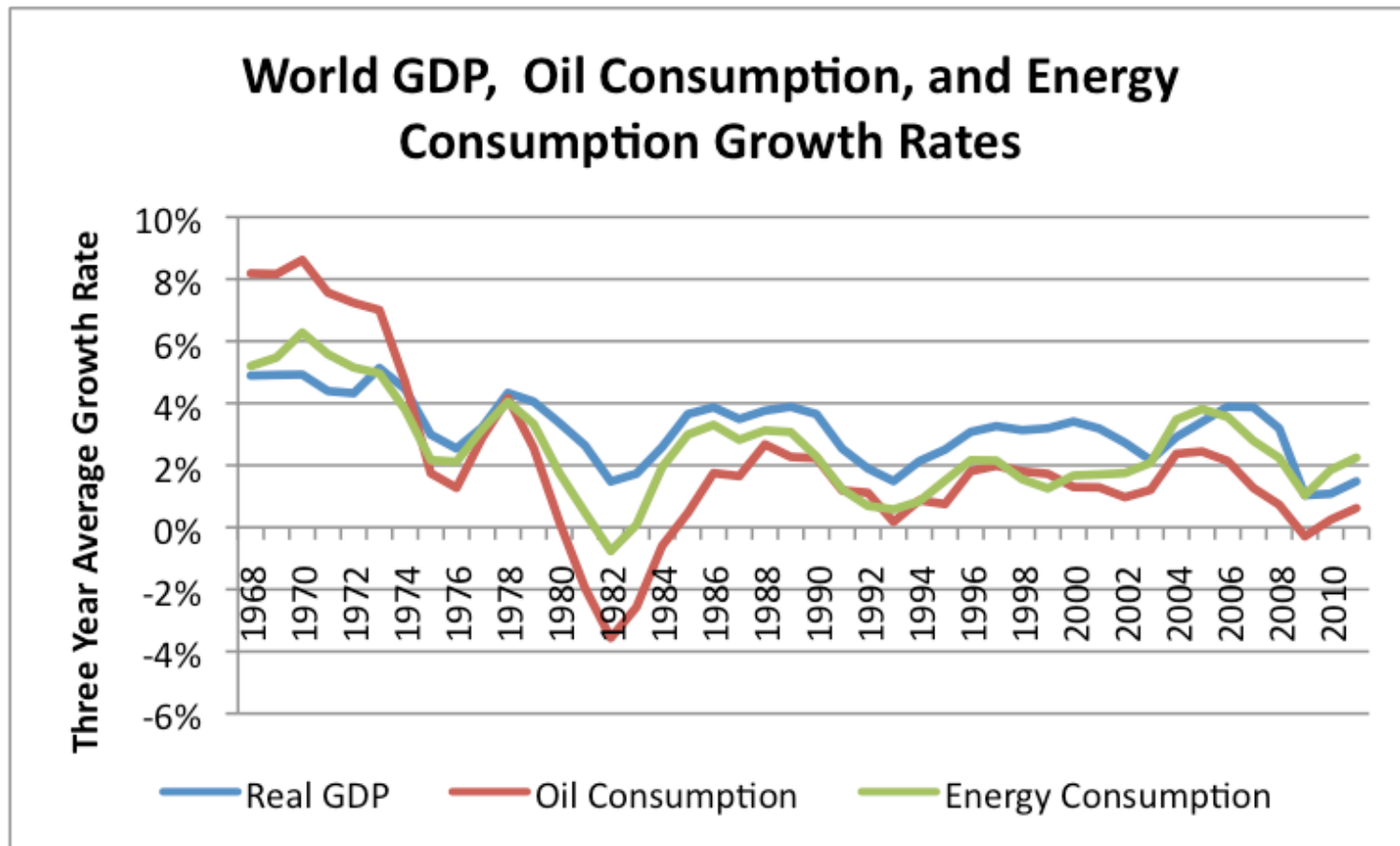


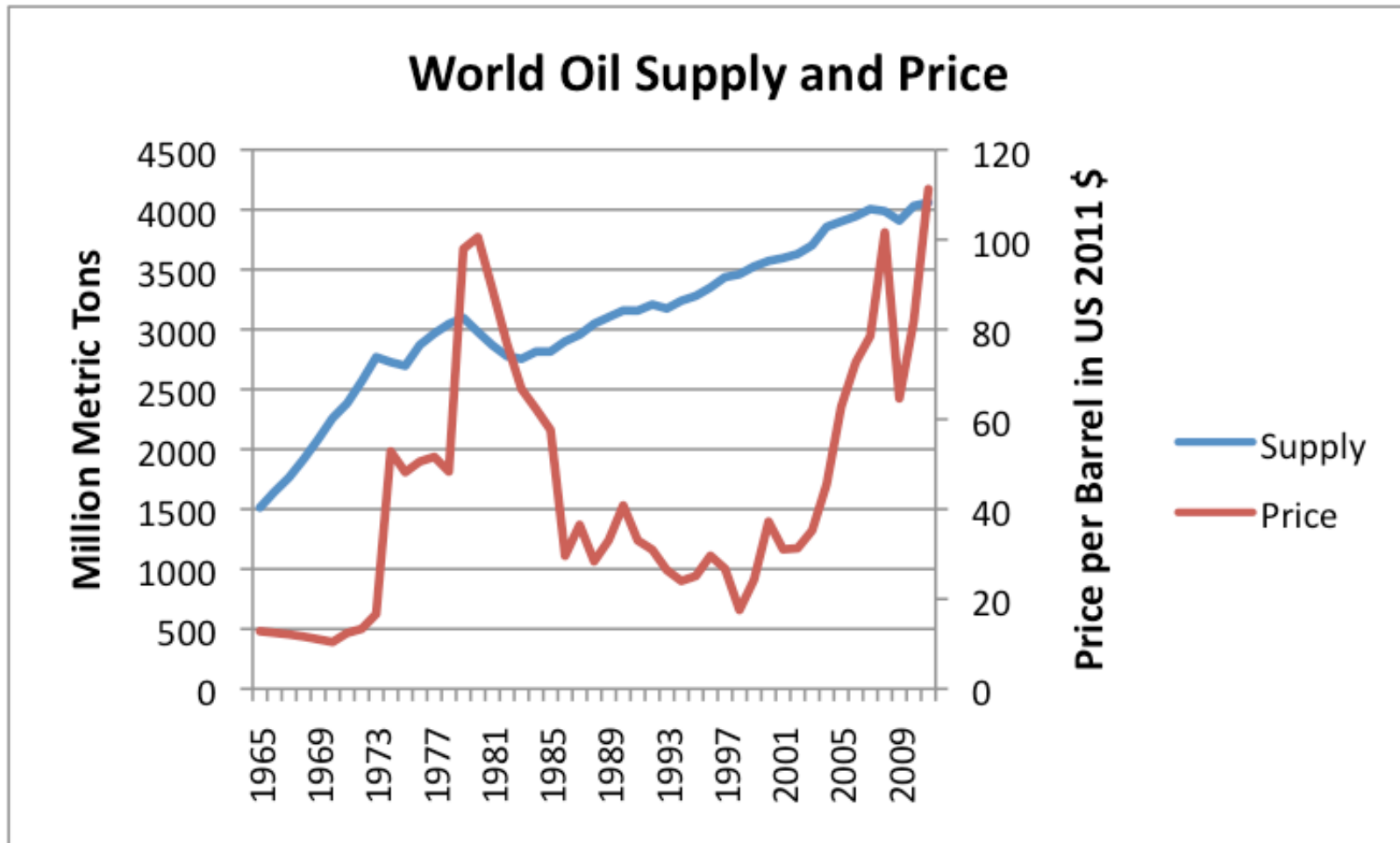
Financial Issues Affecting Energy Security

Gail E. Tverberg – Oct. 26, 2012 – AES 2012

World GDP, Oil Consumption, and Energy Consumption move in tandem, downward

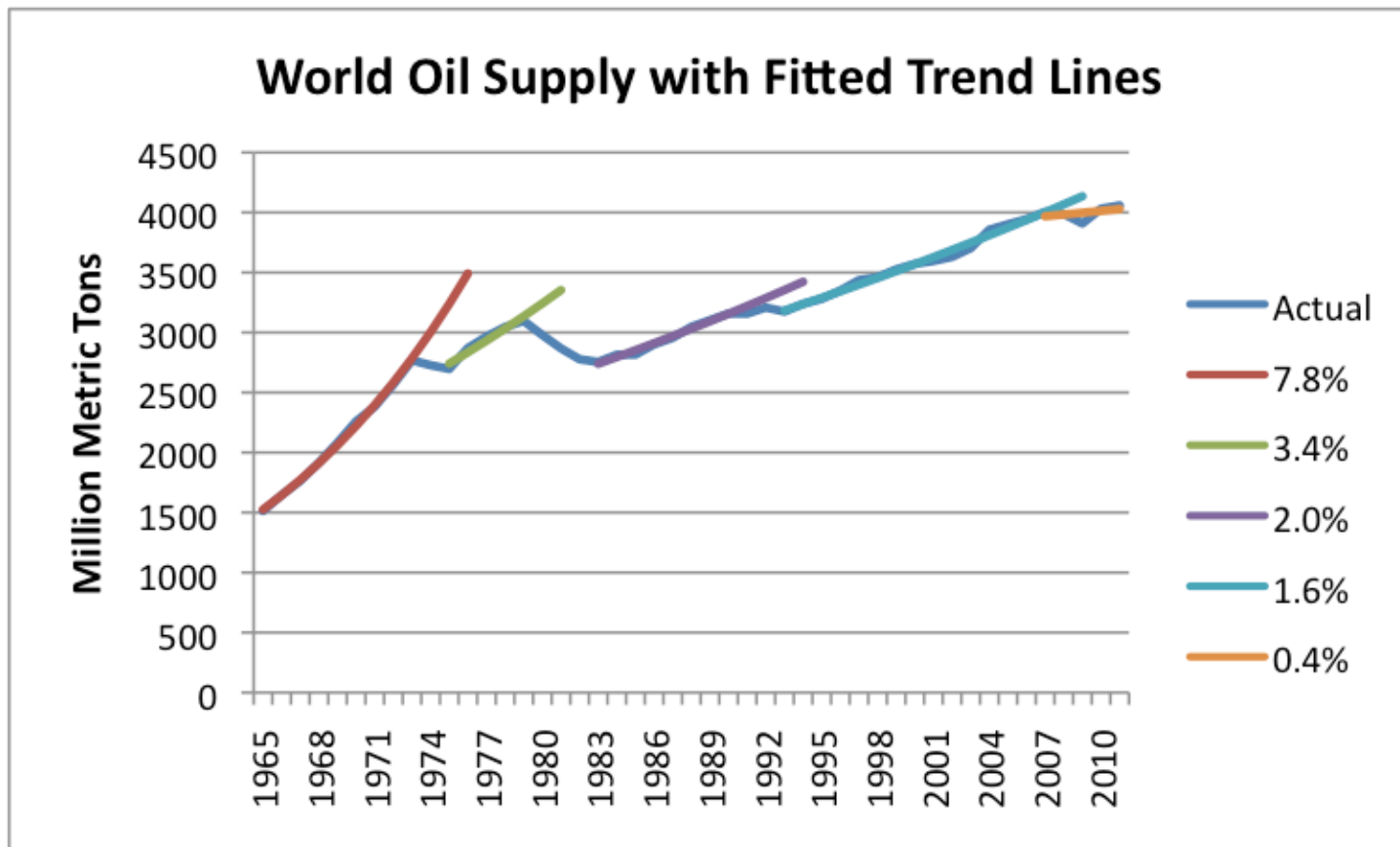


Oil supply recently growing slowly, price high



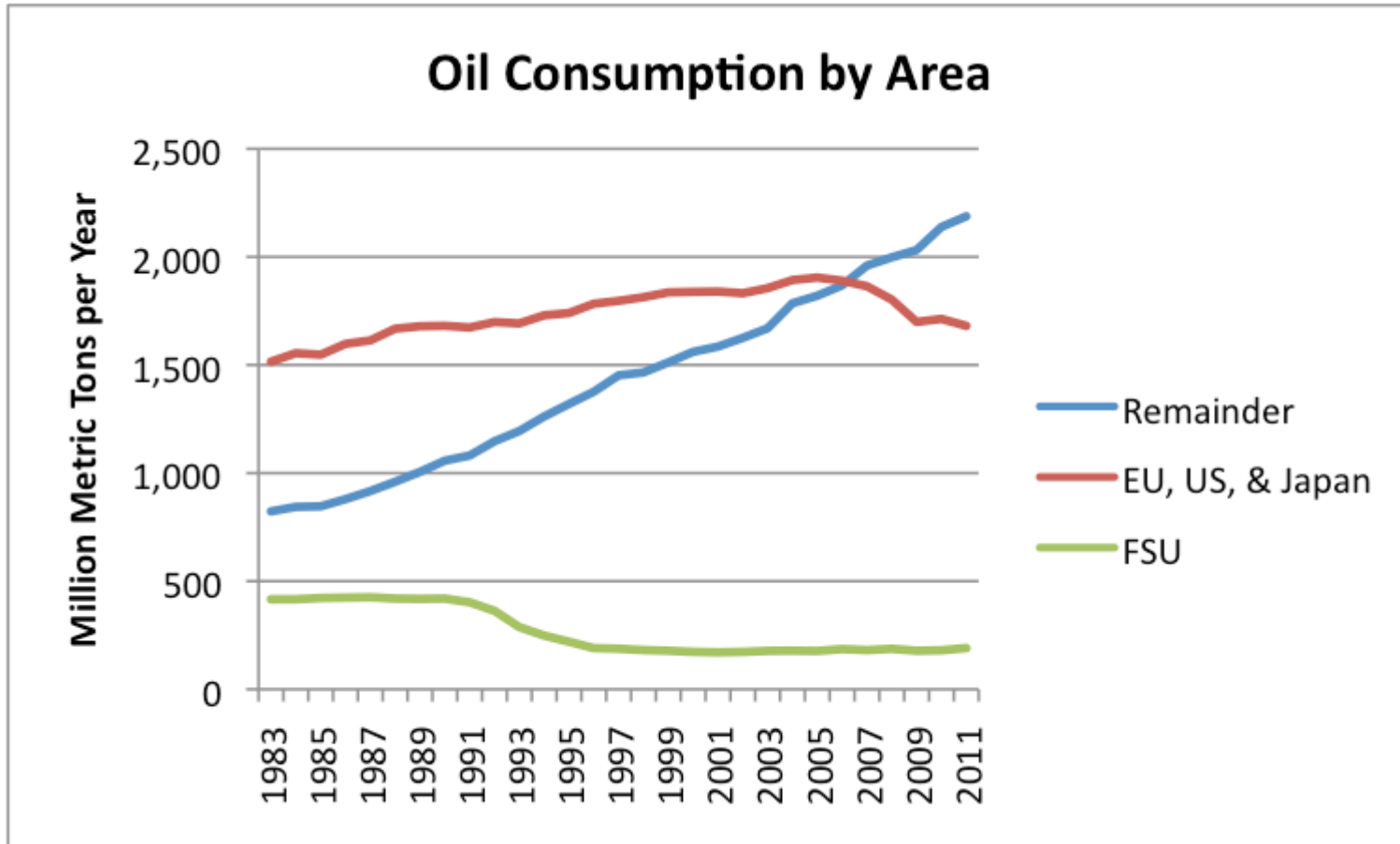
Based on data from BP's 2012 Statistical Review of World Energy.

Issue is one of slowing growth in oil supply



Based on BP's 2012 Statistical Review of World Energy data

Impact on consumption is very different, for different parts of the world



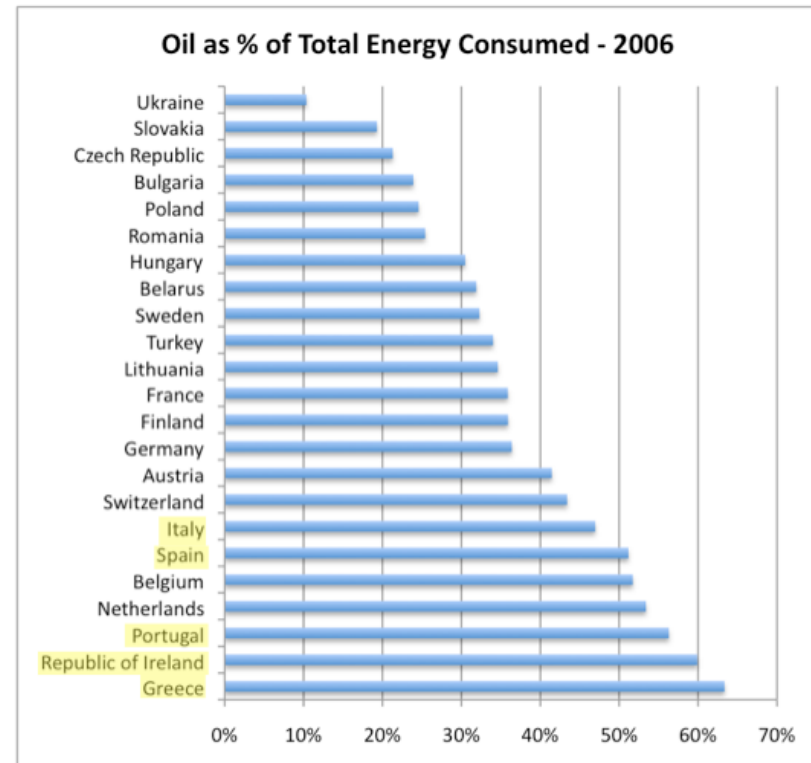
Based on BP's 2012 Statistical Review of World Energy data

Basic Issues – Countries without subsidies

1. High oil prices -> reduced discretionary spending-> layoffs and recession
2. Government tax revenue lower + Government entitlement payments higher = Government in trouble
3. Interest rates rise -> Past debt unaffordable

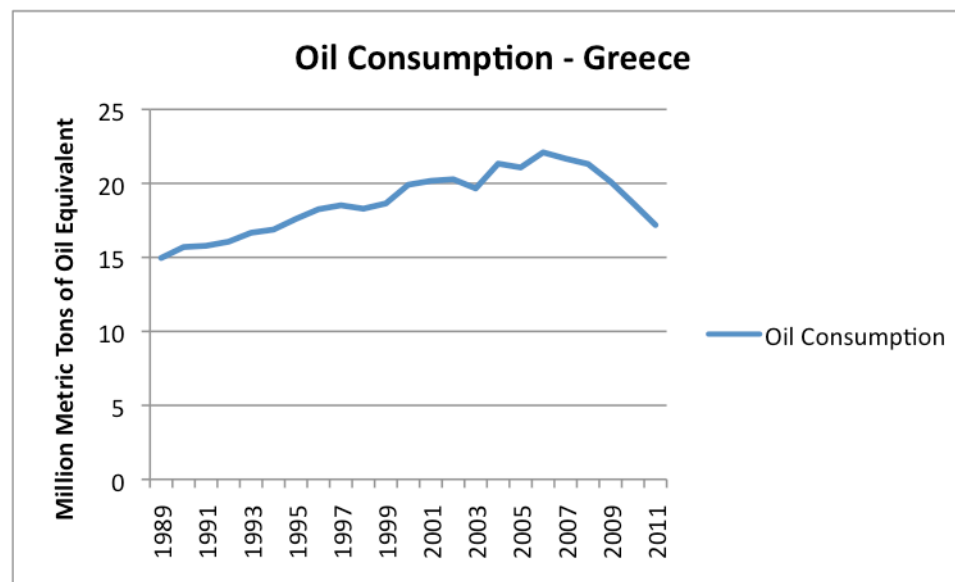
Countries with declining oil consumption at risk for recession

- ▶ Most at risk
 - ▶ Oil importing countries
 - ▶ High oil consumption/ total energy
 - ▶ Can't regulate own currency
 - ▶ Debt from previous high growth
- ▶ Eventually hits lower risk countries, too



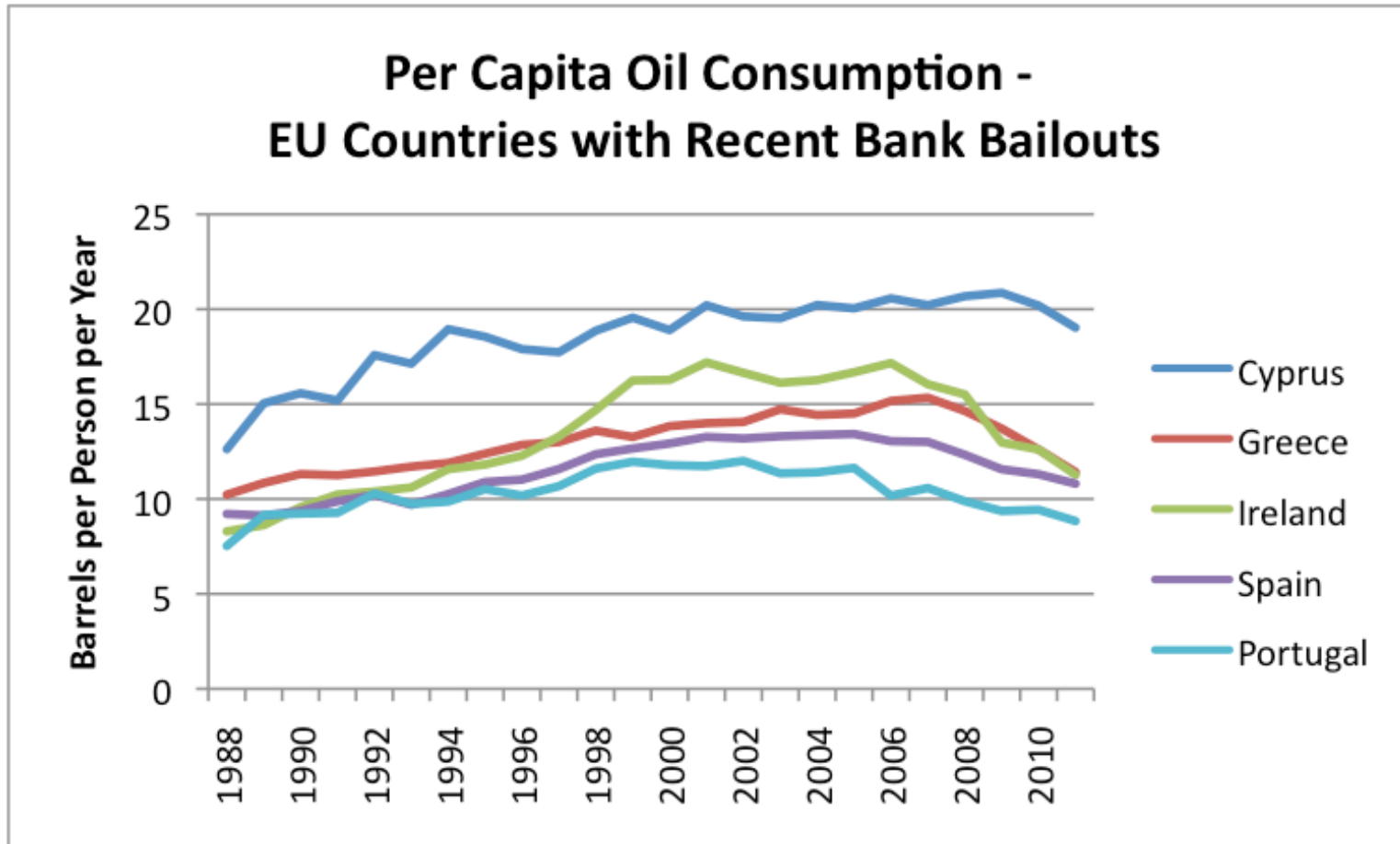
Energy security risk example: Greece

- ▶ Tourism biggest industry – oil dependent
- ▶ Lots of previous debt-based growth



- ▶ Now: Rising unemployment; multinational companies leaving; taxes not sufficient to pay for entitlements

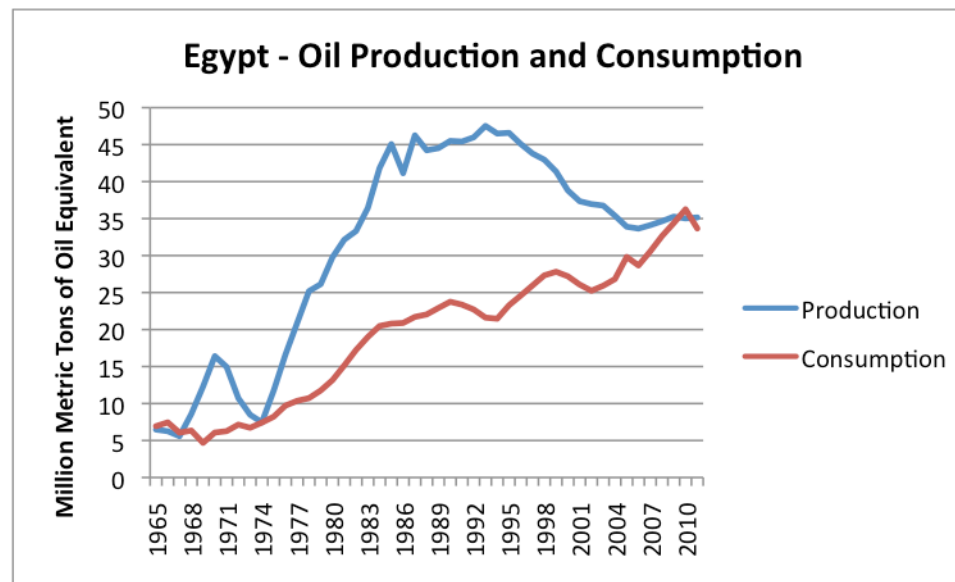
Other European countries with bailouts have similar pattern



Based on data of EIA and BP's 2012 Statistical Review of World Energy

Egypt: Oil exporter becoming importer

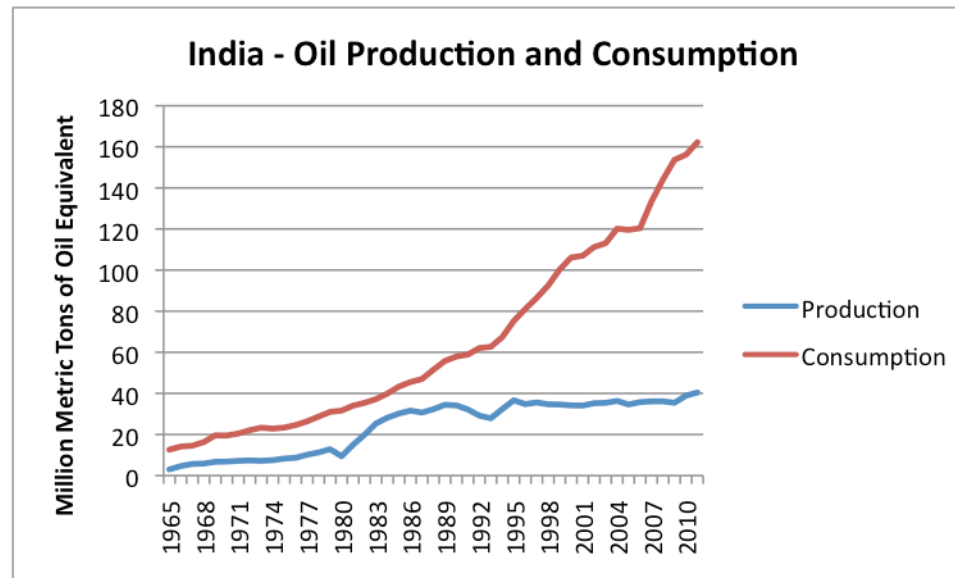
- ▶ Food prices rise with oil prices
- ▶ Funds for food subsidies dries up
- ▶ Political instability



Based on BP's 2012 Statistical Review of World Energy

India: Rapid growth, energy supply not able to keep up

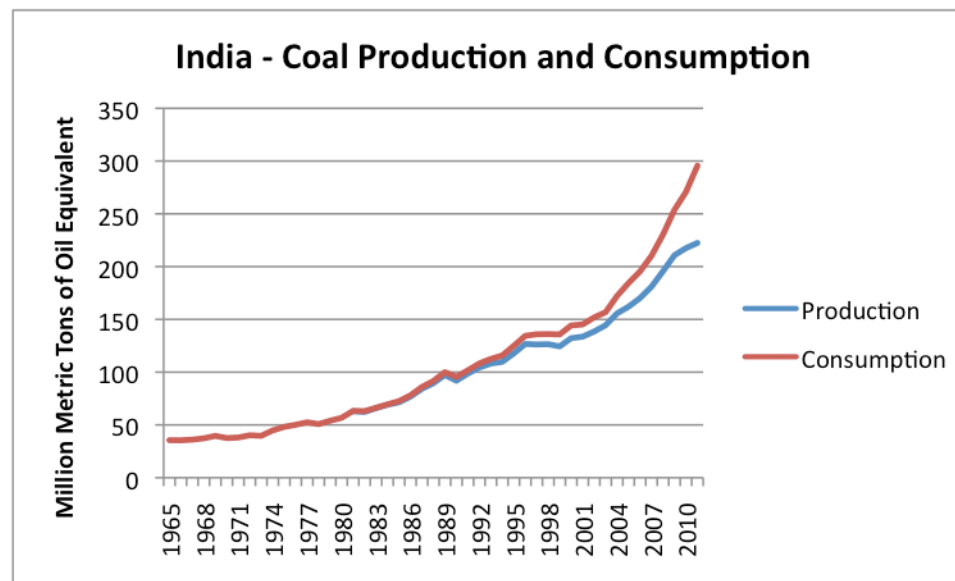
- ▶ Oil supply barely rising since 2005
- ▶ Amount used keeps growing



- ▶ Very difficult to keep up diesel subsidies
- ▶ Growing gap puts pressure on rupee

India: Coal supply also a problem

- ▶ Coal used in electricity production
- ▶ Supply not keeping up with demand; imports expensive



- ▶ Imbalance looks likely to get worse
- ▶ At some point, cuts back on electricity availability

Basic issue is that people and governments become poorer

- ▶ More unemployed
- ▶ Economic growth slows down
- ▶ Governments have big gap between income and outgo
 - ▶ Harder to pay subsidies
 - ▶ Harder to pay “entitlements” (unemployment insurance, etc.)
 - ▶ More prone to big changes

Particulars of today's problems

▶ Greece

- ▶ Financial problems in electricity and natural gas sectors
 - ▶ High solar feed in costs a problem
 - ▶ Customers applied for low rates, or can't pay rates
 - ▶ Sell off assets to outsiders (Portugal – Chinese)
- ▶ Fuel changes
 - ▶ Slashed feed-in tariffs on solar, not approving new permits
 - ▶ Moving toward lignite for electricity production
- ▶ General problems
 - ▶ More electricity theft
 - ▶ More copper wire theft
 - ▶ Petroleum fuel smuggling, adulteration, and cheating

Particulars of today's problems (cont.)

- ▶ **Civil unrest**
 - ▶ Egypt, Greece, etc.
 - ▶ Could lead to damage to energy structures
 - ▶ Nuclear a particular concern
- ▶ **Dissolution of alliances**
 - ▶ Euro breakup under discussion
 - ▶ Catalonia wants independence from Spain
- ▶ **Declining world trade**